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The two-headed CEO structure: beauty or a beast?

An empirical research on the behaviour of co-CEOs on a firm's risk

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Abstract

A research that examines a rare shared leadership phenomenon called the co-Chief Executive Officer (co-CEO) structure. The structure is unique because two CEOs are responsible for the task that is normally done by one person. Yet, in this construction, the authority discrepancy (power gap) between the two CEOs is questionable. The discrepancy emerges from this type of construction and could possibly affect the firm's risk appetite. In the conducted research, every company of the S&P500 that persisted a co-CEO structure is taken into account for this investigation. In addition to the power gap, risk appetite relation, the amount of managerial entrenchment is also considered to control for governance installed to deal with possible agency issues in the co-CEO structure. The analysis demonstrates that there is no direct evidence for a relationship between a power gap of the CEO dyad and the firm's willingness to take on risk. Furthermore, it can be concluded that managerial entrenchment does not influence this relationship.

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Keywords:

CEO, Co-CEO, risk, risk appetite, leverage, shared leadership, power gap, power differences, inequality, gender

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1. Introduction

Leadership is an extraordinary trait, only given by one person in any society. This person has an exceptional look on wisdom and truth. Plato, 400 B.C.

Shortly after Plato stated this quote supporting sole leadership structures, his pupil Aristotle stated something very different in his work called *Nicomachean Ethics*. Here, Aristotle claims that wisdom never is the sole province of one person, making anything beside sole leadership counterintuitive and irrational. However, the wisdom of Aristotle fell on deaf ears and humankind kept believing that sole leadership is the only possible way of leading for centuries.

In 1916, Fayol, a scientist with an interest in management and leadership theories, wrote in his book *14 Management Principles* about the unity of command, stressing the fact that only one individual at a time should lead an organisation (Fayol, 1916). While Fayol came up with his theories almost a century ago, many of his principles are still represented and used in contemporary management theories (Pryor, 2010). However, when examining the last 30 years, it is evident that the sole leadership paradigm is starting to crumble. This provides room for shared leadership theories, responding to Aristotle's vision on this topic.

In the current research, a specific kind of shared leadership is explored. The inspiration for shared leadership started with a paper of Ryan Krause (2013), which was named "Who's in charge here? Co-CEOs, power gaps, and firm performance". In this paper, they paid special attention to a shared leadership, called 'co-Chief Executive Officers (co-CEOs) Furthermore, they elaborated on a rare kind of shared leadership that only seem to occur in very specific circumstances. These specific circumstances are elaborated throughout the theoretical part of the current research.

In practice, there are numerous examples where shared leadership was beneficial for organisations. Nonetheless, there are also records of companies where these structures backfired and did not turn out the way they should. Examples of organisations that flourished

and deteriorate under such a structure are provided in the theoretical background part of the current thesis.

In 2013, Krause wrote an article whether one CEO has more power than the other, and if that affected the performance of the organisation. The so-called difference in power is also referred to as a 'power gap' and is used as a central theme in this thesis. The potential power difference between co-CEOs provided the inspiration to write this thesis. Another reason is that while a limited body on this subject exists, shared leadership is relatively underexplored.

In contrast, a large body of knowledge is available on gender diversity in boardrooms. How does this relation thrive in a co-CEO structure? Early research pointed out the disproportional presence of women in executive positions, but it is unclear whether this is also applicable in a shared leadership structure and is, therefore, taken into account in the current research.

Assuming when there is a co-CEO structure, how can the shareholders prevent or minimise the chance of creating a conflict of interest? In order to control for this agency problem, this research examines whether the CEO is entrenched in the company. For this reason, an index is created to test to which extent a CEO is entrenched in the organization.

Returning to the power gap. What will happen with a company's risk appetite when a power gap is created? One of the plausible outcomes can be that the willingness to take on more risk will be greater when such a power gap is present. Here, the question arises whether one CEO might be willing to take on more leverage. The research question combines all previous into the following research question:

Will the power gap between CEOs affect the risk-seeking behaviour of a company?

In research of Krause et al. (2012), it is proven that companies who adopt a co-CEO structure tend to be less risk seeking and have on average lower leverage than other similar companies. Therefore, the expectation is that when the balance between CEO's is distorted, this could lead to an increase in risk-seeking behaviour, translating into a higher debt to equity or debt to assets ratio.

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To answer the research question, the following sub-questions are formulated:

1. Does a higher difference in power between co-CEOs lead to a higher risk appetite?
2. Do gender differences between co-CEOs lead to lower risk appetite?
3. Does entrenchment limit the impact of the power gap on risk appetite?

Evidently, having two co-CEOs has its opportunities and threats, as having two highly educated, experienced people in one chair can lead to complementariness while leading a company. With complementariness, the synergy of the skills and competencies of these two managers is intended. On the other hand, there is a well-known saying stating that ‘there can only be one captain on a ship’, meaning that two CEOs might lead too much to an internal power struggle and could create personal conflicts. Moreover, this could have devastating consequences for the health and prosperity of an organisation.

In order to test his hypotheses, Krause used a methodology for constructing the power gap, and his methodology was used as an example and a common thread for this thesis. In the article of Krause, the power gap was constructed by creating an index per CEO, combining the CEO’s salary, tenure, board presence, and stock ownership into one score and compare this score with the score of the other CEO. As for measuring entrenchment, the methodology of Bebchuk, Cohen, and Ferrell (2009) in their article “What Matters in Corporate Governance?” was used. The data was primarily collected from several databases for a research in period ranging from 1995 to 2015. This long period was necessary to collect enough CEO dyads to form a representative sample.

This research is relevant due to the fact that shared CEO structures are not an overly explored research area. This creates a challenge in locating suitable literature. Regardless of this lack of information, a complete and compact insight into the available literature concerning this topic is provided.

This thesis has the following structure. After a short introduction of the topic and the research, a compact literature review on co-CEO structure, power gaps, entrenchment indices, and gender differences is provided. This review elaborates on the previous literature. Chapter 3 presents the conceptual framework of the research and how the research questions were transformed to make them testable for empirical research. Chapter 4 demonstrates how data was collected and analysed in Stata to make the hypotheses testable and useful to

interpret. ⁹³ Chapter 6 offers the results of the research, discussing the empirical results and ⁸³ implications of the model. The final chapter (5) contains conclusions, limitations, and suggestions for future research.

2. Theoretical background

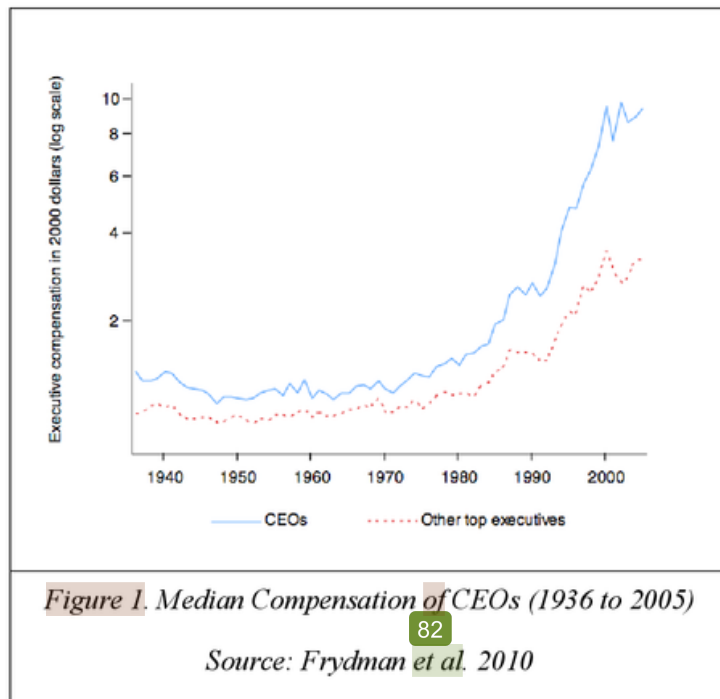
The theoretical background commences with a relevant introduction of what CEOs are, how they are compensated, and how they can influence a company. In the first part of the background, the basics of a CEO structure is emphasized in a shared leadership structure. This is followed with explaining the specific type of shared leadership, the co-CEO structure. Throughout this paragraph, several up- and downsides arise, which are illustrated in the last part. Gender also plays a significant role in higher management and is elaborated in the second part. From a diversity point of view, a closer look is taken into difference in power between CEOs in a shared leadership structure and the possible effect on risk. The theoretical background finishes with how company's try to confine a CEOs risk by entrenching this person.

2.1 Shared Power

2.1.1 What is a CEO?

A CEO has one of the highest ranked positions in an organisation. This position entails making significant corporate decisions, managing the core operations and resources of a company. In addition to this, a CEO is an important player in the communication with the board of directors. Within the Anglo-Saxon model of governance, a CEO also has a position in the board or even has the chair position (Elsayed, 2007).

Furthermore, CEOs and their compensation are inextricably linked to each other. As it is common knowledge, CEOs of publicly traded firms usually have extremely high salaries. The increase in CEO salaries has even grown at a fast rate compared to other executives, while firm size and performance stay behind, growing on a higher pace compared to production workers (Frydman, 2010). This is illustrated in Figure 1.



The role of a CEO largely depends on the size of the company and its overall structure. To illustrate, in relatively small companies, a CEO is more involved in day-to-day operations and fulfils a more ‘hands-on’ role. The CEO in a larger organisation has a different role and is more relevant for this research. For example, the CEO has the role of setting a long-term strategy and directing overall growth. Most of his or her tasks are delegated to other directors or departments (Thong & Yap, 1995).

For the current research, it is essential to further explore the field sharing leadership. For instance, is a position like the one a CEO holds dividable, making it possible to let multiple persons lead an organisation?

2.1.2 Shared leadership

Shared leadership is a topic which has largely been ignored in science and warrants additional theoretical and empirical attention (O’Toole, Galbraith, & Lawler, 2002). Yet, some theoretical and empirical exploration of the antecedents and outcomes of shared

leadership has been conducted during the past decade (Burke, Fiore, & Salas, 2003; Carson, Tesluk, & Marrone, 2007; Hooker & Csikszentmihalyi, 2003; Wood & Fields, 2007).

Within the realm of shared leadership, it is suggested that a lack or absence of shared command between leaders will decrease information sharing and creativity in top-level decision making (Pearce & Conger, 2003). As defined by Ensley, Hmieleski, and Pearce (2006), 'Team process where leadership is carried out by the team as a whole, rather than solely by a single designated individual'.

So far, most research that has been conducted about shared leadership focused on the team-level process that emerges in nature, not able to be created through hierarchical structures (Seers, Keller, & Wilkerson, 2002: 80). In addition, Pearce and Conger (2003) have defined shared leadership as leadership within a certain group in which the group members interact with each other to create dynamic influence to pursue collective goals.

As previously mentioned, research on shared leadership is relatively new (Pearce & Conger, 2003) and therefore lacks an abundance of definitions. Shared leadership occurs when all team members are fully engaged in the team's leadership and do not hesitate to encourage and guide their fellow team members to maximise the team as one. Hence, shared leadership entails a simultaneously mutual influence process within a team that is characterised by 'serial emergence' of official and unofficial leaders (Conger, 2002).

When examining the co-CEO structure, it can be considered as an extraordinary branch of shared leadership, the two-person case (Pearce & Conger, 2003, p. 14), which is discussed in subsequent sections.

2.1.3 Co-CEOs

What are co-CEOs?

In this thesis, the co-CEO structure is the focus point and tested. In literature, co-CEO structures are placed within the realm of shared leadership. As for the definition of co-CEOs, Alvarez and Svejnova (2005) used the following in their article "Sharing executive power: Roles and relationships at the top": 'two executives who, over time, perform the top job together in a coordinated fashion and are held jointly accountable for the company or unit's

result' (p. 115).

Largely and most commonly unknown to the public, several well-established firms adopted a co-CEO structure. In these structures, it is not unusual that the co-CEOs are former CEOs from two merged firms. Another possibility is that it is a family company and the co-CEOs are family members (Arena, Ferris, & Unlu, 2011), or when both CEOs founded the firm, they lead simultaneously (O'Toole, Galbraith, & Lawler, 2002). Figure 2 presents the results of the research performed by Arena et al. on what prompts a firm to adopt a co-CEO leadership structure. In their sample, almost 50% of the firms adopted such strategies because of a merger/acquisition or because it concerned a family firm.

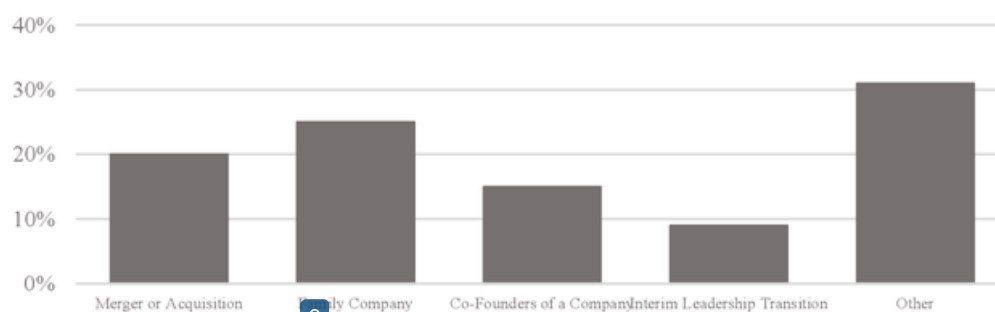


Figure 2. What causes a firm to adopt a co-CEO leadership structure? The data was retrieved from a sample by Area et al. The sample includes a survey of 111 with a total of 358 firm-year observations.

Arena et al. (2011)

In the last 25 years, only 21 companies in the Fortune 500 have used the co-CEO structure. Yet, there are companies with smaller revenue that have adopted the dual-CEO approach. Looking at the S&P 1500, approximately 100 listed companies adopted such a strategy in the past two decades. This number of observations stresses the importance and relevance of this research.

To illustrate, at SAP, the co-CEO structure turned out to be a success. Over 3.5 years, the co-CEOs spent more than \$14 billion on acquisitions to add mobile and cloud-computing technologies and accelerated a push in SAP's homegrown database product, boosting the stock about 70 percent and providing it with a brief run as Germany's most valuable company (Bloomberg).

As for Citigroup, the co-CEO marriage between the CEO of Travellers group (Sandy Weill) and Citigroup CEO (John Reed) was not as successful. After the announcement of the merger in 1998, it did not take long for the fundamental disagreements and big egos to get in the way of the business. Furthermore, in 2000, after losing billions of dollars, John Reed decided to abandon the ship. Professor Lawrence Hrebiniak has stated the following concerning the shared leadership relationship: 'Since they were both "strong people with strong views" when it came to determining the company's direction. In that case, the duality didn't really do them very good' (*New York Times*, 2000).

These examples indicate that there are advantages and disadvantages of a co-CEO structure, and it often depends on company and CEO characteristics whether such a structure succeeds.

Co-CEO implications: up- and downsides of a co-CEO structure

A co-CEO structure is not a universal solution to any corporate initiative. Each company has unique characteristics, where a shared leadership structured might (not) fit in. This makes it important to understand the potential benefits and pitfalls of a CEO structure.

Upsides of a co-CEO structure

The co-CEO structure is first introduced in the late 60s (1969). In this year, Robert Townsend wrote his bestseller called *Up the Organization*. In his book, he stipulated the advantages of joint leadership and how it is possible for an organisation to divide the CEO's task into two. As such, he compared the CEO dyad with yin and yang: 'Neither of us is very good, but our weaknesses (and strengths) may be compensating'.

He also said that the key to success for leaders was to split up task, check in advance for strategic matters, and stay informed about daily disasters (Pearce & Conger, 2003).

According to Pearce and Conger (2003), co-leadership is justifiable because one senior manager usually does not possess all the skills and competencies required. Therefore, more than one leader might be necessary to effectively run an organisation. Moreover, O'Toole, Galbraith, and Lawler (2002) state in their article that despite continuing assentation that co-leadership does not work, two CEOs are better than one when firms become too complex to be run by an individual.

Furthermore, when an organisation has a co-CEO structure, it has the ability to divide the organisation into two areas and assign a CEO to that area. Based on the CEO's skills and competencies, the CEO can focus on reduced number of areas and enhance its effectiveness.

Downsides of a co-CEO structure:

The co-CEO structure can also have its limitations. For instance, strong leaders have the tendency to attract people who believe in them. When having two co-CEOs, it is possible that staff member line up behind one of the two CEOs, creating a disparity in the organisation, which could eventually harm the organisation (O'Toole, Galbraith, & Lawler, 2002).

The presence of two co-CEOs might also create disjointed decision making and can result in coordination problems and interpersonal conflicts between the managers and the company (Hackman, 2002). In addition, dominant personalities of CEOs can result in friction and competition for power between individuals. According to Alvarez and Svejnova (2005), this can lead to an instable and non-sustainable organisation over time. As this competition for power could eventually lead to a difference in power, a so-called power gap is created. The definition and constitution of this variable is further on elaborated.

2.2 Diversity

Several authors have argued the fact that large firms might reap the fruits from the complementarity of a CEO dyad (O'Toole, Galbraith, & Lawler (2002); Pearce & Conger (2003). For example, multinational companies might desire to split their operations into a domestic and international division and offer the CEOs different responsibilities.

Nevertheless, when looking at the diversity of tasks in management, it is of utter importance to examine the diversity in terms of CEO characteristics. In recent literature, several researchers have stated that this type of diversity will lead to an increased amount of knowledge and more creativity and, therefore, becomes a competitive advantage (Watson, Kumar, & Michaelsen, 1993).

When examining this relation of diversity and firm performance, the literature used workforce diversity as opposite to diversity in boards. In 1989, Murray conducted a study on

diversity at organisational levels. Here, he used 84 companies to investigate heterogeneous and homogeneous groups and their effect on firm performance. He measured these by age, level of degree, tenure, and work history. The results indicate that performance and diversity depend on the industry in which an organisation operates. For instance, the homogeneous groups seemed to be more effective in highly competitive markets, while heterogeneous groups were more effective regarding organisational change, suggesting these groups are more proficient in rapidly changing markets.

2.2.1 Gender diversity

In Croson and Gneezy's article (2009), gender related differences in risk aversion is studied. They provided the evidence that women have a lower propensity for risk taking compared to men. Furthermore, literature by Sundén and Surette (1998) and Bernasek and Shwiff (2001) document that women are significantly more risk-averse in their allocation of wealth to pensions. There is also more corporate proof for women's risk-taking behaviour. For example, Adams and Ferreira (2009) provide evidence that CEO turnover is significantly higher when the board of directors is more gender diverse.

Yet, there is little evidence of how women perform as managers in publicly traded firms because women are rarely on the top position of such firms. In the article of Faccio et al. (2016), it is proven that gender can affect corporate risk-taking choices. More specifically, firms that are led by female CEOs tend to make less risky financing and investment decisions than firms led by male CEOs. In their results, they stated that women will not undertake every net present value project and their results cannot be explained with agency, informational asymmetries, or overconfidence considerations.

In the article of Faccio et al. (2016), some potential alternative interpretations were offered to explain the gender difference. When looking at the agency context, there is scientific proof of the fact that women are less likely to commit crimes in comparison to men (Hill & Harris, 1981; Shover, Norland, James, & Thornton, 1979; Steffensmeier & Allan, 1996; Gërkhani, 2007). This could also explain the assertion that women are less likely to take on more leverage and therefore risk.

The second factor mentioned in the article is asymmetric information. In earlier research, it has been established that the quality of earnings reported by firms with female analysts, auditors, or directors are significantly of higher quality compared to similar companies where men occupy these positions (Srinidhi, Gul, & Tsui, 2011; Thiruvadi & Huang, 2011). Concluding, the potential for information asymmetry and undervaluation is higher with male CEOs and, therefore, men tend to take more risk.

In other research, it has been stated that managerial overconfidence leads to investment overestimation and, consequently, to overinvestment (in case of sufficient internal funds) (Malmendier & Tate, 2005, 2008; Malmendier, Tate, & Yan, 2011). In the article of Faccio et al., they have implied that men are more likely to understate the riskiness of an investment opportunity and, thus, are more likely to take on higher risk. However, according to Malmendier, overconfidence leads to misallocation of funds; hence, managers misinterpret information, resulting in poor choices. Yet, no scientific evidence was found of overconfidence as an explanation for the lesser risk-taking of female CEOs.

Based on the article of Faccio et al., the assumption is made that gender diversity in a co-CEO dyad would have a negative effect on leverage.

2.3 Consequence of diversity: introducing the 'power gap'

1 According to Finkelstein (1992), 'CEOs have high structural power over other members of dominant coalitions because of their formal organizational position. This authority allows CEOs to manage uncertainty by controlling (to a degree) the behaviour of their subordinates' (Finkelstein, 1992: 508 – 509).

In this statement, Finkelstein highlighted the fact that CEOs have primarily been investigated in relation to the board of directors or the rest of the top management team (TMT). Stating that when someone becomes a CEO, he or she has the most structural power due to a preeminent formal organisational position (Finkelstein, 1992: 509).

Furthermore, the vertical hierarchy of a CEO becomes neglected when a co-CEO structure exists because of the equivalent amount of structural power. With the absence of formal hierarchal power within the CEO dyad, other sources (might) explain why one certain CEO

has more power compared to the other. For a co-CEO-structure to work in relation to the shared leadership tradition, power and authority must be decentralised among the two co-CEOs (Pearce & Conger, 2003). As Mayo, Meindl, and Pastor (2003: 203) wrote, 'The degree of shared leadership in a team can be thought of as the degree of team decentralization'. Thus, in a co-CEO team, this means that shared command is the most effective when power gaps are minimal.

Furthermore, it has been proven that there are growing destructive effects of CEO dominance when an environment becomes more turbulent. Moreover, when power is mainly concentrated in the CEO role, it leads to decrease in cohesion and creativity in the Top Management Teams (TMTs). (Denis, Lamothe, & Langley, 2001; Peterson et al., 2003; Pitcher & Smith, 2001). The existence of a power gap therefore makes the possibility of shared command impossible, negatively impacting the firms performance (Ensley et al., 2006; Hmieleski et al., 2012).

2.4 Firm risk

As discussed in the previous part of the theoretical background, the downsides of a co-CEO structure (diversity) could eventually lead to a difference in power. In the paper by Krause et al. (2013), the influence of this power gap on the firm performance was explored; yet, the study neglects the risk exposure this construction might create.

2.4.1 CEOs and risk appetite

In the article by Coles et al. (2010), it is found that higher sensitivity of CEO wealth to stock volatility leads to riskier policy choices. Including relatively more investment in Research and Development (R&D) less investment in property, plant and equipment, more focus on fewer lines of business, and eventually a higher leverage.

Additionally, in the article by Belghitar et al. (2012), it is stated that the CEO risk appetite has an important effect on firm volatility. The biographical measures (e.g. age) for CEO risk appetite are significant explanatory variables of all measures of firm volatility employed in his study. In the study, the effect of CEO age on risk appetite is the only positive variable,

while the variables CEO education, tenure, and CEO time on other boards have a negative effect on the total and idiosyncratic risk of the company. This paper therefore highlights the importance of CEO risk appetite in the determination of firm volatility and suggest that age, education, and job experience should be considered when determining CEO compensation packages.

Furthermore, there is also recent literature on co-CEOs and firm's leverage. For instance, Arena et al. (2011) state that firms with lower leverage, less independent boards, more restricted corporate scope, lower institutional ownership, and higher level of merger activity are more likely to adopt a co-CEO structure. As such, especially merger activity contributes largely to the existence of co-CEO ships.

From the literature mentioned, it is assumed that a higher power gap between co-CEOs leads to an increase in risk appetite. However, the question is, how can shareholders prevent the CEO's hunger for risk in such a way that it does not harm the company or the shareholders' vision?

2.4.2. Measures to prevent risk appetite: Entrenchment

In 1976, Jensen and Meckling stated that investors with large ownership have the incentive to maximise value of a company. These same investors are able to collect information and oversee managers, overcoming one of the most familiar agent problems in the modern organisation; conflict of interest between agent and principal.

When looking more specifically at entrenchment, managerial entrenchment is one of the costliest of the agency problems (Jensen & Ruback, 1983). When managers have the ability to expropriate themselves from being in control and yet have the responsibility over a limited amount of cost, they are able to implement very costly entrenchment strategies to maintain their position, even when they are technically not suited for the position (Shleifer & Vishny, 1989).

While examining entrenchment practices, it is evident that there are multiple practices that managers employ (Walsh & Seward, 1990). The most common are the poison pills, supermajority amendments, anti-takeover devices, or the so-called golden parachutes (Dahya

et al., 1998; De Miguel et al., 2004; Denis et al., 1997; Morck et al. 1988; Stulz, 1988). When a company is somewhat forced to keep the managers within the company, using these measures could result in an expropriation of investor wealth or inadequate use of resources (Shleifer & Vishny, 1997).

Nonetheless, there are also circumstances where management entrenchment could lead to a positive result, or does not harm the company's result. For instance, in capital markets where the focus is on short-term returns, entrenchment leads to a tool where it functions as a long-term contract. This contract enables the manager to be more protected and he or she can carry out investments whose returns are considered to be more long term.

Rajan and Wolf (2006) have also examined positive managerial productivity in the light of entrenchment. They stated that implementation of managerial entrenchment strategies lead to a positive effect on the productivity and improve firm's performance.

In another article concerning entrenchment, it has been argued that boards of directors might be less effective in monitoring powerful and eminent CEOs. This power struggle could be more pronounced when two CEOs share the responsibilities in a company. In other words, a co-CEO structure might lead to an increase in power for the dyad, leading to a decrease in the ability for a board to oversee the company.

Moreover, it can occur that the co-CEOs function as mutual monitors. Co-CEOs monitor each other, making the monitoring of the board of directors superfluous; this is also true for the advising part of the board of directors. These same board of directors also have the possibility to advise a CEO if necessary (Adams et al., 2011). Within a co-CEO structure, the CEOs complement each other in expertise and job responsibility (Arena et al., 2011). This again could lead to an superfluous board of directors.

Extrapolating on the literature, there could be an entrenchment link in the relation 'difference in power' and 'risk appetite'; therefore, it is relevant to include entrenchment interesting in the current research.

3. Hypothesis Development

In this part of the research, the hypotheses are created with the theoretical knowledge of chapter 2. In the second part, the conceptual framework is presented.

3.1 Research purpose and questions

The theoretical background was used to obtain information about the subject matter and to form the background for the development of the hypotheses. To test the hypotheses in the empirical research, a short description of the methodology is provided for each hypothesis. The tests used hypotheses similar to those in recent papers about co-CEOs.

¹
H1 - A higher *difference in power gap between co-CEOs* leads to a higher risk-seeking behaviour.

⁵⁵
As mentioned in Krause et al. (2013) and Arena et al. (2011), a difference in the power between Co-CEOs is regarded as predictor of possibly unwanted behaviour. Arena et al. have stated that mutual checks and balances in the dyad that makes the Co-CEOs work might not be in place in a disturbed power balance, which would lead to one of them choosing to be more risk seeking, while the other not being able to counter this decision.

To test the first hypothesis, the methodology of Krause et al. was largely used. This is a panel data regression that predicts the linear relationship between the power gap and the amount of leverage the company prefers for the available firm years of a co-CEO dyad. The hypothesis ¹ states that a larger power gap between the Co-CEOs should indicate a higher leverage.

H2 - Gender differences between co-CEOs lead to lower risk-seeking behaviour and therefore to a lower leverage.

⁷¹
For the second hypothesis, the example by Sundén and Surette (1998) and Bernasek and Shwiff (2001) was taken. In ² these studies, it is stated that women are more risk-averse when allocation wealth to pension funds. Additionally, in the current research, the ⁷⁰ alternative explanations of Faccio et al. were also taken into consideration. Here, they stated that women are more likely to report honestly and are, furthermore, less willing to take risk.

To test the gender relationship between males and females, the same panel data in hypothesis 1 is used to test this hypothesis. In this hypothesis, the linear relationship was tested whether the CEO is a man-man, man-woman, or woman-woman dyad. Indicating that a man-woman relationship leads to lower risk appetite for the dyad and, therefore, less risk-seeking behaviour and leverage for the company.

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H3 - *Entrenchment has a negative impact on the effect of difference in power between CEOs (power gap) and risk appetite.*

Hence, a relationship exists between a power gap and risk appetite. So, in order to confine a company's risk exposure an entrenchment strategy can be applied. Rajan and Wolf (2006) have stated that entrenchment leads to positive managerial productivity. As such, it is assumed that entrenchment can be used by principals to increase their span of control in the company and decrease risk exposure.

For the relationship between power gaps and risk appetite, the entrenchment index was used as a measure and tested in relation to risk appetite. To construct the entrenchment index, existing literature was used. Methodology by Bebchuk, Cohen, and Ferrell (2009) was replicated to create a number which resembles the extent to which a specific CEO is entrenched within the company. Therefore, this variable was used as a moderator to test the effect of entrenchment on the relationship between a power gap and risk appetite.

In the succeeding part of the hypothesis development, a graphical representation of the relationship between the dependent, moderating, and independent variables are displayed on the next page.

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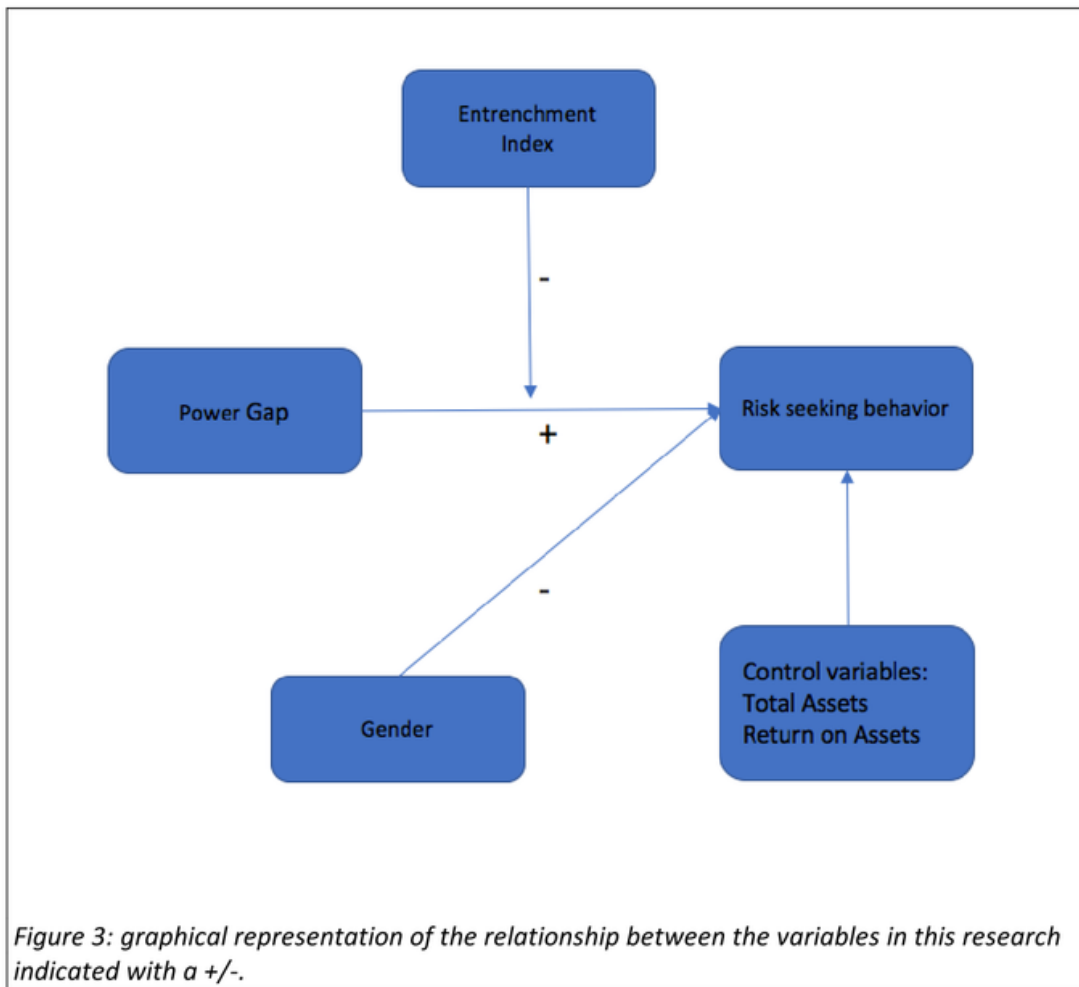


Figure 3: graphical representation of the relationship between the variables in this research indicated with a +/-.

4. Research design

In this chapter, the method of data collection is elaborated and explains which steps in Stata were taken to generate the research results. This chapter starts with how the data was obtained from databases, such as Wharton Research Data Services (WRDS), Compustat, governance database ISS (former RiskMetrics), and how the data was modelled to make it useful for this research. The final part explains how the variables were created to test the hypotheses and how they were tested.

4.1 Data preparation

This research began by searching through the entire database of WRDS for the mention of CEO dyads. Several financial databases are listed in WRDS, but Execucomp is considered to be the most suited for this research. Yet, WRDS and Execucomp only integrated S&P 500 companies in their database due to the specific of CEO information. This limits this research to the S&P 500, due to lack of available data for companies from other indices.

The chosen period for this dataset was 1995 to 2015. This was done intentionally due to rare character of the adoption of a co-CEO structure. In Execucomp, the following 18 variables were selected: *Company Name, Company ID Number, Industry Group, Executive ID number, First Name, Last Name, Gender, Date Became CEO, Date Left as CEO, Executive's Age, Bonus (\$), Salary (\$), Total Compensation (Salary + Bonus + Other Annual compensation), Annual Title, Fiscal Year, Annual CEO Flag, ID number for each executive/company combination, Company ID Number*). The variable extension was selected to prevent incompleteness of this research. The result was 225,346 hits of years and CEO information.

The selected dataset created a useful standpoint, having all the CEOs of every year of every firm in the S&P 500, to further narrow the research down and make it suitable for obtaining results. To extract the companies that had a co-CEO structure during the period 1995-2015, the dataset was filtered on *Annual Title*. The Excel filtering resulted in 544 hits. After filtering the data in Excel, Stata was used for the analysis.

To assure validity in this research, every co-CEO dyad that ruled for a period shorter than 2 years was omitted from the dataset. In order to do this, the variables "Date Left as CEO" and

“Date Became CEO” were selected and subtracted from each other in Excel. This created a variable that resembled the CEO’s number of days as an officer. Yet, approximately 150 values when leaving the company were missing. For these cases, the assumption is made that the CEOs are still in active as CEO and the date of 31/12/15 was used. Furthermore, approximately 30 values were missing the date of becoming CEO. These values were found manually in the yearly records of a company. In addition, the age was missing for approximately twenty CEOs. This was also manually added via the Bloomberg database.

In total, this led to a comprehensive dataset with 437 values and 75 unique companies during a 20-year period, and this was used as a starting point for the regression analysis in Stata. However, before being able to run a regression, several variables were constituted to test the following relationship.

4.2 Power gap constitution

In order to create the variable ‘power gap’ for this research, several sub-variables had to be merged into one and are listed below:

1. Difference in tenure: greater tenure indicates greater power;
2. Difference in salary: greater salary indicates greater power;
3. Board chair presence: the board chair component took a value of -1, 0, or 1, depending on which co-CEO(s) held the chair position; and
4. Non-numeration: a greater non-numeration indicates greater power.

For each CEO company dyad, the difference in scores was calculated for each of the above measures. Thus, for every dyad, the dataset ended with 4 index components. Three of the component represented the amount of standard deviations between the two co-CEOs for tenure and non-numeration. In the methodology by Krause et al. (2013), stock ownership was used instead of non-numeration to constitute the power gap. Due to the lack of stock ownership data available in Execucomp, non-numeration compensation was chosen instead. The board chair presence component was valued as -1, 0, or 1, depending on which co-CEO(s) held the chair position.

To create the power gap variable, all four components were added up and, subsequently, the absolute value of the sum was used. Hence, the power gap variable in this dataset reflects the

magnitude of the total power gap between the two co-CEOs. Yet, it is important to stress that this research does not focus on a specific co-CEO, since only the gap is taken in to account.

4.3 Risk appetite

In order to calculate leverage, the following formula was initially used:

$$\text{Leverage} = \frac{\text{Short Term Debt Total} + \text{Long Term Debt Total}}{\text{Total Assets}}$$

However, the variable debt missed too much data to be useful for this research and it was not possible to obtain this data manually. As a solution and in order to solve this lack of data without using debt as a variable, the following approximation was used:

$$\text{Leverage} = \frac{\text{Total Assets} - \text{Common Equity}}{\text{Total Assets}}$$

This eventually led to a useful approximation for leverage and a more complete dataset for a more reliable outcome.

4.4 Entrenchment index

The data for the entrenchment index was obtained from ISS (former RiskMetrics). Due to the timeframe of 20 years, the databases 'Governance' and 'Governance Legacy' were used. The 'Governance' database contained data from 2005 up until 2015. The 'Governance Legacy' database is consulted for the years 1995 up until 2015. This data had to be converted in order to stroke with the 'Governance' database.

To construct the entrenchment index, six provisions were taken into account and displayed below. Each company is given a score between 0 to 6, depending on how entrenched managers at the company were due to governance decisions within the company in a specific year.

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Breaking down these six provisions, the following four constitutional provisions that help to prevent the shareholders to gain too much power in the company:

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- Staggered boards;
- Limits to shareholder bylaw amendments;
- Supermajority requirements for mergers; and
- Supermajority requirements for charter amendments.

In addition to the four constitutional provisions, two 'takeover readiness' provisions (poison pills and golden parachutes) were also taken into account. These are provision that boards put in place to prevent a hostile takeover. By doing so, it created an indication per CEO and how entrenched they were in the organisation.

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5. Empirical results and analysis

In this chapter, the empirical results are discussed. First, the descriptive statistics are examined, followed by the results of each hypothesis.

5.1 Descriptive statistics

The frequency table is stated below. As can be observed in Table 1, a decrease in numbers is evident for the variables ‘Return on Assets’ and Entrenchment index. This variable discrepancy is caused by the lack of data from Compustat and ISS.

In Table 1, the descriptives of the variables in the model are presented. Due to lacking data in the databases, some of the items are missing. Because these variables were obtained from Compustat, no replacement were made by finding data by hand. It is not clear which of the published data were used by Compustat, and replacements by hand might bias the data.

Dependent variable	(1) Leverage	(2) Power Gap	(3) Gender	(4) ROA	(5) Market to Book	(6) Entrenchment Index
Observations	245	245	245	209	245	103
Mean	0.528	1.096	0.041	0.3840	7.611	2.146
Standard Deviation	0.244	1.754	0.198	0.144	2.208	1.240
Skewness	0.157	2.867	4.641	-1.784	0.502	-0.526
Kurtosis	1.975	14.206	22.543	19.270	3.228	2.339

Furthermore, the entrenchment index demonstrates a smaller sample, the ISS databases do not obtain all the data present in the Compustat database. In addition, an entrenchment index is not present for every company in the database.

Testing for parametric assumptions, the following issues were noted. First, the data have a strong positive Kurtosis, indicating that the values of the variables were concentrated. To correct for this, extreme outliers were removed. These were values beyond the first and 99th percentile. The data also revealed a possibly disturbing inequality of variance. This was corrected for by using an Areg model, instead of a regular panel data regression. The used model aided correcting for heteroskedacity and serial correlation in the data; moreover, no multicollinearity was found and the assumption of linearity was also met (see appendix I).

Table 2 – Correlation matrix

Dependent variable	(1) Leverage	(2) Power Gap	(3) ROA	(4) Market to Book	(5) Gender	(6) Entrenchment Index	(7) Interaction
Leverage	1.0000						
Power Gap	-0.272**	1.000					
ROA	-0.289**	0.109	1.000				
Market to Book	0.417***	-0.191*	-0.409	1.000			
Gender	-0.006	-0.116	0.078	-0.023	1.000		
Entrenchment Index	-0.180	0.256**	0.213*	-0.017	-0.013	1.000	
Interaction	-0.322***	0.937***	0.147	-0.171	0.106	0.453***	1.000

Correlation coefficients of pairwise correlation are presented. *, **, and *** denote significance at 10%, 5%, and 1% level, respectively

5.2 Regression models

In previous models, communal variables were used to predict the effect of differences in power between co-CEOs on firm results. In this model, these variables were used to predict the company's leverage. The relationship between leverage and its predictors was tested in five models, as stated in Table 3. Model 1 through 4 reveal an Areg regression without entrenchment as a moderator. In the 5th model, entrenchment and an interaction term (entrenchment * power gap) were added.

To test which type of model would be most suitable to predict the effect of power gap on leverage and take into account the unobserved influencing variables, a Hausman test was conducted between the random effects and fixed effects models. The test indicated that a fixed effects model was preferred (see Appendix II).

	(1)	(2)	(3)	(4)	(5)
Constant	0.517*** (63.99)	0.485*** (85.06)	0.547*** (96.03)	0.547*** (96.03)	0.501*** (5.23)
Power Gap	0.011 (1.47)	0.061** (2.56)	0.006** (2.33)	0.006** (2.33)	0.006 (0.23)
ROA		-0.068 (-0.70)	-0.0495 (-0.65)	-0.0495 (-0.65)	-0.248*** (-4.22)
Market to book			0.023*** (0.00)	0.023*** (0.00)	-0.079 (-0.57)
Gender*				-	-
Entrenchment Index					0.025 (0.54)
Interaction entrenchment *PG					-0.018 (-0.88)
Observations	245	209	193	193	78
Year Fixed effects	y	y	y	y	y
Month Fixed effects	n	n	n	n	n
F	2.16	6.90	24.93	24.93	6.87
	56 0.89	0.89	0.94	0.89	0.97

Results based on an Areg analysis, t-statistics are presented in parentheses. *, **, and *** denote significance at 10%, 5%, and 1% level, respectively

*gender omitted because of collinearity

As can be observed in model 4 and 5, gender is omitted due collinearity. The sample consisted of a limited group of gender diverse CEO dyads. When combined with the entrenchment index, all dyads that were gender diverse dropped from the sample.

5.3 Hypothesis testing

H1: A higher difference in power leads to a higher risk-seeking behaviour

The first hypothesis was designed to indicate how leverage will change, when the power gap between two CEOs increases in the period of 1995 until 2015. In models 2 to 4, the variable power gap reveals a statistically significant positive impact on leverage. When not controlling for entrenchment, this hypothesis can be confirmed. Nonetheless, it must be noted that the effect of power gap diminished strongly when controlling variables were added to the model (b=0.06, p<0.01 for model 2; b=0.006, p<0.01 for model 4).

H2 Gender differences between co-CEO's leads to lower risk appetite

The effect of gender could not be measured due to the lack of data for the complete sample. Although there were diverse dyads, no complete data was available to run the model. Thus, H2 could not be tested.

H3 Entrenchment has a negative impact on the relationship between difference in power and risk-seeking behaviour

Using a moderation analysis, the effect of entrenchment on CEO dyad decisions was tested. As the analysis yielded no significant moderating effect of entrenchment ($b = -.018$, $p = 0.386$) hypothesis 3 is therefore rejected. The entrenchment scores were not available for each of the companies in the sample. This led to a limited sample size for this test. Although big enough for an Areg analysis, it could be argued the sample was not representative for all companies with a co-CEO structure.

6. Conclusion and limitations

6.1 Conclusion

In this research the influence of a co-CEO structure on the company's risk appetite is examined. To accomplish this, empirical research was chosen to examine the effect of a difference in power on the leverage of the company in a period between 1995 until 2015. The literature review shows there is an adequate amount of literature available about the topics that concern this thesis. When it comes down to studying the co-CEO structure, the body of knowledge decreases to a handful of papers.

The literature shows that the power gap as a proxy for the unequal distribution of power between co-CEOs helps measure this difference in power, but it does not explain it. In most cases one of the CEOs is given slightly more power by the board of directors as a failsafe for stalemate decision in which the dyad cannot proceed (Krause, 2013). These measures might seem counterintuitive when compared to the positive effects of shared leadership between CEOs, but empirically this measure has been necessary.

Based on these papers it can be argued that a correlation between a power gap between co-CEO's and firm performance exists. The difference in power between these CEO's positively drives performance (Return on Equity (ROE)) for these companies. This was determined by Krause et al. (2013). Measuring the power gap and its effect on the company's ROE, the researchers found a curvilinear effect for the power gap. Too much difference in power drove performance down again.

The effect of a possible power gap on leverage was not yet explored. As the power gap positively influences firm performance, it could also determine the way a co-CEO dyad approaches risk and therefore leverage. From a shareholder and governance perspective this possible relationship is important.

When comparing the empirical results of this research with the research by Krause et al. for hypothesis 1, it became evident that there is a positive relationship between a power gap and risk appetite when dismissing the entrenchment index. In the article by Krause et al., the same relation was found, only with firm performance. Based on the literature review this result was expected, due to a causal relationship between risk seeking behaviour and firm

performance in the short run.

The expected limiting effect of gender diversity on risk seeking behaviour could not be tested due to a lack of gender-diverse co-CEOs in the sample. Like many studies on the effect of gender diversity this research suffers from a small sample, in this case zero, of diverse CEO dyads.

Moreover, the effect of specific governance measures for entrenchment could not be proven. The expectations of a negative impact of the entrenchment index on the relation between the power gap and risk appetite are not confirmed. The expected effect of the entrenchment measures would have been that these help regulate against too much risk seeking behaviour. The sample did not contain enough participants that were part of the RiskMetrics database.

It can be concluded that a power gap does influence the risk seeking behaviour of companies with a co-CEO structure. Though this influence is limited, this research could not identify factors that help limit the negative effects of difference in power between co-CEOs that would possibly be detrimental to the company.

Co-CEO structures in publicly traded companies are rare. Even those companies that embrace this leadership structure do so out of necessity and the situation is mostly temporary, because of a merger or a transition to a single CEO structure. The sample showed a limited amount of company years for the co-CEO dyads that were found. Companies that do show the structure over a longer period of time have co-CEOs that have strong family ties. Literature has shown these companies already demonstrate a lower risk seeking behaviour than other companies. Power gaps within these companies do lead to more risk seeking behaviour.

The co-CEO leadership structure shows to have a limited application in the companies in the sample. Even within this structure a power gap is present most of the time, due to differences in age, tenure, compensation or chairmanship. Not every CEO in the dyads are equal. The literature does not state equality is necessary, moreover the difference in power between co-CEOs drives firm performance. The aim of a CEO dyad should not be to create equality between CEOs but to make sure CEO power remains in check. A difference should exist to facilitate the performance sweet spot. From a governance point of view it is necessary that CEOs have the freedom to do what they feel is right, while their counterpart makes sure the company interest is served. Managing a slight difference between the two will enable continued company growth.

This research has several limitations. As such, the main restrictions for this research were caused by the datasets of Compustat and ISS (former Riskmetrics).

One of the large problems concerns the niche of this research. From the year 1995 until 2015, 500 unique CEOs were extracted from the database. With the co-CEO structure, every CEO had or has their counterpart (dyad), creating pairs of 250 observations ($500/2$). With a low number of observations, every missing data could have a significant impact on the research. In many observations, only few data were missing. However, there were some cases where it was necessary to approximate values.

When looking at debt, many values in Compustat were missing. Debt was an important variable to calculate the leverage of the company. To overcome this data gap, a leverage estimation was used to calculate leverage. Instead of the classical calculation of leverage, the formula that was used subtracted common equity from total assets and divided this amount with the total assets. Although an acceptable measure, this proxy for leverage does include short term debt, which is not necessary a measure for company risk taking.

The same problem was encountered with constructing the entrenchment index. Since submitting data in ISS is not mandatory, many gaps were created in the dataset, making the entrenchment index less reliable. Especially with the low number of observations, integrating the entrenchment index led to a less reliable model, as the index became inconsistent and insignificant in the results. The amount of usable data had diminished to approximately 30% of the original dataset.

Moreover, although it was possible to seek the missing data manually in the company's annual reports, Compustat and ISS do not state how they obtained their variables, possibly biasing the research. Due to this no action was taken.

In addition to the limitations of this research, there are aspects in the field of shared leadership that were not discussed, but are valuable to examine in the future.

For instance, there is still a great deal to discover in shared leadership. Although the co-CEO structure is a rare trait, it is not insignificant. From 1995 until now, co-CEO structures are present in organisations and this will probably also be the case in the future. However, the

lack of data appears to be a bottleneck in this research and therefore presents a challenge for future research. A beneficial to this type of research could be the collection of primary data outside of the US, for example in Europe and Asia.

Second, it is stated in the limitations that due to a potential bias, it was impossible to fill the gaps in the dataset with manual entries from the annual records. When expanding this research, it should be possible to create a more accurate research by replacing all the data from ISS/RiskMetrics with manually found data.

The third interesting field is comparing a co-CEO structure with companies that did not adopt such a structure and conduct a unity-of-command principle for leadership. Comparing these different types of leadership could possibly provide valuable insight for future leadership structures.

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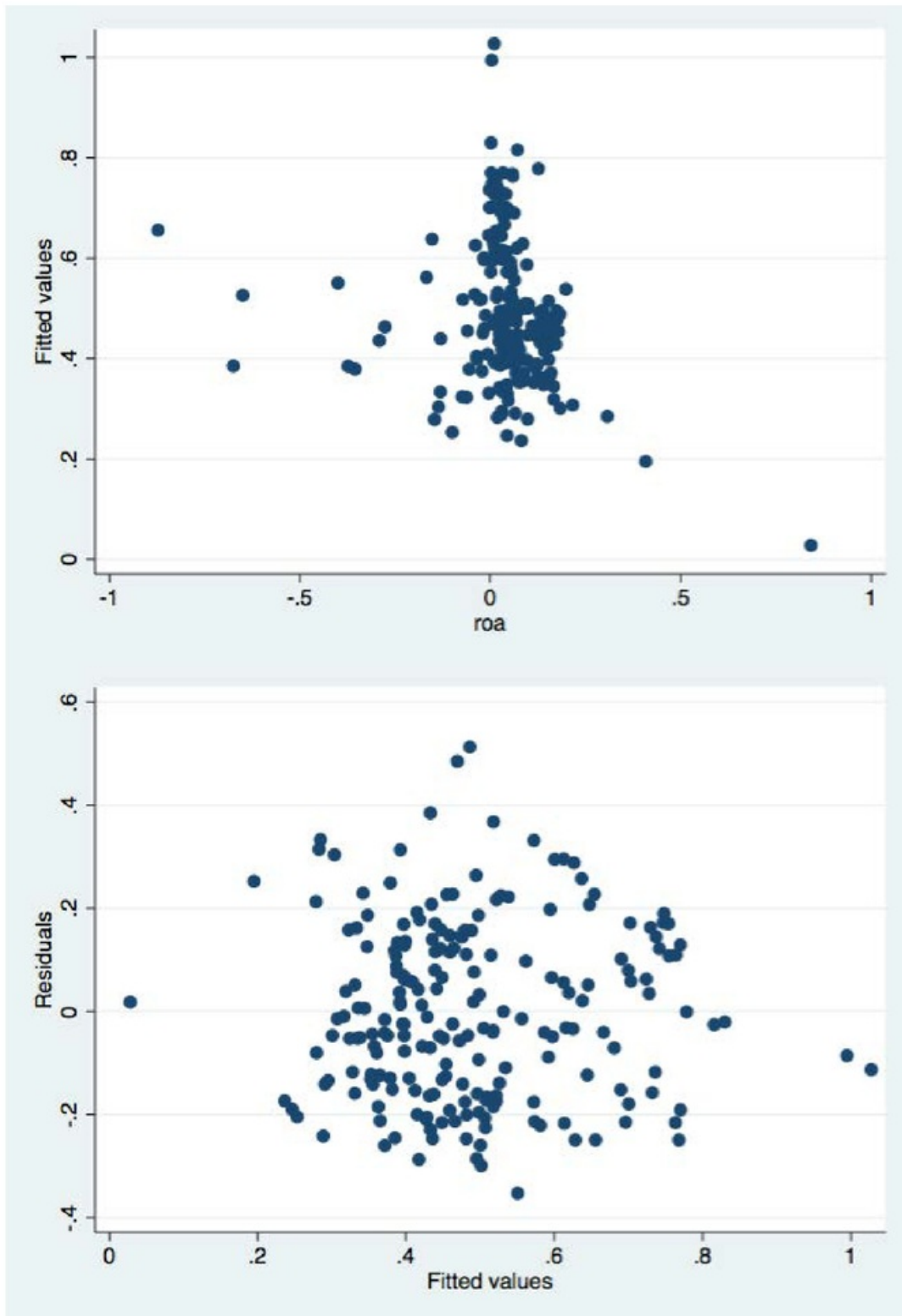
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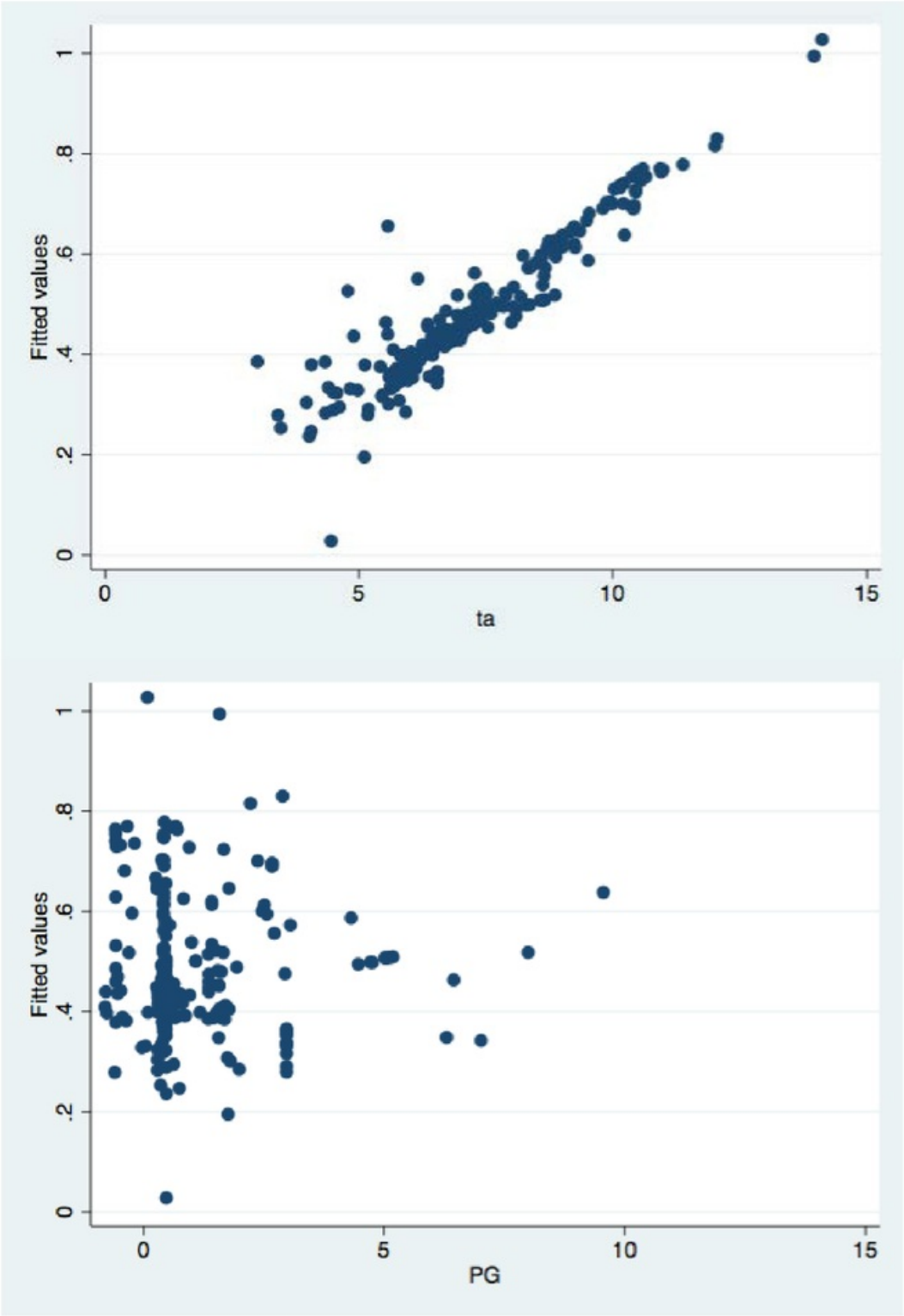
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Appendix I: Scatterplots





Appendix II: Hausman test

This table shows the results of a Hausman test to determine if fixed or random factors model is the most efficient for the dataset of this research. The results show that the fixed effects model is preferred.

53

	---- Coefficients ----		(b-B)	sqrt(diag(V_b-V_B))
	(b)	(B)		
	fixed	random	Difference	S.E.
PG	.0060915	.0034073	.0026843	.0038491
roa	-.0683059	-.0996925	.0313866	.0152499
ta	.0008166	.0464828	-.0456662	.0109782

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(3) = (b-B)'[(V_b-V_B)^(-1)](b-B)
 = 21.59
 Prob>chi2 = 0.0001

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