



Erasmus University Rotterdam

Erasmus School of Economics

Accounting Auditing and Control

***Do CEO skills have an impact on CEO
compensation and firm performance?***

Student	Kristina Furdikova
Student number	428882
Supervisor	Dr. Y. Gan
Co-reader	Dr. M.H.R. Erkens
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Abstract

This thesis aims to link CEO skills to CEO compensation and firm performance. In order to do so, I divide CEO skills into general and firm-specific skills based on educational and career experience of the CEOs. The main objective is to investigate which CEO skills attract higher compensation in the market and whether those skills lead to a better firm performance. Insights about the drivers of the CEO compensation are essential in determining the right pay for the CEOs and therefore, an important topic to examine. The sample consists of 189 randomly selected CEOs from publicly quoted S&P 500 companies in years between 2013 and 2015. The results indicate significant positive relation between general CEO skills and total annual CEO compensation, however, show no significant relation between CEO skills and firm performance. The findings of this study provide evidence that general CEO skills are of bigger value to the companies when setting CEO compensation packages, although, they do not bring corresponding performance.

Key words: human capital, CEO skills, CEO compensation, firm performance

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1. Introduction

Compensation has always been a topic which attracted a lot of attention from the side of researchers as well as public eye. Especially when it comes to firm's executives, there has been an extensive research done regarding chief executive officer (CEO) compensation which has addressed concerns regarding its 30-year long increasing trend (Frydman and Jenter, 2010). However, not many studies have looked at the orientation of CEO skills as an influencer of this situation. Therefore, the aim of this master thesis is to investigate the relation between CEO skills and both CEO compensation and firm performance. It concentrates, in more detail, on the difference between general and firm-specific managerial skills and their impact on the total CEO compensation and the performance of the firm. This master thesis attempts to deliver an answer to the following research question:

RQ: Do CEO skills have an impact on compensation and firm performance?

Connecting the skills obtained by CEOs to their compensation, attempts to identify the possible reason standing behind the increased CEO pay over the years. If changes in the market are responsible for firms seeking different base of human capital in their CEOs then, generalist CEOs, who tend to be more diverse, find themselves to be more valuable for the companies and have an advantage compared to specialist CEOs in the labor market leading them to higher compensations.

The relation between CEO skills and firm performance, in the second part of the research question, is important to analyze in order to assess which CEO skill group has better impact on the profitability of the firm and whether the results are consistent with the compensation analysis. More specifically, the motivation of the thesis is to bring evidence on whether the skill group with higher CEO compensation has also more positive results regarding firm performance. Therefore, I attempt to find which skills, either general or firm-specific, are ultimately of bigger value to the firm.

It is essential to understand which CEOs run the companies and what skills they bring to the firm. Whether they are compensated accordingly and what is their added value to the shareholders. After these questions are answered, the firms have better chances in estimating the CEO value and setting the right pay for each individual which will correspond to their impact on the performance. The objective of this thesis is to contribute to the existing literature by examining the differences between CEOs who possess general managerial skills and the ones with firm-specific skills. Over the past years, financial markets have been changing,

structure of organizations has been developing, and information technologies have been progressing rapidly, which all has an impact on smooth running of the firm. It also affects the CEOs, who might need a different skillset to continue carrying the executive function in the firm effectively along with the upcoming economic evolution. It is important to investigate whether the changes in economy really affect the need for different CEO human capital.

In order to examine the research question, prior literature concentrating on human capital and CEO skills, as well as, CEO compensation and firm performance is taken into consideration. This literature serves as a source from which I include various control variables used in the regression models. The research design, described in chapter 4 of this thesis, consists of set of OLS regressions on CEO skills and compensation and firm performance. I further divide compensation on cash-based and equity-based compensation to have a better idea of what components of the compensation are more correlated with CEO human capital. In the second set of tests analyzing firm performance, I use Tobin's Q as a measurement for firm performance. In order to measure general ability of the CEOs, I follow Custódio et al. (2013) and construct an index which includes both educational and career background of CEOs. Education being represented by the area in which the degree was obtained and number of graduate degrees, and career by number of firms and corresponding industries in which CEOs have worked.

The findings of this study indicate that there is a positive relation with general CEO managerial skills and both CEO compensation and firm performance, however, only the relation with CEO compensation results significant. Further tests on CEO compensation also show that it is the equity-based part of the compensation which is responsible for the significant relation with CEO skills, unlike cash-based compensation which seems to have only weak link with the general skills of the CEOs. Therefore, I am able to confirm the first hypothesis that CEOs with more general managerial skills do receive higher compensation, when assigning them based on their previously obtained education and career experience. Consequently, the answer to the first part of the research question is yes, CEO skills do have an impact on CEO compensation. The answer to the second part of the research question, regarding the firm performance, is not that clear. I was unable to confirm the second hypothesis in this study that generalist CEOs achieve better firm performance. Although, the sign of the relation between general ability and firm performance was positive as expected, the results were insignificant, leading to a conclusion that general skills impact the firm performance, but not to such extent that the further studies could build upon.

The study adds to the existing literature on CEO human capital. First, it follows the study by Custódio et al. (2013) in which the authors construct an index based on career background of the CEOs to divide them according to the orientation of the skills which the CEOs have acquired during their previous career experience. Their findings provide evidence that the skills obtained by CEOs during their work experience have an impact on the level of their compensation, while this study adds new variables into the index based on CEO education in order to assess the skills more effectively. Therefore, I am able to add to the prior literature that each educational and career decision which has had an impact on the achieved managerial skills does make a difference in CEO compensation. Second, by measuring the firm performance of the CEOs which have been classified to either generalist or specialist group, I obtain further evidence whether there are differences in performance when CEOs with different orientation of their managerial skills are engaged in running the firm. I find that CEOs with general managerial skills do have a positive impact on firm performance, although, the difference is not significant which can be explained by competitive assignment models of CEOs. These models believe that even if there is only a small difference between the skills of the CEOs it leads to high difference between their compensations but small difference between the firms' performances (Falato et al., 2015).

Further organization of the thesis is as follows. Chapter 2 provides summary of the related prior literature which has been done on CEO skills, compensation and firm performance. This literature is later used, in chapter 3, to develop two hypotheses which test the research question of this study. In chapter 4, I summarize all independent, dependent and control variables which I use in the regression models and also provide a description of the research design and index construction. Descriptive statistics of the sample together with results of regressions are interpreted in chapter 5 and chapter 6 provides discussion with final remarks, limitations of the thesis and conclusion.

2. Literature review

In this thesis I examine the impact of two groups of CEOs, who possess different managerial skills based on the education and career experience they have obtained, on CEO compensation and further, firm performance. To better understand this topic, first, I explain different components of executive compensation with regards to performance, review the prior literature concentrating on the increasing CEO compensation and the possible reasons that have been identified to be responsible for this change. Second, I examine, how the education and career background, based on which the CEOs in this thesis are classified into the two groups, of either generalists or specialists, affects firm performance and executive compensation.

2.1. CEO compensation

2.1.1. Components of CEO compensation

CEO compensation can be divided into two components 1) cash-based compensation, including salary and bonus, and 2) equity-based compensation which consists of stock options and stock grants. Cash-based compensation is paid monthly, whereas equity-based compensation is, in most cases, paid annually based on pre-determined agreements or end-year rewards. In the thesis I run tests on both components of the CEO compensation, therefore, in this section I explain the difference between different types defined by Balsam (2002).

Cash-based compensation

- *Salary* is fixed part of the compensation, which is stated in the contract and in most cases does not depend on firm performance. Starting salary is often built based on peer groups and future expectations of newly hired CEOs.
- *Bonus* is rewarded as a result of meeting specific targets, which can be either individual, group or corporate oriented. In the most cases bonus is a result of performance achieved by a group, rather than performance of an individual employee. According to Bruce et al. (2007), bonus is not directly dependent on firm performance, the authors view this part of compensation as a representation of value that CEO brings to the firm's shareholders.

The definitions of the components of cash-based compensation above suggest that the individual performance of the CEOs does not necessarily influence the level of their compensation. Consistent with this statement is study by Shaw and Zhang (2010) which examines the effect of poor firm performance on CEO cash-based compensation. The authors find that CEO's cash-based compensation is not affected by poor performance however, there

is higher influence of the performance on the bonus part of the compensation. Finkelstein and Hambrick (1989) agree and provide explanation that weak relation between cash-based compensation and firm performance is because salaries are set at the beginning, therefore cannot correspond with performance for the upcoming year. Moreover, they test human capital as one of the main influencers of CEO cash-based compensation, although they do not find relation with salary, the relation with bonus is significant, which indicates that there are differences also between individual components within the compensation groups.

Equity-based compensation

- *Stock options* permit the executives to buy stocks at fixed price over fixed time frame. They might be valuable if share price is higher than fixed price stated by the company. In the opposite event, stock options are worthless to the holders. It all depends on the performance of the company which influences share prices.
- *Stock grants* are similar type of compensation as stock options. The difference is that with stock grants there is no exercise price, therefore, they are valuable to executives as long as the share prices are higher than zero.

Compared to cash-based compensation, the level of equity-based compensation expects certain performance from individual CEOs, which means that it is more dependent on human capital and consistent with the optimal contracting theory in this thesis. In this regard, Frye (2010) finds that equity-based compensation is increasing over time and is influenced by executive performance. Equity-based compensation serves firms in two ways 1) to reward CEOs at the end of the year for their performance during that period and 2) to motivate CEOs to increase their performance in the upcoming period (Leone et al., 2006).

2.1.2. Trends in the CEO compensation

CEO compensation has been researched in many of the previous studies which have addressed concerns regarding the increase in CEO pay over the last three decades. Frydman and Jenter (2010) divide the CEO compensation into two periods based on its similarities within the time periods. The authors describe the first period, the years up until 1970, as years with low compensations with no dramatic differences between managers and companies. They had noticed a change after the World War II, when the compensation started to increase, as well as the differences in pay across the companies after the year of 1970. Many authors provide several possible explanations, in their studies, which might be responsible for the long-lasting trend in the increasing pay of the CEOs.

The one that has been mentioned the most is the result of so called “fat cat” theory, which believes that CEOs, at the expense of shareholders, use the board of directors to increase their compensation. Studies use the term “fat cat” for CEOs who have been in the same company for years and were able to establish favorable relationships within the company. Lin et al. (2013) explain that “fat cat” firms provide higher compensation to their CEOs although it is not accompanied by superior firm performance. Their results show that CEOs, who have been in the firm longer, thus, have stronger relation with the board of directors, are more likely to influence them and receive higher compensation without achieving correspondent performance. These results suggest that CEOs hired within the company would earn higher compensation, while Murphy and Zábóník (2003) argue that this theory is not consistent with the evidence on CEO pay, which shows that externally hired CEOs receive higher compensation than CEOs promoted internally.

Second factor influencing the CEO compensation can be explained by agency theory which assumes that in the big firms, the owner and manager of the firm are not the same person, hence, conflicts of interest are very likely to arise, since both parties desire to maximize their own benefits. Agency theory defines owners as principals who provide compensation to and are dependent on the decisions of the appointed managers, also called agents (Tosi et al., 1989). Since the interests of the two parties might be misaligned, principals represented by shareholders need to assure that managers act in accordance with shareholders’ tendency to boost firm performance and therefore, shareholders build compensation packages for the managers to motivate their actions (Bloom et al., 1998). Boyd (1994) provides evidence for this argument that CEO compensation is higher for the firms with lower levels of board control, board of directors being the system which is responsible for compensation setting within the firm. However, research by Holmstrom et al. (2001) indicates that the independence of the board of directors has increased over the years, which also contradicts the argument of Boyd (1994) and other previous authors stating that the increase in the CEO compensation is the outcome of agency theory. If it was, it would be necessary for board of directors to be less independent with increasing compensation of firms’ executives.

Based on the studies mentioned above, it is evident that the research regarding increasing CEO compensation provides multiple theories with mixed results that do not fully match with the evidence on the changes in the level of CEO pay. Although, I believe that both theories partly explain the problem, in this thesis I look at it from a different perspective. Consequently, I concentrate on the market-based theory which provides an alternative

explanation regarding the 30-year long trend in the increasing CEO compensation. Under this approach, the shift in required skills of the CEOs is responsible for the changes in executive compensation. Prior literature on market-based theory, thus, optimal contracting, proposes that more talented CEOs are rewarded with higher compensation. Therefore, CEOs themselves are responsible for their compensation (Frydman and Jenter, 2010).

Evidence in the literature suggests that the compensation has mostly changed only for one type of the CEO, whose skills are more generally oriented. Custódio et al. (2013) in their study examine, whether the human capital that individual CEOs had acquired during their previous career experience has an impact on their compensation. In the first part, they provide direct evidence that current CEOs possess more general managerial skills than it was common 15 years ago, which is consistent with the literature on the compensation of the CEOs, and in the second part, the authors show that these general skills are positively correlated with the CEO compensation. Additional conclusions from this research are that generalist CEOs get higher compensation when they are replacing specialist CEOs, which also holds for the cases when they are hired externally. This study shows that CEO background plays an important role in setting the current level of their salaries.

2.2. CEO skills and firm performance

The important question to ask is: “What is the reason standing behind generalists receiving higher compensation compared to their colleagues, who are experts in one area?” In this section, I examine what makes generalist CEOs differ from the specialist ones. This part contains literature which focuses on the business behavior of the two types of CEOs which may result in the differences in their firm-related decisions and ultimately firm performance. With the following paragraphs I attempt to address the question why firms are more likely to hire either generalist or specialist CEO and which characteristics of the CEOs command higher compensation in the labor market.

2.2.1. Human capital of CEOs

Coff (2002) defines human capital as knowledge embodied in individuals. It is a representation of skills and abilities that people possess and this term is widely used in economic literature. The study by Mackey (2008) examines the influence of human capital of the CEOs on firm performance and attempts to identify the area in which the CEOs matter the most. Using variance decomposition method to estimate the CEO effect, the author comes to a conclusion that CEOs, indeed, have a significant impact explaining nearly 30% of the variance

in the performance of a firm regarding corporate profitability, which is significantly higher than both corporate and industry effects. Consistent with these results is Hitt et al. (2001) stating that the reason why firms perform differently is because the human capital within the firms is different. They declare that competitive advantage of a firm is partly based on its differences in human capital. Firms with human capital, which is difficult to duplicate, are the ones with positive returns. In this thesis, the CEOs are divided into two groups based on their human capital. I examine each CEO's human capital concentrating on their educational and career background, thus, in the next subsection I review the existing literature focusing on these two variables of the CEO past.

Career background

According to prior literature, career experience is one of the important variables which predicts the kind of decision that managers take. Study by Carpenter et al. (2001) investigates whether previous experience of the CEOs in the international projects have an impact on the firm performance. Results are consistent with authors' assumptions that, although, international career background is rare in the case of the examined CEOs, it has a positive influence on the firm performance as well as the strategy which firm chooses to follow. CEOs who have a diverse career background are more likely to be open to experience. Nadkarni et al. (2010) believe that such CEOs have a need for change, which helps them to adapt more quickly and build strategic flexibility. They provide empirical evidence in their research based in India, that career background of the CEOs affects strategic choices made by them, which has a significant impact on the firm performance. The authors expect their results to be relevant also in the U.S. because of the similarities of the five-factor model, used to predict CEO behaviors, in these countries. Attitude toward change and its implications on firm performance is influenced by CEO's functional background also in the study of Musteen et al. (2006), where CEOs with previous specialization tend to be less conservative than CEOs with more general background.

Education background

Second characteristic I use in assessing the skills of individual CEOs is their education. Education provides information about CEO's previously obtained knowledge and skills he had acquired. Managers educated in different areas might have a very diverse cognitive base and the decision to pursue one degree or another, also tells us more about what kind of people they are (Hambrick and Mason, 1984). Bhagat et al. (2010) find that newly hired CEOs with MBA degree increase firm performance in a short run, yet, the authors don't find any association

between having an MBA degree and long-term firm performance. However, Jalbert et al. (2002) find a significant relation between CEO education and firm performance measured in terms of ROA and Tobin's Q. The authors divide the CEOs into three categories 1) no degree 2) undergraduate degree 3) graduate degree and within these categories they also examine the university where the degree was obtained. Except for education having an impact on the firm performance, the results point out that the type of university the CEO graduated from also matters in regard to the chances of becoming a CEO as well as firm performance they achieve in this position. Almost one fifth of the CEOs examined in this study, who have a graduate degree, graduated from Harvard University.

2.2.2. Why generalists over specialists?

Previous part suggests that firms which hire the right people are inclined to achieve competitive success, thus, skills and abilities of the chosen employees are the crucial elements in order for firm to perform well (Pfeffer, 1994). Based on the skills, CEOs in this thesis are divided into two groups 1) generalist CEOs and 2) specialist CEOs. First one to distinguish between the terms of general and firm-specific human capital was Becker (1962) in his study about investing into the human capital. Generalist CEOs are defined as the ones with more general managerial skills and experience across various firms and industries, whereas, specialist CEOs tend to possess firm-specific skills, whose value is, according to Frydman (2005), limited only to the firm where such skills were obtained. Prior literature indicates that there has been a change in the value of skills represented by generalist and specialist CEOs, in terms of what they bring to the firm regarding their previously obtained managerial skills. Nowadays, generalists are continuously becoming more valuable to the companies.

Goodall (2012) believes that the continuing rise of generalists in the role of CEO is unfounded and argues that firms should be led by CEOs with deep knowledge of the firm's core activities. The author states that if the trend shifted and specialists became more valuable, following knowledge-based strategy, firm's performance would be more likely to improve. However, many studies are not consistent with this view and the following authors provide explanation on the increased value of generalists, over specialists, holding executive position.

Buyl et al. (2011) take a closer look at CEO characteristics as a moderating factor between Top Management Team (TMT) functional diversity and firm performance. One of the characteristics they examine is the CEO's functional background where they divide CEOs into generalists and specialists. Their assumption is that generalist CEOs are of more value to the firm when working with a diversified team because of their broader experience. They believe

that generalists are less sensitive to the biases in the team, look at the bigger picture, and are able to find knowledge within the team faster. Whereas specialist CEOs tend to work with people with similar area of expertise which may have a negative effect on smooth functioning of TMT.

Custódio et al. (2014) investigate whether CEOs with differences in their managerial abilities have different attitudes toward innovation in the companies and which type of CEOs is more likely to contribute to innovation. The authors assume that generalist CEOs are more likely to engage in innovative projects due to their experience in various fields where they built a higher tolerance to the risk which may arise from such investments. Moreover, generalists aren't faced with the same level of risk as specialists since their reputation will not be equally damaged when the project fails. In case of CEOs with general managerial ability, failure in one specific industry doesn't predict their failure in another one. The results of this working paper confirm authors' assumptions and provide evidence that generalist CEOs are more likely to follow innovation opportunities which require higher level of risk opposed to specialist CEOs. May (1995) agrees that specialist CEOs might have more trouble transferring their industry-specific skills to another area in case of failure, thus, specialists face higher risk which may cause decreased incentive to diversify.

Xuan (2009) views generalist CEOs as being more reasonable when it comes to segment investment efficiency. Generalist CEOs have gained experience in multiple segments over the time of their career and therefore, are able to evaluate investments in the firm's segments equally, unlike specialist CEOs who might be biased to the segment in which they have more experience, which could harm efficient allocation of funds in the company. The results show that companies which face CEO turnover and the new appointed CEO has more general managerial background experience improvements in investment efficiency. The author also examines market reaction to company's decision to hire new CEO based on their experience. The cumulative abnormal returns increase if the new appointed CEO is generalist.

All the arguments in favor of generalist CEOs stated above are essential when firms aspire well-driven organization which may provide an explanation why there has been a change in the managerial skills the organizations seek when appointing new manager to the role of CEO. These are also explanations for firms' incentives to give higher compensation to their CEOs if they possess firm-valuable skills, which the firm will benefit from in the future.

3. Hypotheses development

The first hypothesis of this thesis relates to skills obtained by CEOs and their attributable compensation. As I discussed in the literature review, there has been a change in the level of CEO compensation over the past 30 years (Frydman and Jenter, 2010). Prior literature provides alternative explanations for this change including deeply discussed agency theory. However, I base my hypothesis on the optimal contracting view, which provides a different perspective on the topic of CEO compensation. I focus on the skills of the CEOs as a determinant of their compensation. According to optimal contracting theory the objective of the board of directors when setting a compensation for the new appointed managers is to increase the value of the firm resulting in a higher profit for firm's shareholders. In this scenario, CEO compensation is supposed to be set through optimal contracting and motivate managers to increase the firm performance (Edmans and Gabaix, 2009). According to optimal contracting theory, the compensation of individual employees should be a result of competition in the market. Therefore, the CEOs with higher pay should possess higher managerial ability (Frydman, Jenter, 2010). In other words, managers that are perceived to have achieved more relevant skills for the company are ultimately offered higher compensation under the firm's assumption that they will achieve better results compared to their competitors in the labor market resulting from their human capital. In this regard, Frye (2010) points out that the structure of compensation has also changed over the years which could be influenced by shifting attitudes of companies toward differences in CEO skills. The study finds an increase in equity-based compensation, which supports the optimal contracting view that firms offer compensation plans rewarded upon performance to attract the employees with greatest human capital.

Falato et al. (2015) dive further into the compensation topic by assigning each CEO from their sample, which consists of the CEOs from S&P 1500 firms between 1993 and 2005, credentials based on which the impact on their compensation is examined. The credentials represent a combination of educational, professional and reputational records of the CEOs. Their results show that, indeed, the most talented CEOs, according to the assigned credentials, receive the highest compensation.

Moreover, Harris and Helfat (1997) observe the relation between compensation and three types of skills of CEOs who have been promoted 1) internally 2) externally with the same industry experience and 3) externally without relevant industry experience. They find that the firms value the CEOs that have been hired outside the company and don't possess any industry-specific experience the most. Such CEOs earn 36% more in initial salary and bonus than CEOs

promoted within the firm. Similarly, Murphy and Zájbojník (2004) point out that the CEOs with general managerial skills are being viewed by firms as the ones with higher importance compared to the CEOs with firm-specific skills. Prior literature by Custódio et al. (2013) also finds a positive relation between generalist CEOs and the compensation they receive. In this study CEOs are classified based on their career background and compensation paid to generalists is measured to be almost 20% higher than the compensation paid to CEOs with firm-specific skills.

Regarding these statements, I predict that the compensation will be higher for the CEOs with general skills, since it is assumed that they have the higher ability in running the company. In accordance with optimal contracting theory, I form the following hypothesis to capture the relation between CEO skills and their compensation:

H1: CEOs with general managerial skills receive higher compensation.

The second hypothesis I present in this thesis examines the relation between CEO skills and their impact on the firm performance. In the previous hypotheses I assume that generalists receive higher compensation than specialist CEOs based on optimal contracting theory that higher compensation is rewarded to the more talented CEOs, and in the second hypothesis I test whether the reason of the changes in compensation between the two CEO groups is also explained by firm performance.

In connection with my attempt, Murphy and Zájbojník (2004) conclude that to perform the CEO job, the general managerial skills are of bigger value due to the significant progress in economics, accounting and other relevant fields, which in the past years became essential to execute a managing function. Moreover, improvements in information technology over the last years resulted in a decreased need for a CEO with specific knowledge about the firm. Most of the information is now accessible through easy computer commands that are available to CEOs at any time, which ultimately lowers the added value of the specialist CEOs. The view of Frydman (2005) is consistent with Murphy and Zájbojník (2004) in terms of increased importance of general managerial skills due to the development in communication technology. In addition, the author views the shift in required CEO skills as a broader concept happening because of the inevitable changes in economy. If companies want to survive in the market, they constantly need to improve, follow economic trends, and invest into innovation. The available evidence seems to suggest that generalist CEOs are more willing to face the risk involved in

decision making regarding innovation of the companies (Custódio et al., 2014) as well as invest the resources that are available to the companies more efficiently (Xuan, 2009).

If generalists are perceived to be more beneficial for the firms and, thus its shareholders, I expect, that the CEOs identified with more general managerial ability should have better impact on the firm performance. The CEOs with higher ability should lead firm to a better performance. Based on these assumptions I form my second hypotheses as follows:

H2: Generalist CEOs achieve better firm performance.

4. Methodology

I test the hypotheses through empirical archival research, which evaluates the relation between the variables discussed in the following section. All the calculations of the dependent, independent and control variables are attached in Table 2.

4.1. Independent variable

To measure the independent construct in this thesis, CEO skills, based on the educational and career background of the CEOs, I create one-dimensional index. Educational background is examined by the field in which the degree was obtained as well as the number of degrees held by the CEO. Based on the combination of that information I am able to assess the orientation of managerial skills of CEOs with regards to their education. CEOs with MBA or law degrees are identified to have more general-oriented education compared to CEOs with science and other degrees. I examine the graduate degrees only, without differentiating undergraduate degrees of CEOs due to unavailability of information. This variable has potential weaknesses, since the degree itself doesn't always represent the ability of CEOs (Gottesman et al., 2006) and the ones with, for example, MBA degree might gain firm-specific managerial skills and vice versa. However, I believe that by adding career background variables, represented by number of industries and firms in which the current CEO has been able to gain experience, will add value to the final index and enhance its reliability by taking into account both education and career variables in determining the skill-orientation of CEOs. I construct the General Ability Index (GAI) following the steps in Custódio et al. (2013) and implementing my own educational variables into the index. CEOs with index which is higher than the median are classified into generalist and with lower index into specialist group.

4.2. Dependent variables

4.2.1. CEO compensation

CEO pay is extracted from EXECUCOMP which represents CEO compensation in thousands of dollars per year and includes salary, bonus, value of restricted stock granted, value of options granted, long-term incentive payout and other compensation. I perform the analysis on total compensation and also divide these components into cash-based and equity-based compensation in order to measure the effect of CEO skills on the CEO compensation more accurately. The distinction between the various types of compensation is summarized in the first section of the literature review. I calculate cash-based compensation as a sum of annual salary and bonus paid to the CEOs, and equity-based compensation represents the difference

between total annual CEO compensation and cash-based compensation for the year. I examine the data on CEO compensation for three consecutive years between 2013 and 2015. In the regression analysis, I use the log value for all types of compensation examined in this thesis to partially correct the normal distribution and for interpretation purposes.

4.2.2. Firm performance

The dependent variable, firm performance, is measured using Tobin's Q. I have chosen this measure because it is widely used proxy in the prior literature, although it has some limitations, it is seen as a reliable market-based measure for firm performance (Miller et al., 2015; Frye, 2004). Wolfe (2005) state that Tobin's Q effectively shows the value of a firm from perspective of an investor and Lang et al. (1989) believe that Tobin's Q indicates whether management handled the existing firm's assets properly. The data I need are available through COMPUSTAT and Tobin's Q is calculated as follows:

$$Tobin's\ Q = \frac{Total\ assets + Equity\ market\ value - Equity\ book\ value}{Total\ assets}$$

4.3. Control variables

In this thesis I control for several variables which have been identified in prior literature as possible influencers of my dependent variables, CEO compensation and firm performance. Control variables in this study can be divided into 1) CEO-level and 2) Firm-level characteristics. Based on the evidence from previous academic articles I hold the following variables constant.

4.3.1. CEO-level characteristics

IVY League is a dummy educational variable for degrees obtained from Brown, Columbia, Cornell, Dartmouth, Harvard, Pennsylvania, Princeton, and Yale which are considered to be Ivy League universities. Miller et al. (2015) evaluated these schools with regards to firm performance. The study shows that firms' average Tobin's Q is higher when CEO obtained education from above listed prestige universities. This may be the case due to higher motivation and requirements on Ivy League applicants, as well as, the quality of education offered, once they are accepted to pursue their studies. Gottesman et al. (2006) find that compensation of CEOs is also influenced by the type of university the CEOs graduated from. CEOs who received their MBA or law diploma from Ivy League school tend to earn higher compensation. Consistent with this evidence are the findings in the study by Judge et al.

(1995), where CEOs with degree from Ivy League university received \$30,929 more in compensation than their colleagues without such education.

Tenure represents years during which CEO has held an executive function within the company for which I examine the data. Jalbert et al. (2002) find significant positive relation between the years of the CEO tenure and compensation, as well as, in the case of firm performance measured by ROA, although the impact on firm's Tobin's Q is significantly negative. CEOs whose tenure is higher have stronger relation with the company and might also have bigger opportunities to manage their compensation, which is not always correspondent to the firm performance, therefore I control for this variable in both regression models. The authors also examine *Age* which is a variable to control for the age of individual CEOs. CEO age, in the study by Jalbert et al. (2002) is positively associated with compensation and negatively with firm performance.

PreviousCEO is a dummy variable which takes a value of 1 if the CEO has previously held a CEO position and 0 otherwise, CEOs with prior experience are likely to have an influence on earned salary and achieved firm performance. I also control for *First-year CEOs* since their first annual compensation might not represent their future years' compensations due to different starting dates (Balsam, 1998). *CEOfounder* represents CEOs who besides holding an executive function are also founders of the company, which might have an impact on their compensation.

According to the results of Khan and Vieito (2013), *Gender* dummy variable should also be included when examining CEO compensation and firm performance. Their study finds that firm performance differs when male and female are appointed to the function of the firm's CEO. The authors suggest that female CEOs have less incentives to take risky actions which results in different performance.

4.3.2. Firm-level characteristics

Since different industries face different norms and regulations which have an effect on CEO compensation (Rose and Shepard, 1994), I control for *Firm industry* by dividing the sample into industries based on their SIC codes according to the classification presented in Table 1. I take into consideration the first two digits of SIC codes when assigning corresponding industries to the firms and create 10 different industry dummy variables. *Firm size* is also identified as a variable which impacts CEO compensation and firm performance on a firm level (Custódio et al., 2013). Core et al. (1999) find a positive relation between firm size and CEO compensation, since bigger firms tend to provide higher compensation for their CEOs in order

to assure that they hire the most talented CEOs. Moreover, Hansen and Wernerfelt (1989) identify firm size, which I measure as logarithm of total assets owned by a company, to have an impact on the firm performance through diversification.

Table 1 SIC code classification

<i>SIC Code</i>	<i>Classification</i>
0100-0999	Agriculture, Forestry and Fishing
1000-1499	Mining
1500-1799	Construction
2000-3999	Manufacturing
4000-4999	Transportation, Communications, Electric, Gas and Sanitary service
5000-5199	Wholesale Trade
5200-5999	Retail Trade
6000-6799	Finance, Insurance and Real Estate
7000-8999	Services
9100-9729	Public Administration

According to Bryan et al. (2000) *Firm leverage* is expected to influence CEO compensation and make transfers within cash and equity-based compensations, therefore I include it as my control variable and calculate the leverage as total debt divided by total equity of the firm. CEOs are as well influenced by stock prices when they take investment decisions (Bizjak et al., 1993) which has an impact on firm performance and results in differences in compensation which is partially dependent on stock returns, consequently, I use control variable *StockReturn* in the analysis.

Table 2 Variable definitions

<i>Variable</i>	<i>Description</i>
CEO skills (General Ability Index)	Independent variable, index constructed from CEO general degree, number of degrees, number of firms CEO has worked in, and number of industries (BoardEx)
<ul style="list-style-type: none"> • General Degree 	Takes value of 1 if CEO has an MBA or law degree (BoardEx)
<ul style="list-style-type: none"> • Graduate Degrees 	Represents the number of graduate degrees CEO has achieved (BoardEx)
<ul style="list-style-type: none"> • Industries 	Represents the number of industries CEO has worked in (BoardEx, Orbis)
<ul style="list-style-type: none"> • Firms 	Represents the number of firms CEO has worked at (BoardEx)
Total compensation	Dependent variable presented as logarithm of thousands of dollars, includes salary, bonus, value of restricted stock granted, value of options granted, long-term incentive payout and other compensation (EXECUCOMP)

Table 2 (continued)

Cash-based compensation	Presented in logarithm of thousands of dollars, includes salary and bonus (EXECUCOMP)
Equity-based compensation	Presented in logarithm of thousands of dollars, calculated as Total CEO compensation – Cash-based compensation (EXECUCOMP)
Tobin's Q	Dependent variable calculated as (Total Assets + Equity Market Value – Equity Book Value)/Total Assets (COMPUSTAT)
IVY League	Control dummy variable, takes value of 1 if CEO attended one of the IVY league universities (Brown, Columbia, Cornell, Dartmouth, Harvard, Pennsylvania, Princeton, and Yale) (BoardEx)
Tenure	Control variable, represents the number of years as a CEO in the examined firm (EXECUCOMP)
Age	Control variable, represents current age of the CEO (EXECUCOMP)
CEO position	Control dummy variable, takes value of 1 if CEO has held CEO position before (BoardEx)
First-year CEO	Control dummy variable, takes value of 1 for the first year CEOs (EXECUCOMP)
Founder CEO	Control dummy variable, takes value of 1 if CEO is also founder of the firm where he is currently a CEO (BoardEx)
CEO gender	Control dummy variable, takes value of 1 if CEO is a male (EXECUCOMP)
Firm Industry	Control variable, industries are identified based on the first two digits of firm's SIC code (COMPUSTAT)
Firm Size	Control variable, calculated as logarithm of total assets owned by a firm (COMPUSTAT)
Stock Return	Control variable, calculated as (Ending Stock Price – Initial Stock Price + Dividends)/Initial Stock Price (COMPUSTAT)

Note: This table includes description and calculation of all independent, dependent and control variables used in this thesis. Source from where I extracted the individual financial information is stated in the parenthesis.

4.4. Sample

My sample consists of 189 randomly selected CEOs for years from 2013 until 2015. CEOs selected into the sample have held the CEO position in one of the Standard & Poor's 500 firms. The main database I use is EXECUCOMP, where I get the data on CEO compensation, which I later match with COMPUSTAT to generate variables. I use BoardEx to manually match the educational background of selected CEOs to other CEO and firm-level characteristics. In EXECUCOMP and COMPUSTAT, I search the entire universe for the examined years to obtain the data on CEO compensation and firm performance, keeping the firms with fiscal year end in December and with date of CEO appointment available. This pre-selection results in 2436 observations from which I randomly select 200 unique CEO observations, which are matched

with hand-collected data from BoardEx. In BoardEx I get the data on all previous positions of the CEOs as well as companies where they have worked. To find out the degree of their career specialization I search for SIC codes of every company where CEOs have worked in Osiris, which I incorporate into the final managerial ability index. I don't find a match in BoardEx for 5 CEOs. Moreover, I check for duplicates within the sample and as a result delete 6 duplicate observations. Therefore, my final sample consists of 189 unique CEO observations between 2013 and 2015.

Previous studies which analyzed CEO compensation and firm performance based on CEO skills, in general, used bigger samples of 4451 different CEOs (Custódio et al., 2013), 2195 CEO succession candidates in Falato et al. (2015) and 305 CEO successors in the study by Harris and Helfat (1997), however they led to similar results in terms of descriptive statistics of the sample, which I discuss in the following chapter.

Analyzing the entire population of the CEOs would lead to lower possibility of biased results, although, in the case of this thesis, when there is need for hand-collection of the information about CEO's educational and career background, it would not be manageable in a timely manner. To reduce the uncertainty about the representativeness of my sample due to its size, I perform t-tests on my dependent variables CEO compensation and Tobin's Q. I set the mean level based on the mean of the original sample of the entire universe and the results show that my randomly selected sample is representative for both dependent variables at significant level $p < 0.05$. In the next step, I run Shapiro-Wilk normality test which shows that my data is not normally distributed. I partially correct the distribution by winsorizing all variables in the sample at 1st and 99th percentile values.

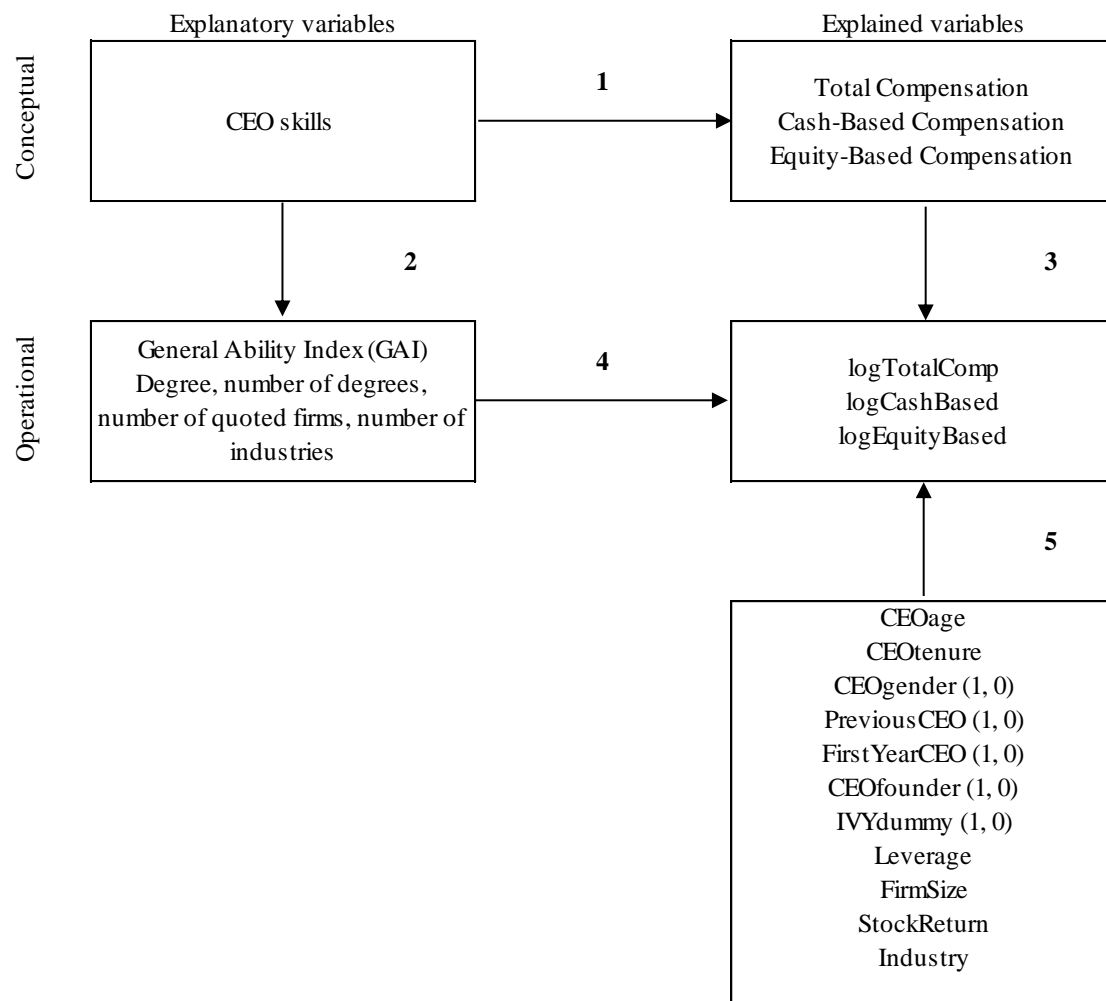
4.5. Research design

I test the first hypothesis through set of OLS regressions which examine the relation between CEO skills and CEO total annual compensation. In the equation TotalComp represents the dependent variable, logarithm of total annual CEO compensation of each firm i in year t and GAI represents the independent variable, general orientation of CEO skills in firm i and year t . ε_{it} represents the error term. According to the first hypothesis, I expect to find positive relation between CEO compensation and general CEO skills, therefore, to confirm it, the model needs to results with positive and significant GAI coefficient. In addition, to obtain more informative results, I run the same OLS regression on cash-based and equity-based annual CEO

compensation. Libby boxes attributable to the first hypothesis and first set of regression models are presented below in Table 3.

$$\begin{aligned} TotalComp_{it} = & \alpha + \beta GAI_{it} + \gamma_1 CEOage_{it} + \gamma_2 CEOtenure_{it} + \gamma_2 PreviousCEO_{it} \\ & + \gamma_2 FirstYearCEO_{it} + \gamma_2 CEOfounder_{it} + \gamma_2 CEOgender_{it} \\ & + \gamma_2 IVYleague_{it} + \gamma_2 Leverage_{it} + \gamma_2 FirmSize_{it} + \gamma_2 StockReturn_{it} + \varepsilon_{it} \end{aligned}$$

Table 3 Libby boxes: Hypothesis 1

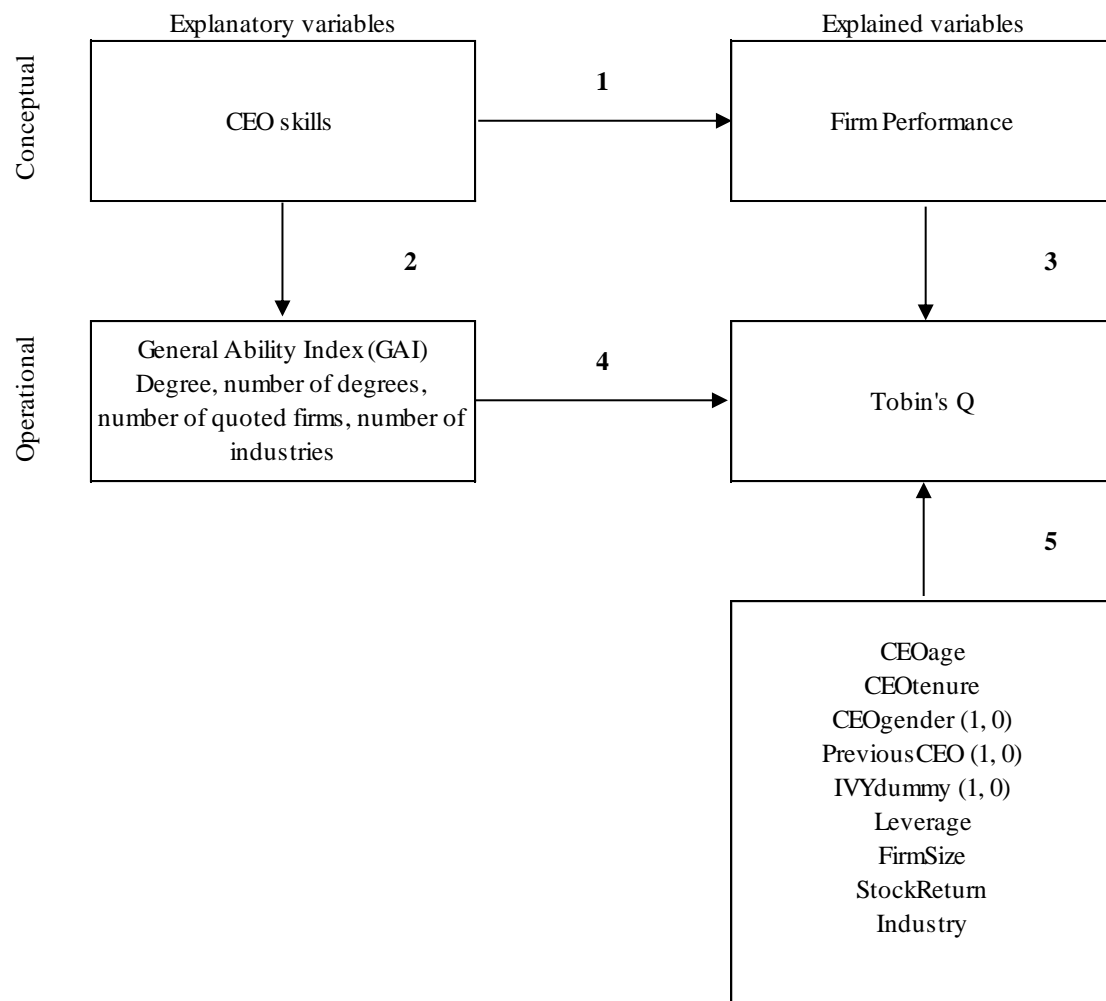


The second hypothesis is tested through similar regression model, where Tobin's Q represents dependent variable, firm performance for each firm i in year t and GAI, similarly as in the first hypothesis represents generality of CEO skills in firm i in year t . Repeatedly, ε_{it} represents the error term. To confirm the second hypothesis, Tobin's Q coefficient has to result positive and significant at 0.05 level. For better visual representation of the regression model

with all the variables used in them, I include Libby boxes regarding the second hypothesis in Table 4.

$$\begin{aligned} TobinsQ_{it} = & \alpha + \beta GAI_{it} + \gamma_1 CEOage_{it} + \gamma_2 CEOtenure_{it} + \gamma_2 PreviousCEO_{it} \\ & + \gamma_2 CEOgender_{it} + \gamma_2 IVYleague_{it} + \gamma_2 Leverage_{it} \\ & + \gamma_2 FirmSize_{it} + \gamma_2 StockReturn_{it} + \varepsilon_{it} \end{aligned}$$

Table 4 Libby boxes: Hypothesis 2



4.5.1. Index construction

GAI index which is my main independent variable for both models is constructed in Stata using factor command. The index represents four different variables which indicate the orientation of the managerial skills from both educational and career perspective, each represented by two variables.

First variable I use is *General Degree*, which takes on value of 1 if CEO has obtained either MBA or law degree, and 0 if CEO has not graduated with either general degree or has

not completed any graduate program. Second variable is *Graduate Degrees*, which represents the number of graduate degrees that CEO has obtained. The more graduate degrees CEO has the broader his area of expertise gets and therefore, I conclude that his skills are becoming more generally oriented. The view of a CEO with either MBA and law degree, or degree from another area, becomes more complex. I search my sample in BoardEx where I find information on both of the educational variables, to which I assign corresponding values in Stata.

Third variable in the index is *Industries*, which indicates in how many industries the CEO has had the opportunity to gain experience. The last variable included in the index is *Firms*, which represents the number of firms where CEOs have worked. In both career variables, the more industries and firms, the more general managerial skills the CEOs have obtained. Similarly, to the education, if CEO has had the opportunity to switch within different industries and firms, his approach changes, since he views the situations from different perspectives. For the career variables I search the BoardEx to find the companies in the career history of the examined CEOs and I look each of them up in Orbis to obtain industrial SIC code in order to categorize the firms into industries based on the first two digits of firm's SIC Code. For *Industries* and *Firms*, I use only quoted firms, since I was unable to find many of the private companies on Orbis and therefore, I could not identify the industry where they belong and include them in the analysis, which would make the results biased. The index construction in Stata results in two factors which I join together in order to finalize the General Ability Index that I later use in the regression models.

5. Results

5.1. Descriptive statistics

Panel A in Table 5 provides summary statistics regarding CEO-level characteristics of the entire sample which indicate that the average age of CEOs in the sample is 55 years with average tenure of 7 years. I also include CEOs who have just began their tenure in the firm, for which I control using dummy variable *FirstYear*, the total number of such CEOs in the sample is 13. There are also 13 CEOs who are, additionally to being CEOs, founders of the firm and for almost 27.5% the current CEO position is not the first in their career history. Majority of the examined CEOs are males, females being represented by 7%, which is representative to the real situation in firms, where mostly male executives hold CEO positions, according to Catalyst.org (2016), only 4.6% from current CEO positions at S&P 500 firms are held by women.

Table 5 Descriptive statistics

<i>Panel A: CEO-LEVEL CHARACTERISTICS</i>						
Variable	Observations	Mean	Std. deviation	Median	Min.	Max.
Age	189	55.815	7.092	55	36	75
Tenure	189	7.228	6.674	5	0	27
FirstYear	189	0.074	0.263	0	0	1
PreviousCEO	189	0.275	0.448	0	0	1
CEOfounder	189	0.079	0.271	0	0	1
Gender	189	0.937	0.244	1	0	1
IVY League	189	0.153	0.361	0	0	1
CPA	189	0.106	0.308	0	0	1
GenDegree	189	0.423	0.495	0	0	1
<i>MBA</i>	189	0.328	0.471	0	0	1
<i>Law</i>	189	0.106	0.308	0	0	1
GraduateDegrees	189	0.720	0.715	1	0	3
Industries	189	2.026	1.160	2	1	7
Firms	189	2.561	1.517	2	1	8
GAI	189	-0.0001	0.707	-0.0599	-0.931	2.255

<i>Panel B: CEO COMPENSATION</i>						
Variable	Observations	Mean	Std. deviation	Median	Min.	Max.
TotalCompensation	189	6865.854	5858.889	5242.638	500	35890.67
Cash-based	189	1051.78	762.5264	910.625	344.167	6188.59
Equity-based	189	5746.346	5198.306	4109.457	0	25890.26

<i>Panel C: FIRM-LEVEL CHARACTERISTICS</i>						
Variable	Observations	Mean	Std. deviation	Median	Min.	Max.
Tobin's Q	189	2.045	1.518	1.516	0.753	9.555
Leverage	189	0.252	0.202	0.244	0	0.989
FirmSize	189	8.338	1.837	8.426	3.766	12.805
StockReturn	189	0.355	1.190	0.135	-0.741	10.804

From the educational perspective, 15% of the CEOs who obtained graduate degree, have an IVY League education and nearly 43% have a general degree, which I consider to be either law or MBA degree. CEOs who fall into the group of generalists have all obtained a general degree and 1.13 graduate degrees on average, in comparison, specialist CEOs have obtained on average 0.20 graduate degrees. CPA qualification is present in 10% of the sample. The summary statistics show that average GAI index, which is based on educational and career background and divides CEOs into two groups in this thesis is -0.0001 . Considering its median of -0.0599 , it is clear that the majority of CEOs belong to the category of generalist CEOs, precisely 55.5%. Generalists have career experience in around three quoted firms and more than two different industries on average, whereas, specialists have worked on average in less than two quoted firms within the same industry.

Table 6 Difference in descriptive statistics between Generalists and Specialists

<i>Panel A: CEO-LEVEL CHARACTERISTICS</i>				
	Generalists	Specialists	Difference	Test statistics
Age	55.152	56.642	- 1.490	0.043**
Tenure	7.200	7.262	- 0.062	0.929
FirstYear	0.038	0.119	- 0.081	0.004***
PreviousCEO	0.305	0.238	0.067	0.147
CEOfounder	0.086	0.071	0.015	0.608
Gender	0.952	0.917	0.035	0.163
IVY League	0.257	0.024	0.233	0.000***
CPA	0.095	0.119	- 0.024	0.457
GenDegree	0.781	0	0.781	0.000***
GraduateDegrees	1.133	0.202	0.931	0.000***
Industries	2.457	1.488	0.969	0.000***
Firms	3.210	1.750	1.460	0.000***
GAI	0.512	- 0.641	- 1.153	0.000***
<i>Panel B: CEO COMPENSATION</i>				
TotalCompensation	7341.916	6270.777	1071.139	0.077*
Cash-based	1019.821	1091.729	- 71.908	0.369
Equity-based	6236.488	5133.669	1102.819	0.040**
<i>Panel C: FIRM-LEVEL CHARACTERISTICS</i>				
Tobin's Q	2.162	1.898	0.264	0.088**
Leverage	0.263	0.238	0.025	0.234
FirmSize	8.369	8.3	0.069	0.713
StockReturn	0.454	0.230	0.224	0.056**

Panel B of Table 5 shows that average annual compensation of the CEOs which includes salary, bonus, value of restricted stock granted, value of options granted, long-term incentive payout and other compensation is 6865.854 thousand dollars. In comparison, Panel B of Table 5 presents the differences in compensation between generalist and specialist CEOs. For the specialist group the average is a little underneath the overall average at 6270.777 thousand

dollars and generalists reach over the total average at 7341.916 thousand dollars. Table 6 shows that the difference in means between total compensation of generalists and specialists is significant at 10% level. I divide the compensation into cash and equity-based compensation for both CEO groups and results show that average cash-based compensation, salary and bonus, is higher for specialist group while generalists receive higher equity-based compensation. I compare the compensation with previous studies in order to examine whether CEO compensation has grown over the recent years. Custódio et al. (2013) recorded the average total annual compensation of 4519 thousand dollars with the last examined year being 2007 and Falato et al. (2015) at 5.2 million dollars, which is in both cases lower than the average compensation over the years 2013 and 2015 in this thesis. This indicates that the trend is still current and CEO total annual compensation keeps increasing from year to year.

Descriptive statistics of firm-level characteristics in Panel C of Table 5 indicate that average leverage is 25.2% with Tobin's Q equal to 2.045 and stock return at 0.35. Although, the sample of Custódio et al. (2013) is significantly bigger, with 4451 different CEOs, their CEO-level as well as firm-level characteristics are comparable to the ones from this thesis. They find average leverage of 23% in the examined firms and average Tobin's Q equals to 1.996 between the years of 1993 and 2007. Custódio et al. (2013) do not examine the firm size as logarithm of total assets, however Falato et al. (2015) do and the average firm size in their sample equals to 7.4 which is less than 8.3 in this study. The authors based their research on S&P 1500 firms over 1993-2005 which may have caused the difference in size statistics.

5.2. Correlation matrix

Before running the regressions, I perform the Pearson's correlation test on variables included in both models. The Pearson correlation coefficient for logTotalComp and GAI, which are dependent and independent variables of the model, has a p-value of 0.014 which indicates that the correlation is significant, although not that strong, considering its r-value of 0.178. From the control variables, Leverage, Firm Size, Stock Return, CEO Tenure, and Previous CEO, all have significant p-values regarding correlation to logTotalComp.

The correlation matrix for the second dependent variable Tobin's Q in relation to GAI shows that the correlation is insignificant. However, CEO Tenure, Previous CEO and Firm Size conclude to be significant in correlation to Tobin's Q.

5.3. Regressions

First regression I run on CEO total compensation is without including control variables in the model. By including only, the independent variable GAI, the Panel A of Table 7 shows that adjusted R-square of the first model is 0.0266, whereas, when control variables are included in the second regression, the adjusted R-square increases up to 0.4881 presented in Panel B of Table 7. This suggests that CEO-level and firm-level characteristics explain 46.15% of the model and 2.66% is explained by CEO skills. The relation between CEO total compensation and general managerial skills, represented by general ability index, is significant and positive in both analyses, at 5 and 10 percent level, respectively. General ability coefficient indicates that CEOs with more general managerial skills receive higher compensation than CEOs with firm-specific skills. Panel B of Table 7 shows that increase by 1 in GAI's standard deviation leads to increased total annual CEO compensation by 14%. Control variables *Age* and *CEO founder* are statistically significant in the model and both have a negative effect on total compensation. *Firm Size* is positive and significant at 1% level, which was expected, since it is assumed that bigger firms are able to provide higher compensation to its CEOs. Stock return, on the other side, is also significant but has a negative impact on compensation. From the variables controlling for firm's industry only Finance, Insurance and Real Estate industry, identified based on the first two digits of firm's SIC code, results significant and positive.

I repeat the regressions, I run on total compensation, on both cash-based and equity-based compensations of the CEOs to analyze which type of compensation is more dependent on CEO skills. The relation between cash-based compensation and CEO skills does not result significant neither without nor with control variables included in the model. Its economic significance is also very low with 1 standard deviation increase resulting in less than 1% increase of cash-based compensation. Control variables Firm size and Previous CEO are the only variables in the model found to be significant in this relation. These results suggest that cash-based compensation is set disregarded of CEO skills, although, previous CEO experience does play a significant role and bigger firms are able to set higher cash-based compensation for their CEOs. In contrast, the results of both analyses show that general managerial skills have a significant and positive effect on equity-based compensation of the CEOs. The results of this analysis are similar to the analysis of total compensation, which indicates that significant relation between total compensation and CEO skills is mainly driven by the equity-based part of the CEO compensation. The coefficient estimates for equity-based compensation are more economically statistical than for total compensation. 1 increase in standard deviation of GAI

results in 24% increase of equity-based compensation. Firm size, Stock return, and CEO founder are similarly significant in this model, whereas, CEO age is not significant, meaning that CEO age does not decrease equity-based compensation, unlike in the case of total and cash-based compensation.

Table 7 Regressions on CEO skills and CEO compensation

<i>Panel A: REGRESSIONS WITHOUT CONTROL VARIABLES</i>						
Variable	TOTAL		CASH-BASED		EQUITY-BASED	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
GAI	0.226	0.014***	0.054	0.267	0.349	0.014***
Probability	0.014		0.268		0.014	
Adj./Pseudo R2	0.027		0.001		0.027	
Observations	189		189		187	
<i>Panel B: REGRESSIONS WITH CONTROL VARIABLES</i>						
Variable	TOTAL		CASH-BASED		EQUITY-BASED	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
GAI	0.14	0.068*	0.001	0.979	0.236	0.067*
Age	-0.015	0.055*	0.004	0.478	-0.018	0.172
Tenure	0.009	0.325	0.006	0.309	0.008	0.603
Gender	0.137	0.493	-0.003	0.980	0.255	0.446
FirstYear	0.214	0.283	0.024	0.853	0.417	0.215
PreviousCEO	0.139	0.240	0.144	0.060*	0.114	0.568
CEOfounder	-0.417	0.036**	0.043	0.735	-0.761	0.030**
IVY League	0.235	0.102	0.043	0.645	0.386	0.109
Leverage	0.292	0.247	0.218	0.181	0.224	0.605
FirmSize	0.326	0.000***	0.134	0.000***	0.446	0.000***
StockReturn	-0.165	0.000***	-0.029	0.282	-0.363	0.000***
<i>IndustryCode</i>						
Agriculture, Forestry and Fishing	0.293	0.704	-0.167	0.737	0.548	0.672
Mining	-0.361	0.370	0.064	0.807	-0.746	0.269
Construction	0.114	0.797	0.300	0.296	-0.091	0.903
Manufacturing	0.036	0.916	0.633	0.776	-0.244	0.673
Transportation, Communications, Electric, Gas and Sanitary service	-0.294	0.421	0.101	0.670	-0.975	0.112
Retail Trade	0.067	0.873	0.036	0.895	0.029	0.967
Finance, Insurance and Real Estate	-0.601	0.087*	-0.116	0.607	-0.977	0.097*
Services	0.154	0.665	0.021	0.926	0.013	0.982
Probability	0.000		0.000		0.000	
Adj./Pseudo R2	0.488		0.227		0.383	
Observations	189		189		187	

Note: OLS regressions are run with log of Total Compensation, Cash-Based Compensation and Equity-Based Compensation as dependent variables. General Ability Index (GAI) is the main independent variable, the other mentioned variables are control variables. *p<0.10, **p<0.05, ***p<0.01 significance levels are at 10%, 5%, and 1%, respectively. Panel A includes the regressions without including control variables in the model and Panel B represents the results after adding the control variables into the model.

The results of the first set of regressions on CEO compensation confirm the hypothesis that CEOs with more general managerial skills receive higher compensation. Through dividing the compensation, I can be more specific and confirm, that CEOs whose skills are more generally oriented get higher equity-based compensation, whereas, cash-based compensation is less dependent on orientation of specific managerial skills of appointed CEOs. When testing the normality of the residuals I use the Shapiro-Wilk test, which tests whether the residuals are normally distributed. I find a W of 0.99146 for the residuals, where a higher W indicates normality. The sample has a p-value of 0.329 which is above the 0.05 threshold, therefore, I cannot reject the null hypothesis that sample has a normal distribution. I also perform multicollinearity tests after all regressions on CEO compensation in order to ensure that the predictors in this thesis are not highly correlated. All dependent variables, total annual compensation, cash and equity-based compensation get almost identical results with mean of variance inflation factor of 3.15, 3.16 and 3.15, respectively.

The second set of regressions examines the relation between CEO skills and firm performance. When I run the regression without control variables, the adjusted r-squared is negative at 0.002 in Panel A of Table 8. After adding control variables, it explains 23.10% of the relation. However, the relation between the independent variable, firm performance, measured through Tobin's Q and CEO skills remains positive, it is insignificant with p-value of 0.466 in Panel B of Table 8. The economic significance is also quite weak since 1 increase in standard deviation of GAI improves firm performance by 0.11 in terms of Tobin's Q. Although the change is positive, with average Tobin's Q in the sample being 2.045, it is a slight difference.

Table 8 Regression on CEO skills and Tobin's Q

<i>Panel A: REGRESSIONS WITHOUT CONTROL VARIABLES</i>			
			TOBIN'S Q
<i>Variable</i>	<i>Coefficient</i>	<i>p-value</i>	
GAI	0.120	0.446	
Probability		0.446	
Adj./Pseudo R2		-0.002	
Observations		189	
<i>Panel B: REGRESSIONS WITH CONTROL VARIABLES</i>			
			TOBIN'S Q
<i>Variable</i>	<i>Coefficient</i>	<i>p-value</i>	
GAI	0.114	0.466	
Age	-0.035	0.029***	
Tenure	0.048	0.009***	
Gender	0.576	0.163	
PreviousCEO	-0.510	0.038***	
IVY League	0.276	0.354	

Table 7 (continued)

TOBIN'S Q		
Variable	Coefficient	p-value
Leverage	0.269	0.604
FirmSize	-0.112	0.076**
StockReturn	-0.048	0.583
<i>IndustryCode</i>		
Agriculture, Forestry and Fishing	-0.582	0.709
Mining	-0.592	0.478
Construction	0.005	0.996
Manufacturing	0.721	0.310
Transportation, Communications, Electric, Gas and Sanitary service	0.115	0.879
Retail Trade	2.667	0.002***
Finance, Insurance and Real Estate	-0.008	0.992
Services	1.121	0.127
Probability	0.000	
Adj./Pseudo R2	0.231	
Observations	189	

Note: OLS regression is run with Tobin's Q as dependent variable. GAI is the main independent variable, the other mentioned variables are control variables. *p<0.10, **p<0.05, ***p<0.01 significance levels are at 10%, 5%, and 1%, respectively. Panel A includes the regressions without including control variables in the model and Panel B represents the results after adding the control variables into the model.

CEO age results significant with negative effect and CEO tenure significant with positive impact. These findings suggest that firms who employ older CEOs encounter decreasing firm performance, although, the longer CEOs hold the executive function the better performance firm achieves. Firm size and Previous CEO are both negative at significant level, which points out that CEOs who have previously held CEO position at another firm do not have a positive impact on Tobin's Q of the current firm, where they work. From the industry perspective, the only industry with positive and significant effect is Retail Trade, others result insignificant for firm performance.

Based on the results of the OLS regression, I conclude that the general managerial skills CEOs have obtained throughout their educational and career history do not influence the firm performance according to Tobin's Q of the firm. Therefore, I reject the null hypothesis that generalist CEOs achieve better firm performance at significant level. The normality of the residuals in Shapiro-Wilk test results with W of 0.817 for the residuals, which is quite high and could indicate normality, however, the sample has a p-value of 0.000 which is lower than the threshold of 0.05, therefore, I reject the null hypothesis of this test that the sample has a normal distribution.

6. Discussion and Conclusion

Does orientation of the CEO skills matter? Do CEOs with a certain type of skills attract higher remuneration? Is it followed by better firm performance? These are the main questions that have been asked, attempted to answer, and put the main focus on in this study. This master thesis has examined the relation between skills of appointed CEOs and their compensation and firm performance. CEO skills have been divided into general and firm-specific managerial skills based on educational and career background of the CEOs. By researching and analyzing this topic, I expected to find a positive relation between the general orientation of CEO skills and both dependent variables, based on the indications of prior literature which has been done regarding CEO compensation and optimal contracting theory. Although, positive relation has been found between CEO skills and both CEO compensation and firm performance, only the relation with CEO compensation resulted significant, which contributes to the existing research that I find mainly consistent with the findings on CEO compensation, as well as, offers another wide range of questions to be answered in the further research.

Previous studies have found a positive relation between CEO skills and executive compensation leading to a conclusion that certain characteristics of human capital of CEOs influence setting the level of CEO compensation. Following these studies by Falato et al. (2015) which shows that talented CEOs are rewarded based on the human capital they have shaped over the years of experience and by Custódio et al. (2013) which provides evidence that CEOs whose managerial skills are generally oriented receive higher total compensation compared to CEOs who specialize in one area, when they are categorized based on previously obtained career experience, this study contributes to this stream of literature by researching CEO human capital from a different viewpoint and examining CEO skills from both educational and career perspective at once. The results in this thesis are consistent with prior work that has been done, showing that CEO skills do matter in regards to CEO compensation. Harris and Helfat (1997) find that CEOs who have had an experience in different industries are valued the most which I can confirm based on the results of this study which indicate that the average industry experience of CEOs who get higher compensation is in more than two different industries. CEOs who have had the opportunity to gain more general managerial experience, either education or career-wise receive higher compensation, although, not all the components of CEO compensation are equally dependent on general managerial CEO skills. There is a significant relation between CEO compensation and CEO skills which is mainly due to equity-based compensation being dependent on CEO human capital since cash-based compensation results

highly insignificant. This is consistent with the description of different components of the compensation by Balsam (2002) stating that cash-based compensation is mainly independent from CEO skills or firm performance, although, can differ between firms of different sizes and also depend on whether CEO has held CEO function before, whereas, equity-based compensation mirrors the differences between individual CEOs. However, cash-compensation. With these findings I fill in the gap in the previous research and my study indicates that both educational and career path which each CEO has decided to follow contributes to the final compensation, primarily equity-based part of it. From the decision what degree to pursue and whether to obtain more graduate degrees to the differentiating and gaining experience in diverse career areas, all these choices have an implication on current total compensation of CEOs.

The basis of my second hypothesis was optimal contracting theory which suggests that the most talented CEOs should receive the highest compensation (Frydman and Jenter, 2010) due to bringing added value to the firms and, therefore, winning over their competition in the market and maximizing shareholders' value. But is it the case? In the first section I confirmed, that CEOs with general education and career experience earn higher compensation than CEOs who specialize in one area. According to these findings and literature on optimal contracting I expected for generally-oriented CEOs to achieve better firm performance, which brought surprising results. Regarding the tests on firm performance, I was unable to confirm the second hypothesis that CEOs with more general managerial skills lead firm to a better performance. The fact that the relation between general CEO skills and firm performance is insignificant indicates that the 30-year long trend of increasing CEO compensation does not originate in optimal contracting. Therefore, this thesis falls into the stream of literature doubting effective setting of compensation packages. Murphy and Zábajník (2004) in their summary of previous studies which have been done regarding this topic conclude, that due to the changes in economy, CEOs with general managerial skills, find themselves to be more valuable to the firms and Falato et al. (2015) find positive relation between CEO human capital and firm performance, however, this study does not provide significant evidence supporting this argument. Despite the extensive work on the abilities of generalist CEOs, in which Buyl et al. (2011) believe that generalist CEOs enhance the functionality of Top Management Team due to their diverse background, in addition, Custódio et al. (2014) find a positive relation between general managerial skills of CEOs and their engagement in innovation, and Xuan (2009) views generalists as CEOs who are more efficient with segment investments, with this study I am not capable to add evidence to this part of research. The reason behind it might be my choice of

dependent variable measuring firm performance, Tobin's Q. Another possible factor for insignificant results might be the role of CEO education in CEO skills. According to Bhagat et al. (2010) CEOs with general degree do improve short-term firm performance after they are hired, however, the performance does not continue to improve in the long run, therefore, the importance of the orientation of the managerial skills based on education might become less significant with increasing tenure. In this regard the previous studies have also focused on more pessimistic possibilities of explaining increasing CEO compensation. Study by Bebchuk and Fried (2003) indicates that the bigger power CEOs have the more opportunities they have to satisfy their own interests through extracting rents, moreover, Lin et al. (2013) believe that CEO compensation is rather relationship than performance-based, meaning that the longer the tenure of the CEO the more power CEOs get in negotiating about their compensation without achieving desired firm performance. However, in this model I found significant relation between firm performance and both CEO age and CEO tenure, which was negative and positive, respectively, which contradicts the argument of Lin et al. (2013) and indicates that longer tenure has a positive impact on firm performance. Some might assume that the two variables, age and tenure, represent the same, although that is not the case. There are occasions when CEOs who are younger have held the CEO position for a longer period of time than older CEOs. In this case the results indicate that the higher the age of CEOs the lower Tobin's Q and CEOs with longer tenure influence Tobin's Q positively. Therefore, for the firm's performance is the best to have CEOs at younger age to gain the experience throughout their tenure which will enhance the performance. The findings regarding CEO skills and firm performance in this thesis land in the middle of the two approaches. Optimal contracting approach, thus, positive relation between CEO skills and firm performance does not result significant, however, I find that increasing tenure improves firm performance, which contradicts "fat cat" theory approach, that CEOs are able to easily extract rents with increasing tenure without corresponding performance.

Limitations and further research

This study has several limitations which can be worked on and improved by further research of this topic. First, for my sample, I only use CEOs who has held their executive function in firms which belong to the S&P 500 firms. The firms included are all quoted firms, therefore, including private companies in the sample could lead to different results. Second, when examining career background of the CEOs, I concentrate the research on quoted companies as well, due to unavailability of necessary information about private companies, more specifically their SIC codes, in financial databases. It is possible to get the information on

private companies through different resources but it would be very time-consuming and the time frame for this thesis did not allow me to do so. Although, the additional information could influence the results as well, if CEOs have had experience in different private firms within different industries that would lead to a different classification of the individual CEOs, from specialist CEOs with firm-specific experience in quoted firms could become generalist CEOs based on their broader experience in private firms, thus, different results. Third, CEOs are very important in achieving desired goals for the company, but they are not the only ones who bring the added value, there is the entire management team which has an impact on the final firm performance. Opportunity for further research also gives the fact that I was unable to confirm my second hypothesis. I used Tobin's Q to measure my dependent construct firm performance, which is known to reflect handling of assets, it is possible that other studies which would concentrate on different measures might put the study into a different perspective and measure the effect of CEO skills on firm performance in the area where CEO skills do have an impact. Moreover, due to the limited sample size used in this thesis, it is possible that insignificant results for firm performance are the result of lower statistical power rather than absence of relation between CEO skills and firm performance.

Conclusion

I examine the relation between CEO skills and CEO compensation as well as firm performance. I find, that CEO annual compensation is significantly dependent on CEO skills, however my results indicate that general orientation of CEO skills does not play a significant role in firm performance. Which brings up the question "If the orientation of CEO skills does not have an impact on firm performance, why does board of directors take it into consideration when setting a compensation for their CEOs?". The fact is, that it is the board of directors does not have a lot of information available when hiring a CEO besides his educational and career experience. There are many more characteristics which predict a talented CEO but are not as easy to gain access to as mentioned educational and career experience. Therefore, the compensation is set based on the information which is available to the firm rather than additional skills which CEOs will need in order to run the firm efficiently. This thesis suggests that even though CEO skills do matter in setting compensation packages, they do not significantly improve firm performance, which firms should pay attention to when setting the compensation packages for their next CEOs.

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Appendix

Table 9 Current papers on CEO skills and compensation

<i>Paper</i>	<i>Sample and data source</i>	<i>Firm-Years</i>	<i>Main Empirical Hypothesis</i>	<i>Method/Dependent Variable/Results</i>
Custódio, Ferreira, and Matos (2013)	(S&P) 1,500 firms over 1993–2007	25,562 CEO firm-years in the 1993–2007	H1: CEOs with higher general managerial ability receive higher pay	OLS regression (Log CEO total pay) Firm size (+) Growth opportunities (+) GAI (+)
Falato, Li, and Milbourn (2015)	(S&P) 1500 firms over 1993-2005	2,195 CEO succession events for a total of 20,904 firm-year observations	H1: CEOs with better credentials receive higher total compensation. The relation between CEO pay and credentials is convex in that the credentials premium is increasing in credentials. In addition, there is a complementarity between pay for credentials and firm size, in that the credentials premium is increasing in firm size.	Baseline regression (Log total annual compensation) CEO credentials (+)
Harris and Helfat (1997)	Forbes annual surveys of executive compensation over 1978-1987	305 CEO successors in the firms listed in all 10 years of the survey	H1: External CEO successors receive greater initial non-contingent compensation than do internal successors. H2: External CEO successors who have only generic skills receive greater initial non-contingent compensation than external successors who have industry-specific experience.	OLS regression (Log of salary and bonus) External successor (+) Firm sales (+) Past ROA (+) External successor without industry experience (+)

Note: This table presents review of current articles which focus on CEO human capital as determinant of CEO compensation and are referred to in this thesis. The table does not necessarily present all testable hypotheses, variables and results examined in the papers, however, it concentrates on the information which intertwines with the objective of the thesis.

Table 10 Current papers on CEO skills and firm performance

<i>Paper</i>	<i>Sample and data source</i>	<i>Firm-Years</i>	<i>Main Empirical Hypothesis</i>	<i>Method/Dependent Variable/Results</i>
Buyl, Boone, Hendriks, and Matthyssens (2011)	14 Belgian and 19 Dutch firms	N/A	H1: The positive relationship between TMT functional diversity and firm performance is moderated by the functional background of the CEO. Specifically, the relationship between TMT functional diversity and firm performance is strengthened when the CEO is a functional generalist.	Moderated regression (TMT) Generalist CEO (-)
Custódio, Ferreira, and Matos (2014)	(S&P) 1,500 firms over 1993–2003	2,377 CEOs from 10,523 firm-year observations between 1993 and 2003	H1: CEOs with more general skills foster innovation	1. OLS regression (natural logarithm of one plus the number of patents) GAI (+) 2. OLS regression (Exploratory Ratio 80 (60) and the Exploitative Ratio 80 (60)) GAI (+)
Xuan (2009)	(S&P) 1,500 firms over 1993 and 2002	265 new CEOs at 230 diversified firms after turnovers between 1993 and 2002, 715 segments in total	1. Bridge-building hypothesis (a specialist CEO with less power should engage in more bridge-building effort) 2. Diversification hypothesis	OLS regression (segment investment ratio, industry-adjusted segment investment ratio) Specialist*Out-group*After (+) Segment Cash-flow (+)

Note: This table presents review of current articles which focus on CEO skills as a determinant of firm performance and are referred to in this thesis. The table does not necessarily present all testable hypotheses, variables and results examined in the papers, however, it concentrates on the information which intertwines with the objective of the thesis.