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Faculteit Bedrijfseconomische Wetenschappen

master in de handelswetenschappen

Masterthesis

Corporate governance en financiële prestaties

Milan Schruers

Scriptie ingediend tot het behalen van de graad van master in de handelswetenschappen, afstudeerrichting accountancy, financiering en fiscaliteit

PROMOTOR :

dr. Ruveyda KELLECI

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Preface

This study is about corporate governance and firm performance. The aim of the study is to estimate the link between internal mechanisms of corporate governance in an organization and the effects they have on the financial performance of the organization. The foundation of this thesis rests upon the contributions of countless scholars, researchers and thinkers who have paved the way for the ideas presented here. The goal of this thesis is to contribute to the growing literature and future research around the topic of corporate governance and firm performance.

This thesis represents the last phase of my master study Business administration with the specialization track finance at the university of Hasselt. Therefore, I would like to take the opportunity in this preface to thank some people in particular who supported me throughout this thesis and throughout my education. First of all, I would like to thank dr. Rüveyda Kelleci for her knowledge, guidance and support throughout my thesis. Her guidance and mentorship have been instrumental in refining this thesis. Her critical and valuable feedback always helped me when necessary, but I also got a lot of freedom which helped me grow throughout the process of writing my thesis. Secondly, I would like to thank my friends and family. Their support and encouragement has been very valuable during my academic career. Lastly, I would also like to thank all the professors and staff that have been involved in the degree of business administration. I enjoyed my time at the university of Hasselt.

Milan Schruers

Diepenbeek, August 2022

Resume

Het effect van *corporate governance* op bedrijven is een belangrijk onderwerp geworden in academisch onderzoek. *Corporate governance* verwijst naar het deugdelijk bestuur van organisaties. De opzet van dit onderzoek is om het effect van interne *corporate governance* mechanismen op de financiële prestatie van Belgisch beursgenoteerde bedrijven te onderzoeken. Onze onderzoeksvraag luidt: "Wat is het effect van interne mechanismen van *corporate governance* op de financiële prestatie van Belgisch beurgenoteerde ondernemingen?". Deze studie onderzocht het effect van een *audit committee*, *managerial ownership*, *CEO duality* en *board independence* op financiële prestaties gemeten via return on assets en tobin's q. De resultaten werden ook gecontroleerd voor f*irm size*, *firm age* en *industry type*. Voor het onderzoek hebben we een sample van 94 bedrijven, die aan de kwalificaties voldeden, onderzocht over een periode van 3 jaar. Elk bedrijf werd geanalyseerd voor de jaren 2019,2020 en 2021. De analyses zijn uitgevoerd via een random effects panel data regressie. Panel data combineert zowel *cross-sectional* als *time-series* data. We bekijken namelijk de effecten van interne *corporate governance* mechanismen op de financiële prestatie van 94 bedrijven over een periode van 3 jaar. In tegenstelling tot een standaard regressie analyse, waarin alle variabelen op een moment gemeten worden, kan panel data een causaal verband aantonen.

Zoals eerder vermeld, heeft dit onderzoek het effect van vier interne mechanismen van *corporate governance* op de financiële prestaties van Belgisch beursgenoteerde bedrijven onderzocht. Het eerste mechanisme was het auditcomité. De hypothese die getest werd, was dat de aanwezigheid van een intern auditcomité een positief effect op de prestatie zou hebben. Het tweede mechanisme was *managerial ownership.* Dat verwijst naar het percentage van aandelen dat in handen is van managers. Het mechanisme werd getest onder de assumptie dat *managerial ownership* een positief effect op financiële prestatie zou hebben. Als derde mechanisme werd *CEO duality* getest. *CEO duality* verwijst naar de situatie waarin de functie van *chief executive officer* (CEO) en de functie van voorzitter van de raad van bestuur door dezelfde persoon worden uitgevoerd. Het mechanisme werd getest onder de assumptie dat *CEO duality* de financiële prestatie negatief beïnvloedt. Het laatste mechanisme in de onafhankelijkheid van de raad van bestuurd. Er werd veronderstelt dat de onafhankelijkheid van de raad van bestuur een positieve invloed op de prestatie heeft. De financiële prestaties van de bedrijven werden gemeten door de ROA en Tobin's Q. Het gebruik van deze 2 ratio's maakt het mogelijk om de effecten op zowel accounting-gebaseerde als markt-gebaseerde bedrijfsprestaties te meten. Het gebruik van deze 2 verschillende methoden zorgt voor minder verstoring en meer accurate en betrouwbare resultaten.

Verder, worden hieronder de resultaten van het onderzoek besproken. Ten eerste laten de resultaten zien dat een auditcomité geen significante invloed heeft op de bedrijfsprestaties. Dat kan verklaard worden door het gebrek aan onafhankelijkheid of financiële expertise van het auditcomité. Wanneer het auditcomité niet volledig onafhankelijk is van ander management, kunnen haar bevindingen bevooroordeeld zijn. Verder kan het ook zijn dat de bestuursleden van het auditcomité niet over genoeg financiële geletterdheid beschikken en daardoor de kwaliteit van de auditcontrole afneemt. Ten tweede, voor *managerial ownership* tonen de resultaten geen significante invloed op de bedrijfsprestaties, zowel voor markt gebaseerde als boekhoudkundige metingen (d.w.z. Tobin's Q en ROA). Deze bevinding kan verklaard worden door overmatig *managerial ownership.* Eerder

onderzoek toont aan dat *managerial ownership* de belangen van managers en aandeelhouders eerst in lijn brengt, maar als managers te veel macht krijgen, de belangen weer afnemen. Managers gaan hun eigen belangen steeds meer nastreven, wat vaak korte termijn winst betekent terwijl een bedrijf eerder op lange termijn richt. Dat is dus nadelig voor de onderneming. Ten derde werden er ook geen significante effecten op de bedrijfsprestaties gevonden voor *CEO duality*. Deze bevinding is in sommige gevallen tegenstrijdig, maar in andere gevallen in lijn met eerder onderzoek. De hypothese werd getest voor het negatief effect van *CEO duality*, maar het kan namelijk zijn dat *CEO duality* niet of zelfs positief bijdraagt aan de bedrijfsprestaties. Het negatieve effect is gebaseerd op dat *CEO duality* te veel macht in handen van één beslissingsmaker legt. Echter, als de CEO van een bedrijf zeer competent is en beschikt over uitstekende leiderschaps-, communicatie- en besluitvormingsvaardigheden om de functies van zowel CEO als voorzitter met succes uit te oefenen, is er mogelijk geen verschil in bedrijfsprestaties tussen de scheiding of combinatie van zeggenschap. Ook het laatste bestuur mechanisme, de onafhankelijkheid van de raad van bestuur, heeft geen significant effect op de bedrijfsprestaties. Ondanks dat deze bevind tegenstrijdig is met sommige eerdere onderzoek, zijn er ook studies die dezelfde resultaten aantonen. De minimale impact van de raad van bestuur kan verklaard worden door het gebrek aan informatie of financiële expertise. De RvB dient accurate informatie te krijgen over de activiteiten van het bedrijf om goede beslissingen te maken. Daarnaast, moet de RvB bestaan uit competente leden, anders dreigt de kwaliteit eronder te leiden.

De bevinden van dit onderzoek zijn in sommige gevallen tegenstrijdig met eerder onderzoek. Maar de resultaten zijn in veel gevallen ook consistent met eerder onderzoek naar dit topic. Er zijn namelijk al eerdere studies die de effecten van deze *corporate governance* mechanismen op de financiële prestatie van bedrijven ook niet wisten te verklaren. *Corporate governance* is een groeiend begrip en academici hebben de exacte effecten ervan nog niet weten te bepalen. Echter, draagt deze studie bij tot de bestaande en groeiende literatuur over *corporate governance* en bedrijfsprestaties. Door recente gegevens van Belgische beursgenoteerde ondernemingen te onderzoeken en verschillende mechanismen van *corporate governance* te gebruiken, draagt deze studie bovendien bij tot de beperkte literatuur over dit onderwerp in de Belgische context. Hoewel verder toekomstig onderzoek noodzakelijk is, kunnen de bevindingen van deze studie nuttig zijn voor academische onderzoekers, studenten, bedrijven, leidinggevenden en beleggers bij het verklaren van de relatie tussen *corporate governance* mechanismen en de financiële prestaties van bedrijven.

Ten slotte, worden de beperkingen en aanbevelingen van dit onderzoek besproken. De eerste beperking van dit onderzoek was de beschikbare informatie. De financiële informatie van sommige bedrijven uit de steekproef ontbrak in de Belfirst-database. De ontbrekende gegevens werden vervolgens verkregen met behulp van de jaarverslagen van bepaalde bedrijven. Hoewel de bedrijven beursgenoteerd zijn, was de financiële informatie over voorgaande jaren niet altijd gemakkelijk te vinden. Ten tweede is de steekproefomvang ook een beperking. De steekproef van deze studie was groot genoeg volgens eerdere studies over steekproefgrootte en aangezien de studie Belgische beursgenoteerde ondernemingen observeerde, waren de mogelijkheden beperkt. De steekproefomvang is echter kleiner in vergelijking met andere studies van buiten België. Grotere steekproeven over een langere periode zullen nog significantere resultaten opleveren. We raden toekomstig onderzoek aan om te controleren voor de bevindingen die dit onderzoek heeft opgeleverd

wanneer deze interne mechanismen van *corporate governance* verder onderzocht worden. Verder, raden we ook aan om de effecten van andere *corporate governance* mechanisme te bekijken voor een steekproef van Belgische ondernemingen en zo de literatuur rond *corporate governance* in een Belgische context verder uit te breiden.

Abstract

This study examines the effects of four internal mechanisms of corporate governance on firm performance of Belgian listed firms. The internal mechanisms audit committee, managerial ownership, CEO duality and board independence act as the independent or explanatory variables. The dependent variable firm performance is measured by one market-based ratio (Tobin's Q) and one accounting-based ratio (ROA). Furthermore, the analyses include three control variables (i.e. firm size, firm age and a dummy for industry type). The sample was drawn from the Euronext Brussels Stock Exchange. 94 firms were analysed over a three-year period (2019, 2020, 2021) using the random effects panel data regression method. The results show that an audit committee does not significantly impact firm performance. For managerial ownership, the results show no significant impact on firm performance, for both market-based or accounting-based measurements (i.e. Tobin's Q and ROA). As for CEO duality also no significant effects on firm performance were found. Similarly, the last governance mechanism, board independence does not significantly affect firm performance. This study contributes to the existing literature on corporate governance and firm performance. Moreover, by examining recent data from Belgian listed companies and using various mechanisms of corporate governance, this study contributes to the limited literature on this topic in the Belgian context. While further future research is necessary, the findings of this study can be useful to academic researchers, students, businesses, executives and investors in explaining the relationship between corporate governance mechanisms and firm performance.

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1. Introduction

Corporate governance represents a key role in successfully running an enterprise and creating corporate value (Handayani et al., 2020). It is therefore important for enterprises and managers to have a good understanding of corporate governance and the impact on the financial performance of a company. Many studies have shown that good corporate governance and financial performance are positively related to each other (Aggarwal, 2013; García-Sánchez et al., 2022; Gill & Biger, 2013; Handayani et al., 2020).

Corporate governance is often described as the system of rules, practices and processes by which a firm is directed and controlled. The ISO 37000 defines good governance as a human-based system by which an organization is directed, overseen and held accountable for achieving its defined purpose in an ethical and responsible manner. Corporate governance aims at fulfilling the interests of an organization's many stakeholders. When a company successfully manages to satisfy the wishes of many stakeholders, it is ultimately creating corporate value (Cornell & Shapiro, 1987). A company or a brand does not survive without its stakeholders. So it is often said that corporate governance and financial performance go hand in hand (Aggarwal, 2013).

Previous studies have shown that good corporate governance makes an enterprise perform better and increases financial performance (Brown & Caylor, 2004; Mashayekhi & Bazaz, 2008). Handayani et al. (2020) tested the impact of four internal corporate governance mechanisms (managerial ownership, institutional ownership, independent commissioner and audit committee) on corporate value and concluded that good governance mechanisms affect firm value in a positive manner. Gill and Biger (2013) tested multiple hypotheses concerning corporate governance and the efficiency of working capital. The study shows that corporate governance improves the efficiency of working capital management. By improving the efficiency of working capital, the cost of working capital is reduced and firm value will increase. The research conducted by Gill and Biger (2013) found multiple positive relations between corporate governance and different determinants to measure the efficiency of working capital. In conclusion there is ample evidence on the relationship between corporate governance and financial performance.

However there are also some contradictions found in the research of corporate governance mechanisms and corporate value. For example, Lozano et al. (2016) found that managerial ownership, an internal mechanism of corporate governance, had a positive impact on firm value. On the other hand, Agustia et al. (2018) found that managerial ownership had no effect on corporate performance. So although there have been conducted a number of previous studies about the effect of corporate governance on financial performance, there has more research yet to be conducted in order to solve inconsistencies in findings about this topic. It is important for firms to know which rules, systems and actions create corporate value.

Furthermore there is no well-formed, clear answer about the effects of corporate governance mechanisms on the financial performance of firms in Belgium. To gain more insights, the goal of this study is to examine the effect of four internal corporate governance mechanisms on the financial performance of Belgian enterprises. The following research question has been determined:

What is the impact of internal corporate governance mechanisms on the financial performance of Belgian listed firms?

This study explores financial performance within companies and aims to investigate how internal mechanisms of corporate governance affect the financial performance of Belgian firms. The population of this study is a sample of Belgian listed enterprises. In this study four internal mechanisms of corporate governance will be applied as independent or explanatory variables (i.e. audit committee, managerial ownership, CEO duality, board of directors independency). Below we explain why we chose for these four mechanisms. First, an audit committee plays an important role in overseeing management. It increases the effectiveness of a board by controlling management decision making. It also assures that a company achieves its goals in an ethical and legal way by overseeing daily operations (Alzeban & Sawan, 2015). By monitoring the operations of a firm and the actions of managers and other executives, the audit committee serves as a control mechanism (Turley & Zaman, 2007). This builds investor confidence, ensures compliance and improves decision-making which is positive for a firm (Bhardwaj & Rao, 2015). Second, managerial ownership is defined as the percentage of shares held by the management who actively participate in corporate decisions including the commissioners and directors (Agustia et al., 2018). This corporate governance mechanism is important for the firm, because the decisions made by management directly impact firm performance. Besides, if the higher levels of decision making such as managers hold a lot of shares, their interests might be more aligned with the shareholders of the company. Managers with high stakes in the company, logically want the company to perform well and so do shareholders (Letza et al., 2004). So, high levels of managerial ownership align the interests of managers and shareholders better and reduce agency costs, which is positive for a company (Bhagat & Black, 2002). Third, CEO duality refers to a situation where the roles of CEO and chairman of the board of a certain company are exercised by the same person. This mechanism can affect firm performance in a negative way. The role of the board of directors is to control and advise top executives such as the CEO. With CEO duality present the board of directors may not have much influence. Furthermore the CEO can have too much power, resulting in one-way decision making (Duru et al., 2016). Therefore, it can be of importance that the CEO and the chairman of the board of a certain company are not the same person (Iyengar & Zampelli, 2009). This will be examined in this research study. The fourth mechanism of corporate governance is the board of directors. It is the duty of the board of directors to oversee management decision making. It is therefore important that directors of the board are independent from management (Jensen, 1993). Board independence will improve monitoring and controlling the management of the enterprise and make it more effective, efficient and unbiased (Yan Lam & Kam Lee, 2008). When the board of directors is strongly connected with management, their decision making can be biased, resulting in decisions with more regard to the managers than to the company. Board independence will be examined in this study as a mechanism of corporate governance (Li et al., 2015).

As mentioned before the dependent variable of this study is firm performance. In this study we use return on assets and Tobin's Q to measure firm performance, because we want to capture both accounting-based and market-based firm performance. The accounting-based measurement is based on historical data of the company, while the market-based measurement represents the expectations of future earnings. Capturing both methods provides a well-rounded, comprehensive and unbiased

assessment of firm performance (Dalton et al., 1999). Those measurements are a good proxy of firm performance and are often used in other studies (Berķe-Berga et al., 2017; Buallay et al., 2017; Duppati et al., 2019).

So, the relationship between corporate governance and firm performance has been a significant area of research the last couple of decades. Its multifaceted nature and potential implications have grasped the attention of academics, leading to a growing body of literature (Aggarwal, 2013; Arora & Sharma, 2016; Bhagat & Bolton, 2019b; Brown & Caylor, 2004; Buallay et al., 2017; Ciftci et al., 2019; Farooq et al., 2022; Handayani et al., 2020; Jesuka & Peixoto, 2022; Mashayekhi & Bazaz, 2008; Siddiqui, 2015). This article aims to contribute to the existing knowledge on this topic and is structured as follows, in chapter 2 we will discuss the existing literature to gain better insights of the various theories behind the topics examined in this study. Additionally, this chapter provides empirical evidence from prior studies and develops the hypotheses that will be tested in this study. In the following section, chapter 3, the research methodology is discussed. This section provides an outline of the sample used in this study, the research model and design used to test the hypotheses and the used variables. Furthermore, chapter 4 provides the results of the analyses, which will be discussed in chapter 5. Finally, chapter 6 gives the conclusions and limitations of this study, as well as the contributions to future research.

2. Literature Study

This chapter of the study reviews existing academic literature on the effects of and relation between corporate governance mechanisms and firm performance. The chapter is divided into sub-sections each explaining a different part of the topic. The first sub-section is dedicated to the general concept of corporate governance. Furthermore, the following three sub-sections explain different conceptual theories behind the concept of corporate governance. Lastly, the internal mechanisms of corporate governance used in this study, as well as the related hypotheses are presented.

2.1 Corporate Governance

Corporate governance is assumed to be an essential factor in ensuring that a company reaches its goals and satisfies its stakeholders and shareholders (Jia et al., 2019). Corporate governance is described as the set of rules, practices and processes by which firms are directed and controlled (Aggarwal, 2013; Cadbury, 1992). It is a monitoring, controlling, and directing mechanism for the board to oversee management actions and maximize stake- and shareholder value (Kusi et al., 2018). It is perceived that corporate governance is essential to assure corporate success as it guides a company in ethical and strategic ways (Payne & Moore, 2022). Corporate governance has both internal and external mechanisms. There are many internal corporate governance mechanisms, including the board of directors, managerial ownership, CEO duality, the role of the audit committee, independence from the board, etc. (Aggarwal, 2013). Besides the internal mechanisms of corporate governance, there are also external mechanisms. These external mechanisms operate from outside the organization and influence corporate governance systems, processes, and practices by top executives and board directors (Payne & Moore, 2022). For example government regulations are a popular form of external control. The government implies certain regulations that must be followed by companies in order to avoid penalties. Another example is the release of financial and non-financial statements to the public. In this matter the assessment of those statements by external parties makes sure companies report transparent, credible and aligned with actual performance (García-Sánchez et al., 2022). Thus, the internal mechanisms of corporate governance focus on internal control and monitoring. Whereas external mechanisms focus on issues related to the external market, laws and regulations. This study focusses on the link between internal corporate governance and firm performance.

The importance of corporate governance in corporate finance has increased significantly over the last few years (Aggarwal, 2013; Al-ahdal & Hashim, 2022; Pekovic & Vogt, 2021). Poor corporate governance has been identified as a major influencing factor in the global financial crisis (Kao et al., 2019). This is mainly because of the occurrence of corporate failure, which has led to corporate scandals and collapses. Well known examples of corporate failure include the collapse of the Enron, WorldCom and Satyam. These scandals have highlighted the importance of good corporate governance and have prompted scholars to conduct various typed of studies into the concept of corporate governance (Brickley & Zimmerman, 2010; Brown & Caylor, 2004; Ciftci et al., 2019; Setia-Atmaja, 2009). It is the goal of corporate governance to create transparency, disclosure, control and accountability (Mallin, 2016).

In general, academic studies regarding corporate governance focus on a few key areas. Mainly they examine how corporate governance mechanisms can be used to create stakeholder value, how they influence firm performance and how it affects corporate social responsibility. The key mechanisms corporate governance literature focuses on are the board of directors, managerial ownership, board size, audit committee, independence from the board and CEO duality (Al-ahdal & Hashim, 2022; Dalton et al., 1999; Duru et al., 2016; Kusi et al., 2018; Tejedo-Romero & Araujo, 2022).

2.2 Underlying theories

In the next part of the study, three underlying theories (i.e. agency theory, stewardship theory and resource-based view) will be introduced. These theories are relevant to explain the role of corporate governance within organizations and firms.

2.2.1. Agency theory

Corporate governance is the system of rules, practices and processes by which a firm is directed and controlled. That is one definition, but corporate governance is used so broadly that academic researchers find it difficult to come to one globally accepted definition (Brickley & Zimmerman, 2010). What researchers do agree about is that corporate governance is about justification (Shil, 2008). In this regard, the agency theory (Jensen & Meckling, 1976) becomes relevant. The agency theory states that share- and stakeholders cannot always trust their managers to take actions in the best interest of the company. Ross (1973) found that a shareholder's interest may not always be aligned with the interests of managers or agents. Therefore, corporate governance is necessary to motivate or make sure that agents and managers consistently act in the best interests of the firm or work towards share- and stakeholder value creation (Bonazzi & Islam, 2007).

The agency theory defines a relationship between one party (the agent) who executes actions on behalf of another party (the principal) (Keay, 2017; Ross, 1973). The principal has agents performing daily tasks and duties on his behalf. So, ultimately the principal is assumed to be one of the higher or the highest person within a firm. This does not mean that the principal has to be integrated into an actual position within the firm. For example shareholders are most commonly the principals (Jensen & Meckling, 2004). As they provide financial support to the firm to keep its day to day business running, shareholders are very important for a firm. Without them no business could be done. Therefore, one of the top priorities of a firm should be to satisfy the shareholders. This is often done in the form of an agency relationship. Principals (often shareholders) cannot make decisions directly within the firm, so they delegate the decision-making authority to agents.

Agents are likely to be top executives of the firm, think of the Chief Executive Officer (CEO), the Chief Financial Officer (CFO), high level managers etc. (Liu & Sickles, 2021). Agents execute tasks withing the firm on behalf of the principal. Principals rely on agents to perform, execute certain activities and most importantly set the right priorities. It is important that an agent makes the right decisions, because most of the decisions an agent makes affects the principal financially (Kostova et al., 2018). If an agent makes wrong decisions this may cause the company he/she works for to perform badly and this could mean a shareholder gets less dividends or the stock gets devaluated.

So a principal is in some way financially dependent of his agents. As a result agents and principals may have different priorities, different interests or different opinions about certain matters (Bebchuk & Fried, 2004). In other words when the visions of the principal and the agent are not aligned, it is often referred to as the principal-agent problem (Jensen & Meckling, 1976).

So when the goals of the agents are not aligned with the goals of the principals, there is a principal – agent problem at hand (Ni et al., 2017). This may cause various problems within the organization. For example agents can use their power to chase own short-term profit goals, instead of thinking about the long-term sustainability of the firm or they do not execute risks (for example, investments) that the principals tell them to execute, because they estimate the risk differently (Eisenhardt, 1989). The moral hazard problem (Arrow, 1968) also confirms this. It is first described in the insurance world. In the principal – agent problem, a moral hazard exists when the agent takes unusual risks or is unable to guard risks because he does not directly carry the consequences of the risks (Pauly, 1968). It is therefore important that agents are given the right incentives. If the agent is only compensated based on the outcome, they might not act accordingly to how the principal would want them to acquire the desired outcome (Shavell, 1979). Agents will sometimes even brighten up results in the accounting of the firm by leaving certain numbers out to wrongly satisfy principals (Shah, 2014). So, it is important to link the incentives of agents not only to the outcome of their actions, but also to the efforts they take (Shavell, 1979). Of course, the latter is difficult if the principal has no idea or insight over the agents day to day activities or actions, resulting in an information asymmetry (Popović et al., 2012). When principals have little control over what their executives and managers do, they cannot always trust them. Therefore, it is important that agents are being controlled in their day to day activities and are held accountable for their actions. That is why corporate governance is important (Mallin, 2016).

2.2.2 Stewardship theory

Stewardship theory is often presented as an alternative approach to agency theory (Davis et al., 1997). Some even argue that it is the complementary theory of the agency theory (Keay, 2017). Stewardship theory has a different approach to corporate governance. According to stewardship theory, corporate governance mechanisms should support and motivate rather than control agents (stewards) (Keay, 2017). Stewardship theory is a framework used by researchers to study the actions of executives who are motivated to act in the best interests of their constituents (Davis et al., 1997). The theory posits that executives, as stewards, will prioritize behaviors that benefit the organization over those that benefit themselves (Davis et al., 1997). They have a collectivistic vision and work toward achieving organizational goals. Doing so ultimately fulfills their personal needs. In other words directors who act as stewards want to do the right thing and act accordingly (Kluvers & Tippett, 2011; Stout, 2003). So, even if the interests and goals of stake- and shareholders (principles) and management (agents) do not align, the agents will try to achieve goals that benefit the company rather than their own goals (Davis et al., 2007). Stewards aim to create value for the organization they work for, rather than to destroy it (Davis et al., 1997). By following the stewardship theory, it is clear that corporate governance mechanisms should focus on supporting management, rather than controlling management. It is way more important to explain goals, be transparent and share the

right information with management through corporate governance, instead of holding them accountable for focusing on the wrong goals.

Furthermore, assuming the stewardship theory in corporate governance could lead to the false assumption that management (agents) acting in the best interests of shareholders (principals) also means that they are acting in the best interest of the organization. If management solely focuses on creating value for, thus working in the best interests of the, shareholders this could mean that they focus on short-term value creation and maximizing return for the investors. This, however, is not always in the best interest of the company. A company has many stakeholders besides the shareholders, such as employees and customers, whose interests are typically more long-term focused. Meaning those stakeholders will focus on the long-term value and existence of the organization. With this in mind, Madison et al. (2016) explained that it would be better to consider both the agency theory and the stewardship theory, than to assume them to be contradictory to each other. Human-beings do not always act rationally, it could be true for some agents to behave more like the stewardship theory and some agents to behave more as the agency theory. Thus, some agents focusing more on the organization and some agents focusing more on themselves.

2.2.3 Resource-based theory

The resource-based view presents a rich framework for analyzing the strategic resources that are key for creating competitive advantage over other firms (Zahra, 2021). The resource-based view was first introduced by Barney (1991). To create a competitive advantage a firm must implement strategies to use their internal strengths, take advantage of opportunities and protect the company against external threats (Barney, 1991). The board (an important internal mechanism of corporate governance) plays a crucial role in connecting the company with the necessary resources required to achieve maximum performance (Salancik & Pfeffer, 1980). The purpose of this theory was to provide researchers with insights into why certain firms, particularly those that are bigger and have been operating for longer periods, possess a competitive advantage that enables them to outperform other firms (Barney, 1991). The resource-based view is important to acknowledge in this study, because it is easily understood and fits well with corporate governance. The core message says that organizations should use their tangible and intangible resources to their advantage. Meaning that a company often possesses some unique resources, features or capabilities that other companies do not have. The resource-based view marks unique resources as resources that are difficult or impossible to replicate by a firm's competitors. Corporate governance, as explained above, refers to the set of rules, practices and processes by which a firm is directed and controlled (Cadbury, 1992). These corporate governance mechanisms come down to the highest level of a company (i.e. board of directors, audit committee, managers). According to the resource-based view, a company needs to understand their strengths and weaknesses and use resources to exploit opportunities and defend themselves from threats. In order to do so, an organization needs a management that is able to implement the right strategies fit for the organization. So the set of skills, experience and knowledge of managers can be viewed as an important resource for the firm (Khan, 2018). Corporate governance mechanisms are a key aspect in allocating resources and implementing the right strategies to create a competitive advantage (Strange et al., 2009). For example, the board of directors can play a vital role in making the right decisions. The audit committee can help with the

accountability and control of the management executives. Therefore, good corporate governance can help a firm to make the right decisions and implement necessary strategies to gain competitive advantage. The resource-based view can be of importance in understanding why there is need for certain governance mechanisms.

In the next part of the literature study, we will discuss the four different internal mechanisms of corporate governance that will be examined in this study for their effects on firm performance.

2.3 Internal corporate governance mechanisms

As previously spoken about in the literature, due to the hierarchical relationship between shareholders (principals) and top executives (agents) of a firm some agency problems may occur. This happens when the vision and goals of the agents are not aligned with the vision and goals of the principals. It is therefore important that agents get the right amount of control over their daily actions. Controlling executives and managers actions has to happen from inside the organization. That is why internal corporate governance mechanisms are developed. These mechanisms serve to solve the principal – agent problem and assure share- and stakeholders that the company acts in their best interests (Khan, 2011). This part of the literature study will discuss four internal corporate governance mechanisms that are used in the study of this thesis (i.e. audit committee, managerial ownership, CEO duality, board of directors).

In the literature around corporate governance various internal mechanisms of corporate governance are mentioned (i.e. board size, CEO duality, audit committee, executive compensation plans, performance evaluation systems, shareholders voting rights, internal audit functions, number of board meetings, independence from the board, etc.). In this study four internal mechanisms of corporate governance will be examined. These mechanisms were chosen, because of their frequent and valuable contribution in other studies about corporate governance and firm performance, as explained in the introduction of this study (Arora & Sharma, 2016; Buallay et al., 2017; Chen & Yu, 2012; Farooq et al., 2022; Jesuka & Peixoto, 2022; Li et al., 2007; Wahba, 2014).

2.3.1 Audit Committee

An internal audit committee can be very important for a firm as it has a wide variety of responsibilities. It helps a company, the share- and stakeholders of a company. It assures that the organization achieves its goals and satisfies its share- and stakeholders in a legal and ethical manner by controlling the daily activities, actions, processes and standards by which a company operates (Turley & Zaman, 2007). A lot of companies use both internal and external auditors. However an internal auditor can be crucial for an organization. An internal auditor knows more of the internal organization of a company than the external auditor (Schneider, 1985). An internal audit committee can perform more efficient and effective control of management, because of their close relations with the inside of a company (Cooper, 1993). The internal audit committee can be both preventive or detective (Lartey et al., 2020). On the one hand the committee evaluates systems and processes in order to optimize them and prevent errors from happening (Okpala, 2012). On the other hand the committee constantly observes and controls the processes, activities and actions to detect errors and solve problems (Aggarwal, 2013; Alzeban & Sawan, 2015).

Furthermore the importance of an internal audit committee is amplified by some negative implications that can occur using external auditors that may affect audit quality. Bell et al. (2015) argue two possible scenarios, social bonding and economical bonding. Social bonding means that an auditor can develop a friendly relationship with the client on a personal level, increasing the level of trust between the client and the auditor (Bell et al., 2015). This can cause the auditor to act less objectively and cloud professional judgement. Secondly, economic bonding means that the auditor can become financially dependent of the fees he gets from audit services provided for a certain client. Due to the financial situation the auditor may report to the client what they want to hear, instead of what the client needs to hear, reducing the audit quality (Bell et al., 2015). Both social and economic bonding, proves that internal audit outsourcing compromises independence from the audit committee (Bell et al., 2015).

The impact of an audit committee on firm performance was further researched by Daoud et al. (2015), who found that the presence of an audit committee has a positive impact on firm performance. Furthermore, another study conducted by Al-Okaily and Naueihed (2020) also found that an audit committee positively influences firm performance. There are a few reasons why an internal audit committee can have a positive impact on firm performance. Remember that the agency theory suggests stake-and shareholders do not always trust the capabilities, visions or decision-making of management (the agents) (Jensen & Meckling, 1976) and that management and owners may not always be on the same page and therefore information asymmetry can occur (Panda & Leepsa, 2017). By implementing an internal audit committee within a company, this problem can be solved. The audit committee can hold managers accountable for their actions and decisions. By holding management accountable, the audit committee improves transparency and oversight within the organization, a key element to reassure stake- and shareholders (Shah, 2014). The audit committee can also objectively evaluate the performance of management and assess management's compliance with rules and regulations. This reassures the shareholders, because they often fail to properly monitor them (Hemraj, 2004). The audit committee also improves the wealth of shareholders according to Choi et al. (2014), which indicates that the presence of an audit committee is positive for firm performance. If the audit committee is given accurate and objective information on a firm's day-to-day activities and operations, it can improve decision-making (Bhardwaj & Rao, 2015). The audit committee can provide guidance and valuable input to improve a firm's operations, risk management and strategic decision-making. An audit committee can also minimize the agency costs, because of its controlling and monitoring factor. Another study also found that the audit committee reduced internal controlling and monitoring weakness (Zhang et al., 2007).

In conclusion, the ability of the audit committee to control is positive for an organization. The audit committee is able to monitor executives and managers. The audit committee makes sure executives comply with the rules, implement the right strategies and work in the best interest of the company. The internal controlling ability of an audit committee builds investor confidence, ensures compliance, and improves decision-making. So, an audit committee will help a firm to perform better because it provides transparency and accountability. We hypothesize the following:

H1. An audit committee positively influences firm performance.

2.3.2 Managerial ownership

Managerial ownership refers to the extent in which equity shares of a certain firm are owned by its management team. This can include top executives, board members, and other key managers. When there is a high percentage of managerial ownership it may indicate that the management team has a high stake in the success of the organization, so it aligns shareholders and managers interests and places voting rights in the hands of corporate decision-makers in the firm (Rashid, 2016). On the other hand, a low level of managerial ownership may indicate that management is less invested in the company's performance and may not be as motivated to make decisions that benefit shareholders (Tejedo-Romero & Araujo, 2022). In conclusion, looking back at the agency problem, managerial ownership as a corporate governance mechanism contributes to partially solving the agency problem. By placing ownership capital into the hands of managers, who make important decisions on a daily basis, they will personally also benefit when their company is thriving. Therefore logically thinking, they will act rational and thus make decisions that are in the best interest of the firm (Ross, 1973). The agency theory can help to understand why managerial ownership can positively influence firm performance. In a certain way, if the managers of the company are also partially owner or have high stakes within the company, they will act as both agents and principal (Jensen & Meckling, 1976). While if managers have zero stake in the company, their decisions for the greater part only affects the stake- and shareholders of the company. The management of a company becomes an organ that is in control of other people’s money, rather than of their own. It cannot be expected that they will watch over the shareholder’s money with the same concern as for their own money (Eisenhardt, 1989).

A study conducted by Berķe-Berga et al. (2017) found that firms with higher levels of managerial ownership tend to have better financial performance, including higher returns on assets and higher profitability. The study suggests that this may be because managers who own a larger stake in the company have a stronger incentive to make decisions that will benefit the company as a whole, rather than just their own interests.

Another study conducted by Bhagat and Black (2002) found that firms with higher levels of managerial ownership tend to have lower levels of agency costs (i.e. the costs associated with aligning the interests of management and shareholders). This suggests that when managers have a larger stake in the company, they are more likely to make decisions that align with the interests of shareholders. The interest of the shareholders is of course that the company they have invested in performs well (Letza et al., 2004). So, if the interests of the managers are in the best interest of the shareholders of the company, this will most likely improve firm performance.

Furthermore a study conducted by Lasfer (2006), who studied the relationship between managerial ownership and board structure, found that a high level of managerial ownership will cause an organization to have a board that is unlikely to monitor. If there is a rise in the number of shares hold by management, firms are less likely to have non-executives on the board because the

managers will fulfill the roles as board members. Meaning the managers will monitor their own actions, without judgement from independent (non-executive) directors (Fama & Jensen, 1983). This may indicate that high levels of managerial ownership might not contribute positively to firm performance. If the board is unable to monitor the actions of management properly, managers will not be held accountable for their actions by the board of directors. This lack of accountability and feedback can result in poor decision-making, reduced transparency and financial mismanagement (Melis, 2005). This will most likely not result in better firm performance.

Overall, these studies suggest that managerial ownership can have a positive impact on firm performance as a corporate governance mechanism. However, it is important to note that the relationship between managerial ownership and firm performance is complex and may be influenced by other factors, such as the company's industry and the specific characteristics of the management team. The following hypothesis is presented:

H2. Managerial ownership has a significant positive effect on firm performance.

2.3.3 CEO duality

CEO duality refers to the situation where a single individual holds the positions of both the Chief Executive Officer (CEO) and the chairman of the board of directors of a company. This structure can lead to conflicts of interest and can make it more difficult for the board of directors to effectively oversee the actions of the CEO (Krause et al., 2014; Rechner & Dalton, 1991).

As the agent theory suggests, the board should be independent from management to prevent managerial entrenchment (i.e. a manager acting for his/her own benefit instead of acting in the best interest of the firm) from occurring (Eisenhardt, 1989). Therefore, some agency theoretical experts argue that separating the roles of CEO and chairman can lead to better corporate governance and better decision making for the company (Jensen, 1993; Krause et al., 2014).

Research suggests that CEO duality may have a negative impact on corporate performance. A study that examined over 17.000 firms through the period of 1997 and 2011, and selected 6848 observations that complied with the model, found a significant negative impact on firm performance when the power of decision-making is increased through CEO duality (i.e. when one person acts as both CEO and chairman of the board of directors). This may be due to increased power of the CEO and reduced accountability that comes by holding both positions as one person. (Duru et al., 2016; Tang, 2017). Another study suggests that firms chose CEO duality for other reasons than to boost firm performance. The study also finds when controlling for performance measures (i.e. market return and earnings per share) that CEO duality causes lower firm performance than when another chairman is assigned (Iyengar & Zampelli, 2009).

However, it should be noted that there are also studies that have found no significant difference in corporate performance between companies with CEO duality and those with separate CEOs and chairmen. For example, a study published in the Journal of Financial and Quantitative Analysis found

that CEO duality had no significant impact on company performance (Hitt et al., 2001). Another study that investigated the corporate governance impact of CEO duality, board independence and multiple large-shareholder structures in family firms found that the controlling power of family business owners created by CEO duality within the firm had a non-significant effect on firm performance (Goh et al., 2014).

Meanwhile a study on the effects of CEO duality on firm performance conducted in Hong Kong found that CEO duality positively influenced firm performance at non-family firms. The study argues that there are costs to CEO duality, but that the benefits a non-family firm experiences from CEO duality outweighs the costs. On the other hand family firms are according to the study better off with separating the function of CEO and chairman of the board (Yan Lam & Kam Lee, 2008). Others (Boyd, 1995) argue a positive impact, because duality enforces unity of leadership so visions of the individuals in companies are aligned, building more trusting relationships and improving decision-making. Therefore, facilitating organizational effectiveness.

In conclusion, the research on the effects of CEO duality on firm performance is mixed. Some studies find a significant negative impact, some studies find a positive impact and others find no significant impact at all. Some argue that the negative impact is due to an increase in power of the CEO and a decrease in accountability. Duru et al. (2016), who studied the role of CEO duality on firm performance with board independence as a moderating role, found that CEO duality negatively impacts firm performance. CEO duality has a negative and significant effect on firm performance especially when there is a small amount of independent directors on the board. So, if the CEO is also the chairman of the board, the decisions of the board might be biased and they might agree with the CEO too often. Resulting in a lack of accountability and poor decision-making. Therefore, I formulate the following hypothesis:

H3. There is a negative association between CEO duality and firm performance.

2.3.4 Board of Directors

A board of directors is a group of individuals who oversee the management of a company or organization. The board is responsible for making strategic decisions, setting policies and ensuring that the company is financially sound (Molz, 1985). Members of the board are elected by the shareholders of the company and may serve for a specific term, usually one or two years. The board typically includes a mix of company executives and outside experts, who bring a diverse range of skills and experience to the table (De Andres & Vallelado, 2008). The board is typically led by a chairman or chairwoman, who is elected by the other members of the board. The CEO of the company typically reports to the board of directors.

The board of directors is viewed as an important corporate governance mechanism as it holds a great responsibility in monitoring and controlling management, making decisions on behalf of the company (i.e. hiring, firing and compensating senior executives) (Molz, 1985). This is important as some scholars argue that accountability of directors is a key aspect of good corporate governance (Keay,

2017). Keay (2017) also argues that board accountability remains crucial, even when looking at the role of the directors through the stewardship theory. Directors who act as stewards work in the best interest of the firm regardless of their own interests (Davis et al., 1997). Nevertheless, board accountability remains important, because it acts as a control mechanism. Even stewards can make mistakes (Keay, 2017).

The board of directors has a few different aspects that get examined in the academic research between corporate governance and firm performance such as size of the board committee, board structure and board independence. A study conducted by Kao et al. (2019) found a positive relation between firm performance and the proportion of independent directors, smaller board size with a two-tier board system and no CEO duality.

In this study board independence will act as the fourth mechanism of corporate governance. As previously explained in the section of CEO duality, board independence can be of importance when the CEO needs to be held accountable or needs to get honest feedback (Duru et al., 2016) . Dependent board members sometimes agree with actions from the CEO or chairman of the board, although they don't necessarily think those are right. This can be explained because they are afraid of what will happen if they go against the CEO or chairman of the board. In the board meetings managers and other executives are perceived as equally important, but within the organization the CEO might be their superior executive (Banerjee et al., 2022). We look further into board independence in the following part of the study.

2.3.4.1 Board independence

Li et al. (2015) states that firm performance is positively influenced by board independence. This is not always the case. A study among 135 listed firms in Bangladesh found no significant positive link between board independence and firm performance (Rashid, 2018).

There are however some studies that posit a positive effect of board independence on firm performance (Liu et al., 2015; Mohapatra, 2016; Uribe-Bohorquez et al., 2018). The board of directors is responsible for evaluating the performance of managerial activities. This includes the performance of the CEO. The board is in charge of hiring, firing and compensating the CEO of an organization. If the chairman of the board is also the CEO, this task of the board can be biased and not fair (Tang, 2017). It creates too much power for the CEO. The reason behind this belief is that directors who are not affiliated with management are more likely to make unbiased decisions due to their legal obligations and lack of close ties to management. (Jensen, 1993; Yan Lam & Kam Lee, 2008).

When the board stands to close to the management within the firm, it might not be able to objectively monitor the situation properly while this is very important for share- and stakeholders (Duru et al., 2016). Independent board directors are able to perform independent close monitoring of the management and share it with share- and stakeholders (Eng & Mak, 2003). As mentioned before, according to the agency theory (Jensen & Meckling, 1976), it is important to monitor, control and

evaluate the actions of managers and other executives (agents). Board independence can also be linked to the resource-based view theory (Barney, 1991) mentioned earlier in this study. The resource-based view says that an organization can solely use their resources in the best, most efficient and optimal way if these resources are combined with the right strategies (Barney, 1991). In order to implement the right strategies, top executives of the firm have to know what is best for the firm. Furthermore they need to be able to implement those strategies objectively without the risk of being biased because they are too close to the organization (Fama & Jensen, 1983). Hence, if the board of directors are independent the less biased their decisions will be.

In conclusion, board independence has a positive influence on firm performance because it enables large shareholders to access more information (Eng & Mak, 2003), which in turn helps to prevent agent opportunism. This is because when the board is independent, outside parties have the information they need to evaluate the actions of agents (Jensen, 1993; Yan Lam & Kam Lee, 2008). Because of this, board independence can have a positive effect on firm performance. The following hypothesis is formulated:

H4. Board independence positively influences firm performance.

2.4 Hypothesis summary

The four hypotheses that will be tested during this research, are summarized in figure 1:

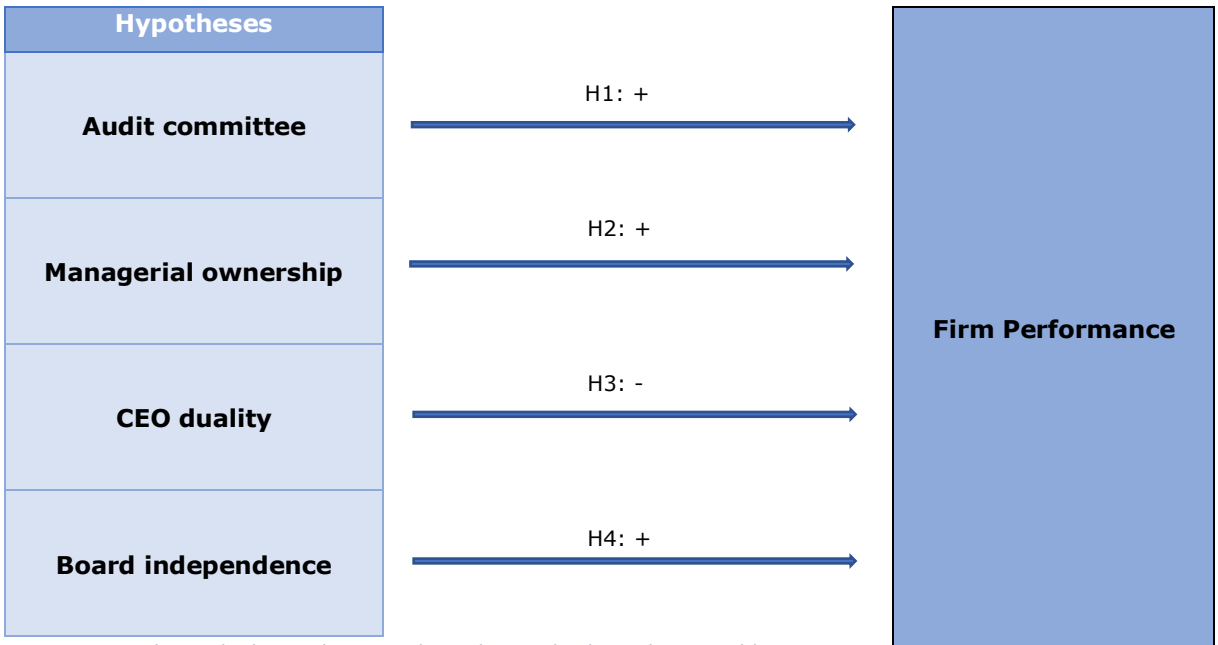

Figure 1: Hypothesized relations between dependent and independent variables

3. Research methodology

3.1 Sample context

The sample used in the study contains a number of listed firms in Belgium. Specifically, firms listed on the Euronext Stocks Brussels Exchange database. The Brussels stock exchange consists of 172 listed firms. This study focusses on Belgian listed firms on the Brussels stock exchange, so for a company to be included it must be grounded in Belgium. After elimination of foreign grounded firms listed on the Brussels stock exchange, we are left with a sample of 128 companies. Furthermore, following previous academic research around this topic, financial firms are excluded from the sample (Setia-Atmaja, 2009). Financial firms are excluded from the sample because of their unique financial reporting. Mostly bank institutions and insurance companies were eliminated from the sample. After eliminating unsuited enterprises from the sample, we are left with 116 companies. We used the database Belfirst, which contains comprehensive information on companies in Belgium and Luxembourg, to gather the necessary data in order to conduct this research. The ultimate sample consisted of 94 firms as some firms had to be removed due to missing data.

3.2 Sample size

The population used in this study is that of listed Belgian companies. With notice of prior studies (Kao et al., 2019; Tata & Sharma, 2012; Wang et al., 2020) on the effects of corporate governance on firm performance, financial firms (i.e. banking firms, insurance companies etc.) are excluded from the sample because of their unique regulations and financial reporting. According to Raykov and Widaman (1995) it is advisable to have a larger sample size compared to the number of parameters being estimated in a given model, with a ratio of 10 observations per estimated parameter. This means that as the complexity of the model increases, the minimum sample size needed also increases. In this study 8 parameters are used to examine the effects of corporate governance on firm performance. As discussed in the introduction, two dependent variables to measure firm performance (i.e. Return on assets and Tobin's Q). Since both ROA and Tobin's Q are dependent variables, two different regressions will be run each with one of the dependent variables. Therefore, the dependent variable acts as one parameter. In each regression four independent variables of internal corporate governance mechanisms (i.e. audit committee, managerial ownership, CEO duality and board independence) will be included, as well as three control variables (i.e. firm size, firm age and industry dummy). This means that our sample must consist of at least 80 observations (Raykov & Widaman, 1995). Since our sample consists of 94 companies, this study meets the requirements.

3.3 Research design

The research conducted within this study is of quantitative nature. Four different internal mechanisms of corporate governance (i.e. audit committee, managerial ownership, CEO duality, board of directors: more specifically board independence) will be tested for their impact on firm performance. Therefore, the corporate governance mechanisms will act as independent or explanatory variables, while one accounting-based and one market-based measurement of firm performance (i.e. return on asset & Tobin's Q) will act as the dependent variables. Furthermore, three control variables (i.e. firm size, firm age and industry type) are included in the analyses.

Given that the data is a set of panel data from a number of different firms, the panel estimation approach is utilized to take advantage of the combination of both cross-sectional and time-series characteristics of the data (Kao et al., 2019). This is explained further in the following section.

3.3.1 Panel Data Regression Analysis

As mentioned earlier this research paper estimates the effects of internal corporate governance mechanisms on firm performance, where the internal mechanisms of corporate governance will act as the independent or explanatory variables and both accounting-based and market-based measures of firm performance will act as dependent variables. In order to investigate these effects with the right analysis we have to break down our different types of data. We can distinguish two different types of data. On one hand we have cross-sectional data (Anselin, 1988) because we are observing units (i.e. individuals, households, firms, countries etc.) at a particular time (i.e. 2019). In our study the units observed are the different firms from our sample. On the other hand we want to include time series data in our study to increase the complexity of the analysis and increase the effectiveness and efficiency of our study (Baltagi & Li, 2004; Case, 1991). This means that this study observes a phenomenon for a country over a period of time. By including the time series effects of data in our analysis we get a more accurate and effective perspective of the effects of corporate governance on firm performance. When we measure the effects and estimate solely for a given time (i.e. 2019), the results might be biased if some firms performed extraordinary poorly in that particular year. Instead this study measures the effects of internal corporate governance mechanisms on firm performance over a period of three years (i.e. 2019, 2020, 2021). By combining both cross-sectional data and time series data, we get panel data (Balestra & Nerlove, 1966; Mundlak, 1961). Panel data refers to the pooling of observations on a cross-sectional of observed units (i.e. individuals, households, firms etc.) over several time periods (Baltagi & Pirotte, 2013; Koop & Steel, 2001; Kumbhakar & Lovell, 2003). This study pools the observations on a cross-sectional of firms over three years.

Furthermore, there are also different types of panel data (i.e. micro panels, macro panels). Micro panels typically have a large N and a fixed T, while macro panels typically have a large T and fixed N (Baltagi & Baltagi, 2008). Where N refers to the number of units being observed and T refers to the time dimension. In this study we are dealing with a micro panel, where N = 94 and T = 3.

3.3.2 Advantages of using panel data

There are also a couple of benefits for using panel data over for example standard regression analysis. These benefits also link to the increased complexity panel data analysis brings to the data being observed and examined (Baltagi & Baltagi, 2008). The first benefit of panel data is that we are able to control for individual heterogeneity. Individual heterogeneity means that the individual units (i.e. firms) in our sample differ from each other. We are not interested in these differences, but we need to control for them to get unbiased results. Studies using standard regression cannot control for individual heterogeneity and risk getting biased results (Moulton, 1986). As mentioned above we include a period of time into our model. Another benefit of panel data therefore is that we can analyze change over time. Panel data also provides more informative data, more efficiency and less collinearity between the variables because our information does not come from one unit (i.e. company) but rather from a sample of multiple firms.

3.4 Method of analysis

In this paper our research question, as mentioned in the introduction, is:

What is the impact of internal corporate governance mechanisms on the financial performance of Belgian listed companies?

In other words: *Does a number of internal corporate governance mechanisms impact firm performance?* To estimate if there is any impact between the two variables a linear ordinary least squares (OLS) regression is sufficient.

$$FP_{i,t+1} = \beta_0 + \beta_1(audit\_committee_{i,t}) + \beta_2(managerial\_ownership_{i,t}) + \beta_3(ceo\_duality_{i,t}) + \beta_4(board\_independence_{i,t}) + \beta_5(firm\_size_{i,t}) + \beta_6(firm\_age_{i,t}) + \beta_7(industry\_dummy_{i,t}) + \varepsilon_{i,t}$$

Where:

- $FP_{i,t+1}$ = Firm performance of firm i in year t;
- β_0 = constant;
- $audit\_committee_{i,t}$ = audit committee of firm i in year t;
- $managerial\_ownership_{i,t}$ = managerial ownership of firm i in year t;
- $ceo\_duality_{i,t}$ = CEO duality of firm i in year t;
- $board\_independence_{i,t}$ = board independence of firm i in year t;
- $firm\_size_{i,t}$ = size of firm i in year t;
- $firm\_age_{i,t}$ = age of firm i in year t;
- $industry\_dummy_{i,t}$ = industry type of firm i in year t;
- $\varepsilon_{i,t}$ = error term of firm i in year t

However, this study aims to capture the effects of the regressors on firm performance of the units (i.e. firms) observed over a time period of three years. This most likely concludes that, as mentioned before, the data used in this study is a set of panel data. Meaning the linear OLS regression method is too limited for our set of data. To summarize, statistical textbooks often explain that panel data consists of three main attributes that make it more complex than other types of data (Arellano, 2003; Wooldridge, 2002). The different attributes are explained below, with exemplification of how these attributes translate to this study:

1. The same units (i.e. Belgian listed firms) are observed repeatedly.
2. Multiple variables of the same units are measured (i.e. four independent variables measuring corporate governance and two dependent variables measuring firm performance).
3. The observations are made throughout multiple points in time or over a period of time (i.e. three years).

3.5 Breusch-Pagan Lagrange Multiplier

To test whether a panel data regression analyses is required rather than a standard linear ordinary least squares regression, we need to test the data (Alodat et al., 2022). The test used to estimate which method is suited is called the Breusch-Pagan Lagrange Multiplier test for heteroskedasticity (Breusch & Pagan, 1979). The Breusch-Pagan test uses an additional regression model that exercises the relation between the squared residuals to the independent variables in the standard regression model (Breusch & Pagan, 1979). The additional model tests if there is no relationship between the residuals and the independent variables, this implies homoskedasticity rather than heteroskedasticity. The statistic equation for the additional regression model used in the Breusch-Pagan test is presented below:

$$\varepsilon^2 = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + u$$

Where :

- ε^2 = the value of the squared residuals;
- x_1, x_2, x_3, x_4 = the independent variables (i.e. mechanisms of corporate governance);
- $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$ = the coefficients of the independent variables;
- u = the error term in the additional regression model

The Breusch-Pagan model estimates the relationship between the squared residuals and the independent variables (Breusch & Pagan, 1979). The R-squared value (R^2) can be obtained from the additional regression and measures the proportion in variance between the squared residuals that can be explained by the independent variables. The R-squared is calculated as follows:

$$R^2 = 1 - \frac{SSR}{SST}$$

Where :

- SSR = the sum of the squared residuals;
- SST = the sum of the distance between the data and the mean all squared

The R-squared is important because the Breusch-Pagan test uses it in the Lagrange Multiplier (LM) (Aitchison & Silvey, 1958). Hence, the full name Breusch-Pagan Lagrange Multiplier Test. The calculation of the Lagrange Multiplier is displayed below:

$$LM = N * R^2$$

Where :

- N = the sample size;
- R^2 = the value of R-squared

The LM follows a chi-squared (χ^2) distribution. So, by comparing the LM value to the critical value from the chi-squared distribution, the null hypothesis is either accepted or rejected (Breusch & Pagan,

1979). The null hypothesis states that there is no significant difference between the units (i.e. firms) that are being observed. This means that the variance across the units within the sample is considered to be equal to zero. In that case a standard OLS regression would be sufficient, because given the assumption that the variance of the residuals does not depend on the independent variables, the variance can be estimated from the average of the squared value of the residuals (Hayes & Cai, 2007). Specifically, the null hypothesis is accepted if the p-value of the test is greater than 0.05. This means that a standard OLS regression is sufficient. However, if the p-value is less than 0.05, we reject the null hypothesis. The null hypothesis states that there is a constant variance among the residuals. Rejecting the null hypothesis implies that there is heteroskedasticity present in the data, meaning that the variance of the errors among all the observations is not constant (Breusch & Pagan, 1979). Ultimately, the observations having the same variance in their errors is a crucial requirement for OLS regression. So rejecting the null hypothesis of the Breusch-Pagan Lagrange test implies that panel data regression analysis is more appropriate for the dataset (Breusch & Pagan, 1979). For this study, rejecting the null hypothesis would indicate that the regression model used to analyze the data should be panel data regression instead of OLS regression.

3.6 Types of Panel Data Models

Our data exists both cross-sectional and time series data. By using panel data regression, we can capture the effects far more effectively and efficiently (Baltagi & Baltagi, 2008). There are three different types of panel data regression methods.

1. Pooled OLS regression
2. Fixed effects regression
3. Random effects regression

The pooled OLS method approaches the standard linear OLS regression, because it ignores the impact of time and individual dimensions on the data (Schmidheiny & Basel, 2011). Therefor pooled OLS regression will not be used to estimate our set of data.

$$y_{it} = \beta_0 + \beta x_{it} + \varepsilon_{it}$$

A panel data model takes the error component of the pooled OLS regression and breaks it down into two components of the error term. Where u_i stands for differences among individual units in our data that are observable or unobservable but are consistent over time, we call this the fixed effects. v_{it} stands for the remaining error term, the idiosyncratic error term. The breakdown of the error term is presented below:

$$\varepsilon_{it} = u_i + v_{it}$$

By incorporating this split of the error term into our statistical analysis, we get the formula for the general linear panel data model. The OLS regression method mentioned above does not take the u_i factor of the error term into account, therefor the ordinary least squares regression method can be biased and inconsistent if there is a correlation between the fixed error term u_i and the independent or explanatory variables. The general panel data regression (Yaffee, 2003) model is displayed below:

$$y_{it} = \beta_0 + \beta x_{it} + u_i + v_{it}$$

3.6.1 Fixed vs. Random Effects Method

Furthermore, panel data analysis makes a distinction between two different methods for exercising the analysis. The fixed effects method and the random effects method (Schmidheiny & Basel, 2011). The random effects method, also called the random intercept or partial pooling model, assumes the variation across entities (i.e. firms) to be random and uncorrelated with the regressors (Raudenbush, 1994). This means that there is no correlation between the error term u_i (i.e. the unobservable individual effects that are fixed over time) and the independent or explanatory variables x_{it} (i.e. internal mechanisms of corporate governance):

$$cov(u_i|x_{it}) = 0$$

The fixed effects method, also known as within estimator, least squares dummy variable or the covariance model , on the other hand assumes that the characteristics unaffected by time (time-invariant) are perfectly collinear (in line with each other) with the unit (i.e. firms) dummies (Hedges, 1994). Meaning that the error term that we are controlling our model for u_i (i.e. the unobservable individual effects that are fixed over time) is correlated with the independent or explanatory variables x_{it} (i.e. internal mechanisms of corporate governance):

$$cov(u_i|x_{it}) \neq 0$$

To make sure which method is best for the sample in the panel data regression analysis, the data has to be tested. Hausman's specification test is typically used in panel data regression analysis to test which panel data model is appropriate for the dataset, the random effects model or the fixed effects model (Hausman, 1978). In order to run the specification test, two hypotheses are assumed. On one hand we will state that the random effects model is appropriate for our data, this will be the null hypothesis. On the other hand we will state that the fixed effects model is appropriate for our data, this will be the alternative hypothesis. By running the Hausman's test we estimate which of the hypothesis to accept and to revoke. We test for the p-value. If the p-value of the test is greater than 0.05, we accept the null hypothesis. Meaning that the random effects model is the most appropriate and efficient method for our data. If the p-value of the test is smaller than 0.05, we accept the alternative hypothesis. This implies that the fixed effects method is preferred and consistent without data:

- *H0. Random effects model is consistent → accept if p-value > 0.05*
- *Ha. Fixed effects model is consistent → accept if p-value < 0.05*

However, the Hausman's specification test is not necessary, because the fixed effects method is not appropriate for our dataset. This is due to the fact that the sample used in this study has time-invariant independent variables and the fixed effects model omits time-invariant variables because of collinearity (Baltagi & Baltagi, 2008). Therefore, the random effects model is the correct model to test the dataset.

Using the random effects model has some advantages and disadvantages. The random effects model is more efficient than the fixed effects model under the assumption that that there is no correlation between the error term u_i and the independent variables x_{it} , because the random effects model estimates both within and between information (Schunck, 2013). So, it uses more information than the fixed effects model to estimate the significance of the independent variables. Furthermore, the random effects model is able to estimate the coefficients of time-invariant covariates, while the fixed effects model is not (Stiratelli et al., 1984). This will be more appropriate for our dataset, since most independent variables do not change over time. The disadvantage of using random effects can be that the model is not consistent when there is no strong exogeneity between the dependent and independent variables (Mundlak, 1978). Exogeneity means that the independent variables do not depend on the dependent variable, but rather that the dependent variable depends on the independent variables and the error term. Since, we estimate the effects of independent variables (i.e. corporate governance mechanisms) on the dependent variable (i.e. firm performance), this will be true.

3.7 Research model

In this study the random effects model is used to test the hypotheses and estimate the effects of four internal mechanisms of corporate governance (i.e. audit committee, managerial ownership, CEO duality and board independence) on firm performance. The change in firm performance over the time period is measured with one market-based ratio (i.e. Tobin's Q) and one accounting-based ratio (i.e. ROA). The random effects model is therefore tested twice, each time with a different ratio (i.e. Tobin's Q, ROA) of firm performance as the dependent variable. The random effects model is displayed below.

$$FP_{i,t+1} = \beta_0 + \beta_1(audit\_committee_{i,t}) + \beta_2(managerial\_ownership_{i,t}) + \beta_3(ceo\_duality_{i,t}) + \beta_4(board\_independence_{i,t}) + \beta_5(firm\_size_{i,t}) + \beta_6(firm\_age_{i,t}) + \beta_7(industry\_dummy_{i,t}) + u_i + v_{it}$$

Where :

- $FP_{i,t+1}$ = Firm performance of firm i in year t;
- β_0 = Constant;
- $audit\_committee_{i,t}$ = Audit committee of firm i in year t;
- $managerial\_ownership_{i,t}$ = Managerial ownership of firm i in year t;
- $ceo\_duality_{i,t}$ = CEO duality of firm i in year t;
- $board\_independence_{i,t}$ = Board independence of firm i in year t;
- $firm\_size_{i,t}$ = Size of firm i in year t;
- $firm\_age_{i,t}$ = Age of firm i in year t;
- $industry\_dummy_{i,t}$ = Industry type of firm i in year t;

- u_i = Time constant observable or unobservable specific effects of firm i;
- v_{it} = Remaining random error term of firm i in year t

3.8 Data collection

In order to analyze the firms in the used sample, it is important to collect the correct and accurate data for every individual observation (i.e. firm). This study started with all firms listed on the Euronext Brussels. After eliminating companies that did not fit the requirements for this study, 116 companies remained. Thereafter, the right data had to be acquired for each individual company. Meaning the information of the four independent variables (i.e. audit committee, managerial ownership, CEO duality and board independence), the control variables (i.e. firm size, firm age and industry dummy) and the information to estimate the dependent variable firm performance (i.e. Tobin's Q and ROA). This was achieved by using the Belfirst database. Companies with incomplete information were further eliminated from the sample. In total, there were 94 firms used in the further analysis.

3.8.1 Dependent variables

The annual reports of listed Belgian companies are open to the public. The sample of this study is restricted to listed companies, so the data to estimate financial performance of the companies observed in this study is publicly accessible. The data is obtained through the Belfirst database, where most information of the companies is found. For some companies the financial data required to calculate firm performance was not available through the Belfirst database. However, since our sample uses publicly traded companies the missing information is obtained by analyzing their annual reports. Firm performance acts as the dependent variable in this study. In similar studies, researchers use one or more financial metrics to measure firm performance. These metrics often include Return on equity (ROE), Return on assets (ROA), Tobin's Q (Bhagat & Bolton, 2019a; Buallay et al., 2017; Ciftci et al., 2019; Farooq et al., 2022; Jesuka & Peixoto, 2022). Following prior studies (Berķe-Berga et al., 2017; Buallay et al., 2017; Duppati et al., 2019; Noguera, 2020; Shahwan, 2015), ROA and Tobin's Q are also used in this study to measure firm performance. Return on assets is an accounting-based measure. It measures how efficiently a firm uses its assets to generate profits. The other metric used to measure firm performance is Tobin's Q. Tobin's Q is a market-based metric. It measures whether a firm is relatively over- or undervalued. This study uses both accounting-based and market-based methods to measure firm performance. This because previous studies note that a single performance indicator can be specious and therefore create a biased view of firm performance (Ciftci et al., 2019; Farooq et al., 2022; Siddiqui, 2015). According to Dalton et al. (1999) the limitations of using solely accounting-based measurements are that they can suffer manipulation through accounting and consolidation. On the other hand using only market-based measurements can also create a biased view, because market-based measurements can be affected by investor anticipation. Hence, this study uses both measurement methods to avoid a biased view of firm performance.

3.8.1.1 Return on assets

Return on assets (ROA) is an accounting-based financial metric that measures how much profit an organization is able to generate from its assets. The ROA is calculated by dividing a firm's net income by the average of its total assets in a certain year ("Investopedia Stock Analysis: What is the formula for calculating return on assets (ROA)?," 2015). The net income of a company is calculated by subtracting taxes from a firm's earnings before taxes (EBT) of that year. The average total assets is calculated by taking the sum of the value of a firm's assets at the beginning of the year and at the end of the year, divided by two. Most of the studies found on this topic use this method of calculating the return on assets (Buallay et al., 2017; Ciftci et al., 2019; Farooq et al., 2022; Jesuka & Peixoto, 2022). The ROA is used in this research paper as a dependent variable to estimate firm performance.

3.8.1.2 Tobin's Q

Tobin's Q is a market-based indicator for firm performance. Other than the accounting-based measures, Tobin's Q reflects the market assumptions of a firm's performance. Tobin's Q is calculated as the total market value of a company, also called the market capitalization of a company divided by the total asset value of a company. In other words Tobin's Q describes the relationship between the market value and the intrinsic value of a company. By comparing these values, one can estimate whether a company is overvalued or undervalued. As mentioned earlier, it is important to use a combination of accounting-based and market-based measurements (Dalton et al., 1999). Tobin's Q is often used in previous studies (Arora & Sharma, 2016; Buallay et al., 2017; Ciftci et al., 2019; Farooq et al., 2022; Jesuka & Peixoto, 2022). Therefore, it is also used in this research paper as a dependent variable for firm performance.

Measures of firm performance	
Return on Assets	• Return on Assets (ROA) = Net Income ÷ Average Total Assets • Net Income = Earnings Before Taxes (EBT) – Taxes • Average Total Assets = (Beginning Total Assets + Ending Total Assets) ÷ 2
Tobin's Q	• Total market value of company ÷ Total asset value of company

Figure 2: formulas used to calculate firm performance

3.8.2 Independent variables

The independent variables used in this research are four internal mechanisms of corporate governance. The four internal mechanisms being studied are audit committee, managerial ownership, CEO duality and the independence of the board of directors. The methods of measuring these variables are discussed below.

3.8.2.2 Audit Committee

The audit committee is measured as a dummy variable in our analysis. As described in the literature review and hypothesis an audit committee can have a positive impact on firm performance as it controls various operations, managers and executives within a company. By providing independent control of the internal operations of a company, the management and executives and reviewing the risks of a company, the audit committee acts as a reliable and trustworthy governance mechanism. The presence or absence of an audit committee within the companies of the sample is therefore measured as follows: 1= when the company has an internal audit committee , 0 = when the company does not have an internal audit committee (Daoud et al., 2015).

3.8.2.3 Managerial Ownership

The second internal mechanism of corporate governance is managerial ownership. From previous studies and literature managerial ownership is considered to have a positive impact on firm performance, because by giving management stakes in the company their interests and incentives become aligned with the goals of other stake- and shareholders. Therefore managers will act in the best interest of the firm, the best interest of stake- and shareholders and the agency problem can be partially solved. Managerial ownership is measured by the percentage of shares held by management (Berķe-Berga et al., 2017).

3.8.2.4 CEO Duality

CEO duality was chosen for this study as the third mechanism of corporate governance. CEO duality is present within a company when the chief executive officer (CEO) of that company is also the chairman of the board of directors. Meaning that a single person holds a high amount of power within a company, as the CEO is generally in charge of managing day-to-day operations. While the chairman of the board is responsible for more long-term, overall strategic decisions and accountability of the decisions towards stake- and shareholders. As mentioned earlier, holding too much power is assumed as a negative by previous studies and there for also in this study CEO duality is assumed to have a negative impact on firm performance. Like the presence of an audit committee, CEO duality is also measured as a dummy variable: 1= when in the company observed the CEO is also chairman of the board, 0= when in the company observed the CEO and the chairman of the board are two different persons (Duru et al., 2016).

3.8.2.5 Board Independence

The last mechanism of corporate governance is the board of directors. More specifically the independence of the board of directors. Board independence refers to the number of non-executive directors on the board of directors. When the number of non-executives becomes greater than the number of executives on the board, it becomes more and more independent. This can have an influence on firm performance, because of the control the board of directors holds over management and other executives (the agents) of a firm. If the board of directors consists of a high number of executives, the board might be biased because the executives can influence decisions made by the board. Furthermore the board of directors also holds a responsibility to report to the stake- and shareholders of a company. When the board of directors is very dependent (meaning a high number of executives on the board), this may lead to biased reporting as well. The executives will try to make the situation of the company look better than it actually is, because they might be scared of

what will happen to them if they admit bad performance. However, if the board of directors is highly independent from management and executives, the agency problem partially vanishes. They will act close and strict control on management and executives, they will report the actual situation of the company as it is and they will take actions against management when necessary because their focus is solely in benefit of the company on the long-term and not being concerned with the managers and executives. Therefore, board independence can have a positive influence on firm performance. In this study board independence is measured as a percentage of the number of non-executive directors on the board compared to the total number of directors on the board (Liu et al., 2015).

3.8.3 Control variables

In this study three control variables (i.e. firm size, firm age and industry dummy) are included in the regression analyses. Although the main focus of this study is to estimate the effects of the internal corporate governance mechanisms on firm performance, other variables can also influence firm performance. That is why we include control variables, to control for their effects on firm performance. The control variables used in this study will be discussed below.

3.8.3.1 Firm size

The first control variable used in this study is firm size. Firm size is often used as a control variable in studies explaining effects on firm performance (Core et al., 2006; Core et al., 1999; Ghabri, 2022; Jesuka & Peixoto, 2022). This is due to the fact that firm size can have a significant impact on firm performance. Babalola (2013), who studied the effects of firm size on firm profitability, found that firm size significantly and positively influences firm performance. Meanwhile Vu et al. (2019) also found a positive relationship between firm size and firm performance. This is due to the fact that bigger firms, tend to have more market share and more capital which creates competitive advantage. Following prior studies firm size is measured as the amount of total assets of a firm (Abeyrathna & Priyadarshana, 2019; Babalola, 2013; Buallay et al., 2017; Malik & Makhdoom, 2016).

3.8.3.2 Firm age

Firm age acts as the second control variable in this study. Firm age is measured as the amount of years a firm has been active. It is necessary to control for firm age, because it has been found to have an impact on firm performance (Sami et al., 2011). Also several other studies that examined firm performance have controlled for firm age (Arora & Sharma, 2016; Buallay et al., 2017; Ciftci et al., 2019; Jackling & Johl, 2009; Kumar, 2004).

3.8.3.3 Industry dummy

The last control variable used in this study is the industry type. To measure the industry type a dummy variable is created. The dummy variable is measured as follows: 1= when the company is active in the manufacturing industry, 0= when the company is active in the service industry. Other studies also often include industry type as a control variable, because the industry specific effects (i.e. size, growth potential, competition level etc.) can impact firm performance (Buallay et al., 2017; Ciftci et al., 2019; Mollah et al., 2012; Vo & Phan, 2013).

4. Results

This chapter of the research paper will discuss the results of this study. The first section will provide an overview of the different variables used along with their descriptive statistics. Thereafter, there is a section that describes the results of the test that was ran in order to determine the correct regression model for the dataset that is used. Finally, two sections describe the results of the panel data regression model tested for each of the two dependent variables (i.e. Tobin's Q and ROA). Each of the sections discussing the dependent variables are divided into four sub-sections where the results of each independent variable (i.e. audit committee, managerial ownership, CEO duality and board independence) is explained.

4.1 Descriptive statistics

Table 1 presents the descriptive statistics for the variables used in the study. Namely the dependent variables measuring firm performance (i.e. Tobin's Q, return on assets), the independent variables measuring four different corporate governance mechanisms (i.e. audit committee, managerial ownership, CEO duality, board independence) and the control variables (i.e. firm size, firm age and industry dummy). The table includes the observations over a three year period that was used in this study as a time series. The sample consisted of 94 firms, that were observed over a three year period, respectively 2019, 2020 and 2021. The period (i.e. three years) multiplied by the number of firms observed (i.e. 94) gives us the number of observations (i.e. 282). Since the variables all have 282 observations, our dataset is strongly balanced. Meaning that our dataset is complete and no data is missing.

The first dependent variable of firm performance is Tobin's Q. This is a market-based measure. The mean Tobin's Q is 2.0146 with a minimum value of 0.1566 and a maximum value of 119.6727. The mean return on assets is 2.0679 and ranges from a minimum of -253.57 to a maximum of 311.16. The return on assets is an accounting-based measure of firm performance and indicates operational performance, while Tobin's Q indicates market performance. Furthermore, there are also four independent variables used in this study. The first independent variable is the audit committee. This variable was measured using dummy variables to indicate whether a company has an internal audit committee or not. This was observed for all companies in the sample and the mean value amounts to 0.8936, which means that most of the companies in our sample had an audit company. The minimum and maximum value are respectively, 0 and 1. This makes sense since they are the only two values this independent variables could amount to. Managerial ownership has a mean value of 0.4321 and refers to the extend in which managers are also shareholders of a company. The minimum value is 0, indicating that a company's managers have no stake in the firm. The maximum value amounts to 0.9748 which indicates that the firm is controlled but also mostly held by insiders. The third mechanism of corporate governance is CEO duality. CEO duality indicates whether the functions of chief executive officer and chairman of the board of directors in a certain company are practiced by the same person. This variable was once again measured by dummies. Meaning that the minimum value is 0 indicating there is no CEO duality present and the maximum value is 1 which indicates that CEO duality is present within the company. The mean value of CEO duality amounts to 0.1595. So the number of firms where CEO duality is not present is higher than the amount of firms in which CEO duality is present. The last independent variable is board independence. This

variable indicates what percentage of the board of directors consists of non-executive directors. The mean value of board independence is 0.2984 and ranges from a minimum value of 0 to a maximum value of 0.8. This indicates that at least one observation in our sample has a board of directors consisting only of executive directors and that the highest number of non-executive directors compared to the total number of directors on the board is 80%. Lastly, we included three control variables in the analyses. The first control variable is firm size. Firm size was measured by the total amount of assets of a firm. The mean value of firm size is 3,083,017 and firm size ranges from a minimum value of 3215.93 to a maximum of 132,000,000. The second control variable used is firm age, which is measured by the amount of years a firm has been active. The mean value amounts to 61.8298, with a minimum of 9 and a maximum of 222. The last control variable is an industry dummy. This variable is included to control if a firm is in the manufacturing or service industry. The value of this variable is 1 if the firm is in the manufacturing industry and 0 if the firm is in the service industry. The mean value amounts to 0.3085. The minimum and maximum values are 0 and 1 respectively.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Firm performance					
Tobin's Q	**282**	**2.014609**	**8.486941**	**0.156649**	**119.6727**
ROA	**282**	**2.067909**	**38.94038**	**-253.57**	**311.16**
Corporate governance					
Aud com	**282**	**0.893617**	**0.3088753**	**0**	**1**
Man own	**282**	**0.4321351**	**0.2554808**	**0**	**0.9748**
Ceo dual	**282**	**0.1595745**	**0.366862**	**0**	**1**
Board ind	**282**	**0.2984348**	**0.2080093**	**0**	**0.8**
Firm size	**282**	**3083017**	**1.38E+07**	**3215.925**	**1.32E+08**
Firm age	**282**	**61.82979**	**50.16272**	**9**	**222**
Ind dum	**282**	**0.3085106**	**0.4626997**	**0**	**1**

Table 1: Descriptive statistics

4.2 Breusch-Pagan Lagrange Multiplier test

As discusses in the methodology, the data set used in this study has to be tested to determine the right analyses. The test performed is the Breusch-Pagan Lagrange Multiplier. The null hypothesis of the test states that all the variance in the residuals across the units is zero. This would indicate that there is no significant difference across the observed firms in our sample, meaning a standard regression analysis is appropriate for our data set. Figures 3 and 4 provide the outcome of the Breusch-Pagan test for Tobin's Q and ROA respectively. The p-value (indicated by Prob > chibar2) amounts to 0.0000, meaning that the null hypothesis is rejected. The variance in the errors across the observed firm is not equal to zero, a standard regression analysis would not be sufficient to capture all the effects of the data set in this study. A panel data regression analysis is more appropriate, because it will capture both cross-sectional and time series effects of the firms within the sample.

Estimated results	Var	sd = sqrt(Var)
tobinsq	**72.02817**	**8.486941**
e	**38.05831**	**6.169141**
u	**36.38763**	**6.032216**

Test: Var(u) = 0	chibar2(01) = 59.26
	Prob > chibar2 = 0.0000

Figure 3: Breusch-Pagan test for market-based performance (i.e. Tobin's Q)

Estimated results	Var	sd = sqrt(Var)
roa	**1516.353**	**38.94038**
e	**391.3713**	**19.78311**
u	**1091.519**	**33.03815**

Test: Var(u) = 0	chibar2(01) = 144.64
	Prob > chibar2 = 0.0000

Figure 4: Breusch-Pagan test for accounting-based performance (i.e. ROA)

4.3 Panel data regression results

In this section of the research paper the results of the panel data regression analyses will be discussed. The results will be discussed in two main sections, one per dependent variable used to analyze the sample data (i.e. Tobin's Q and return on assets). The findings of the panel data regression on the dependent variables will be explained in four sub-sections, each representing an explanatory variable (i.e. audit committee, managerial ownership, CEO duality, board independence) used to analyze the dependent variable.

4.3.1 Tobin's Q

The first dependent variable is Tobin's Q. Tobin's Q is a market-based measure of firm performance. It analyzes whether a company is over- or undervalued by the market. Following a prior study from Herrmann and Nadkarni (2014), the regression models are build hierarchical to show the effect of the control variables on the main effects that we are interested in (i.e. the independent variables). The first model displays the regression results for the control variables in table 2. The second model estimates the effect of the independent variables on their own, displayed in table 3. Finally, table 4 presents the results of the panel data regression analysis including the independent and control variables, executed with the market value of the different companies (i.e. Tobin's Q) in our sample as the dependent variable. Figure 5 presents the hypotheses results. The results of each of the four independent variables on market-based firm performance will be discussed in different sections below.

4.3.1.1 Audit committee

The first internal mechanism of corporate governance is the audit committee. The results of the panel data regression analysis of an audit committee on firm performance measured with Tobin's Q is presented in table 4. The estimator is 0.4438 and the standard error of the estimator is equal to 2.6304. These two values are used to calculate the z-value, which in this case amounts to 0.17. With the z-value, eventually the p-value is estimated. It is however important to note that the p-value given by our statistical analysis assumes a two-tailed alternative hypothesis. In this case the null hypothesis is that beta is equal to zero (H0: $\beta = 0$) and the alternative hypothesis is that beta is not equal to zero (Ha: $\beta \neq 0$). The beta (β) is the average amount by which the dependent variable increases when the independent variable increases one standard deviation and other independent variables are held constant. Hypothesis 1, used to explain this corporate governance mechanism, however states that the audit committee has a positive impact on firm performance. This means that our alternative hypothesis is one-tailed, beta has to be greater than zero (Ha: $\beta > 0$). Therefore we have to divide the p-value by 2 to get the correct p-value. In our results we see that an audit committee is positively and insignificantly correlated with market-based firm performance (i.e. Tobin's Q). The p-value is 0.866. Divided by 2 gives us a p-value of 0.433 and according to the 5% rule, the p-value has to be smaller than 0.05 in order to reject the null hypothesis. The p-value found is much higher which means that hypotheses 1 is rejected. According to this study having an audit committee had no significant effect on market-based firm performance.

4.3.1.2 Managerial ownership

Managerial ownership is the second internal mechanism of corporate governance and independent variable that is tested in this study. The results of the panel data regression analysis are also presented in table 4. The coefficient of managerial ownership equals to -0.9675 and the standard deviation is equal to 3.0618. The z-value is also negative and amounts to -0.32. With the z-value the p-value is eventually estimated. The p-value is equal to 0.752. However, to estimate the effects of managerial ownership on firm performance hypothesis 2 was used. This states that managerial ownership has a significant positive influence on firm performance, making the alternative hypothesis one-tailed. To summarize, the null hypothesis states that managerial ownership has no significant effect on market-based firm performance ($\beta = 0$). The alternative hypothesis states that managerial ownership does have a significant positive effect on firm performance ($\beta > 0$). The p-value displayed in table 4 assumes a two-tailed alternative hypothesis (Ha: $\beta \neq 0$). Therefore, the p-value has to be divided by two. The correct p-value amounts to 0.376. This value is greater than the significance level of 5% ($0.376 > 0.05$), we therefor accept the null hypothesis and reject the alternative hypothesis. Managerial ownership has no significant effect on firm performance, measured by market-based ratio Tobin's Q.

4.3.1.3 CEO duality

The third internal mechanism of corporate governance is CEO duality. The results of a panel data regression analysis on the effects of CEO duality on firm performance (measured with a market-based ratio) are presented in in table 4. The coefficient of the estimator is -1.2055 and the standard error of the estimator equals to 2.1642. These values are used to calculate the z-value. The z-value for CEO duality is negative ($z = -0.56$). With this z-value, the p-value is eventually estimated and

used to test whether the independent variable CEO duality has a significant impact on firm performance. It is however important to note that the hypothesis used (H3) assumes a negative association between CEO duality and firm performance. The null hypothesis is that CEO duality has no significant effect on firm performance ($\beta = 0$) and the alternative hypothesis states that CEO duality has a significant negative impact on firm performance ($\beta < 0$). This means that our alternative hypothesis is one-tailed, while the p-value of the test assumes a two-tailed alternative hypothesis (Ha: $\beta \neq 0$). So, it is important to divide the p-value by 2, to get the correct p-value. The correct p-value equals to 0.289, which is higher than 0.05. This indicates that the alternative hypothesis is rejected because the 95% significance level is not met. This study concludes that CEO duality has no significant impact on market-based firm performance.

4.3.1.4 Board independence

The last independent variable is board independence. This is estimated by the level of independent directors on the internal mechanism of corporate governance: the board of directors. The results of the panel data regression analysis on the effects of board independence on firm performance is presented in table 4. Board independence has a negative estimator of -3.7899 and a standard deviation of 3.7874. The z-value amounts to -1.00 and is obtained by using the coefficient of the estimator and its standard deviation. The p-value shown in the table below is estimated by the panel data regression in assumption of a two-tailed alternative hypothesis (Ha: $\beta \neq 0$). This is not the case for this study. The alternative hypothesis states that board independence positively influences firm performance. This means that the beta has to be greater than zero ($\beta > 0$), indicating a one-tailed alternative hypothesis. So, in order to get to the right p-value, the p-value in table 4 has to be divided by two. The p-value then amounts to 0.1585, this is higher than 0.05 the maximum significance level to accept the alternative hypothesis. The alternative hypothesis is therefore rejected and board independence has no significant effect on firm performance using a market-based measurement of firm performance.

tobinsq	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Firm size	**-1.69E-08**	**5.27E-08**	**-0.32**	**0.749**	**-1.20E-07**	**8.64E-08**
Firm age	**-0.0152428**	**0.0146241**	**-1.04**	**0.297**	**-0.0439055**	**0.0134199**
Ind dum	**-0.2998268**	**1.603063**	**-0.19**	**0.852**	**-3.441773**	**2.842119**
_cons	**3.101558**	**1.178994**	**2.63**	**0.009**	**0.790771**	**5.412344**
sigma_u	**5.9202652**					
sigma_e	**6.1691415**					
rho	**0.47942241**	(fraction of variance due to u_i)				

Table 2: random effects regression with control effects on market-based performance (Tobin's Q)

tobinsq	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
Aud com	**0.0556619**	**2.587363**	**0.02**	**0.983**	**-5.015476**	**5.1268**
Man own	**-1.883119**	**2.923214**	**-0.64**	**0.519**	**-7.612512**	**3.846275**
Ceo dual	**-0.9101762**	**2.100456**	**-0.43**	**0.665**	**-5.026994**	**3.206642**
Board ind	**-3.46304**	**3.726244**	**-0.93**	**0.353**	**-10.76634**	**3.840265**
_cons	**3.957363**	**2.726708**	**1.45**	**0.147**	**-1.386887**	**9.301613**
sigma_u	**5.9613458**					
sigma_e	**6.1691415**					
rho	**0.48287499**	(fraction of variance due to u_i)				

Table 3: random effects regression with independent variables on market-based performance (Tobin's Q)

tobinsq	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
Aud com	**0.4437838**	**2.630405**	**0.17**	**0.866**	**-4.711716**	**5.599283**
Man own	**-0.9675005**	**3.061756**	**-0.32**	**0.752**	**-6.968432**	**5.033431**
Ceo dual	**-1.205485**	**2.164193**	**-0.56**	**0.578**	**-5.447225**	**3.036255**
Board ind	**-3.789918**	**3.787361**	**-1**	**0.317**	**-11.21301**	**3.633174**
Firm size	**-1.83E-08**	**5.38E-08**	**-0.34**	**0.734**	**-1.24E-07**	**8.72E-08**
Firm age	**-0.0169876**	**0.0157932**	**-1.08**	**0.282**	**-0.0479418**	**0.0139665**
Ind dum	**-0.3100197**	**1.649824**	**-0.19**	**0.851**	**-3.543615**	**2.923575**
_cons	**4.561899**	**2.804958**	**1.63**	**0.104**	**-0.9357168**	**10.05951**
sigma_u	**6.0322164**					
sigma_e	**6.1691415**					
rho	**0.48877929**	(fraction of variance due to u_i)				

Table 4: Results of random effects regression on market-based firm performance (Tobin's Q)

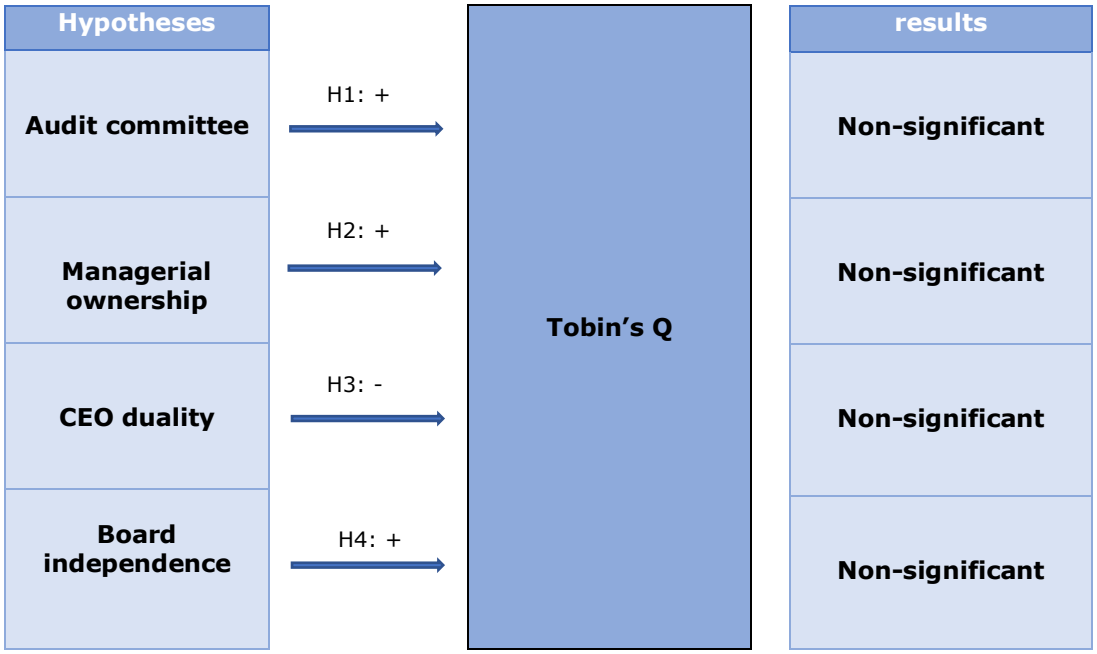

Figure 5: Hypotheses results tested on market-based performance (i.e. Tobin's Q)

4.3.2 Return on assets

The second dependent variable used in this study is the return on assets. The ROA is an accounting-based measurement of firm performance. The ROA measures how efficient a company's management is generating profit from their total assets. In contrary to the market-based measurement Tobin's Q, ROA is described as a measurement of the operational performance of a company. Following a prior study conducted by Herrmann and Nadkarni (2014), the regression models are build hierarchical to show the effect of the control variables on the main effects that we are interested in (i.e. the independent variables). The first model displays the regression results for the control variables in table 5. The second model estimates the effect of the independent variables on their own, displayed in table 6. Finally, table 7 shows the results of the panel data regression model on the effects of the four explanatory variables on operational firm performance and figure 6 presents the hypotheses results. Each of the explanatory variables will be discussed in different sections below.

4.3.2.1 Audit committee

The first internal mechanism of corporate governance is the audit committee. The results of the panel data regression analysis of an audit committee on firm performance measured with ROA is presented in table 7. The estimator is equal to 16.6767 and the standard deviation is 13.1259. These values are used to calculate the z-value ($z = 1.27$). Hypothesis 1 states that an audit committee has a positive impact on firm performance. This means that the beta has to be greater than one in order to positively affect the dependent variable ROA ($\beta > 0$). This indicates a one-tailed hypothesis. However, the p-value estimated by the panel data regression relates to a two-tailed alternative hypothesis (Ha: $\beta \neq 0$). The p-value is therefore divided by two. The null hypothesis used states that audit committee has no significant impact on firm performance ($\beta = 0$). The p-value divided by two is 0.102. The significance level of 95% is not reached. In order for it to be significant the p-value must be smaller than 0.05 ($0.102 > 0.05$). Hypothesis 1 is therefore rejected. The panel data regression explains that the presence of an audit committee has no significant impact on operational firm performance, measured with ROA.

4.3.2.2 Managerial ownership

Managerial ownership is the second internal mechanism of corporate governance and independent variable that is tested for its effect on firm performance, measured with an accounting-based ratio (ROA). The results of the panel data regression analysis are also presented in table 7. The coefficient of the estimator is equal to 24.4136 and the standard deviation is equal to 15.2783. The z-value of the test is calculated with the values of the estimator and its standard deviation ($z = 1.60$). The p-value presented in table 7 ($p = 0.110$) assumes a two-tailed alternative hypothesis (Ha: $\beta \neq 0$). However, the alternative hypothesis used in this study states that managerial ownership has a positive influence on firm performance. This means that the beta has to be greater than zero (Ha: $\beta > 0$) and is therefore a one-tailed alternative hypothesis. The p-value is divided by two in order to get the correct value ($p = 0.055$). The p-value is greater than 0.05 ($0.055 > 0.05$). Hypothesis 2 is therefore rejected, managerial ownership does not have a significant positive impact on firm performance measured with return on assets.

4.3.2.3 CEO duality

The third internal mechanism of corporate governance is CEO duality. The results of panel data regression analysis on the effects of explanatory variable CEO duality on the dependent variable firm performance, measured by ROA is presented in table 7. The coefficient of the estimator equals to 3.8813 and the standard error is equal to 10.7995. These variables are used to calculate the z-value, which in this case amount to 0.36. The z-value is used to calculate the p-value. However, the p-value is calculated under the assumption of a two-tailed alternative hypothesis (Ha: $\beta \neq 0$). In this study the alternative hypothesis claims that CEO duality has a negative impact on firm performance which implies a one-tailed alternative hypothesis ($\beta < 0$). In order to estimate the significance level, we need to divide the p-value by two. In that way we go from a two-tailed alternative hypothesis to a single-tailed alternative hypothesis. The correct p-value is 0.3595. Since, the p-value of the test is greater than 0.05 (0.3595 > 0.05), the alternative hypothesis is rejected. CEO duality does not have a negative impact on firm performance, measured with the accounting-based ratio ROA according to this study.

4.3.2.4 Board independence

The final mechanism of corporate governance is the board of directors. Specifically, we the measure the effects of the independence level of the board of directors on firm performance. Firm performance is the dependent variable, measures by an accounting-based ratio ROA. The results are presented in table 7. The coefficient of the estimator is -15.9634 and the standard deviation amounts to 18.8992. These values give us the z-value which is equal to -0.84. This ultimately gives us the p-value. It is important to note that the p-value in table 7 is estimated by the statistical model under the assumption of a two-tailed alternative hypothesis (Ha: $\beta \neq 0$). In this study, we estimate the p-value under the assumption that board independence positively influences firm performance. This implies that our beta has to be greater than zero, so we use a one-tailed alternative hypothesis (Ha: $\beta > 0$). The p-value is therefore divided by two (p = 0.199). The results of the panel data regression is that board independence is positively but insignificantly related with firm performance measured by ROA. The alternative hypothesis, that board independence does influence firm performance, is rejected because the p-value is greater than the threshold (0.199 > 0.05).

ROA	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
Firm size	**1.92E-07**	**2.68E-07**	**0.72**	**0.474**	**-3.34E-07**	**7.18E-07**
Firm age	**0.1463895**	**0.0745485**	**1.96**	**0.05**	**0.0002772**	**0.2925019**
Ind dum	**-10.17384**	**8.171863**	**-1.24**	**0.213**	**-26.19039**	**5.84272**
_cons	**-4.437428**	**6.010107**	**-0.74**	**0.46**	**-16.21702**	**7.342165**
sigma_u	**33.316744**					
sigma_e	**19.783108**					
rho	**0.73932502**	(fraction of variance due to u_i)				

Table 5: random effects regression with control effects on operational performance (ROA)

ROA	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]

Aud com	**17.58762**	**13.00171**	**1.35**	**0.176**	**-7.89526**	**43.0705**
Man own	**29.42087**	**14.68938**	**2**	**0.045**	**0.6302064**	**58.21154**
Ceo dual	**0.3062706**	**10.55496**	**0.03**	**0.977**	**-20.38107**	**20.99361**
Board ind	**-14.50281**	**18.72468**	**-0.77**	**0.439**	**-51.2025**	**22.19689**
_cons	**-22.08321**	**13.70193**	**-1.61**	**0.107**	**-48.9385**	**4.772078**
sigma_u	**32.973653**					
sigma_e	**19.783108**					
rho	**0.73531545**	(fraction of variance due to u_i)				

Table 6: random effects regression with independent variables on operational performance (ROA)

ROA	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Aud com	**16.67667**	**13.12591**	**1.27**	**0.204**	**-9.049642**	**42.40298**
Man own	**24.41361**	**15.27838**	**1.6**	**0.11**	**-5.53147**	**54.35869**
Ceo dual	**3.881264**	**10.79948**	**0.36**	**0.719**	**-17.28532**	**25.04785**
Board ind	**-15.96343**	**18.89921**	**-0.84**	**0.398**	**-53.00519**	**21.07833**
Firm size	**1.76E-07**	**2.69E-07**	**0.66**	**0.512**	**-3.50E-07**	**7.02E-07**
Firm age	**0.096096**	**0.0788093**	**1.22**	**0.223**	**-0.0583674**	**0.2505594**
Ind dum	**-10.63653**	**8.232739**	**-1.29**	**0.196**	**-26.7724**	**5.499343**
_cons	**-22.44286**	**13.99694**	**-1.6**	**0.109**	**-49.87636**	**4.990636**
sigma_u	**33.038146**					
sigma_e	**19.783108**					
rho	**0.73607535**	(fraction of variance due to u_i)				

Table 7: Results of random effects regression on operational performance (ROA)

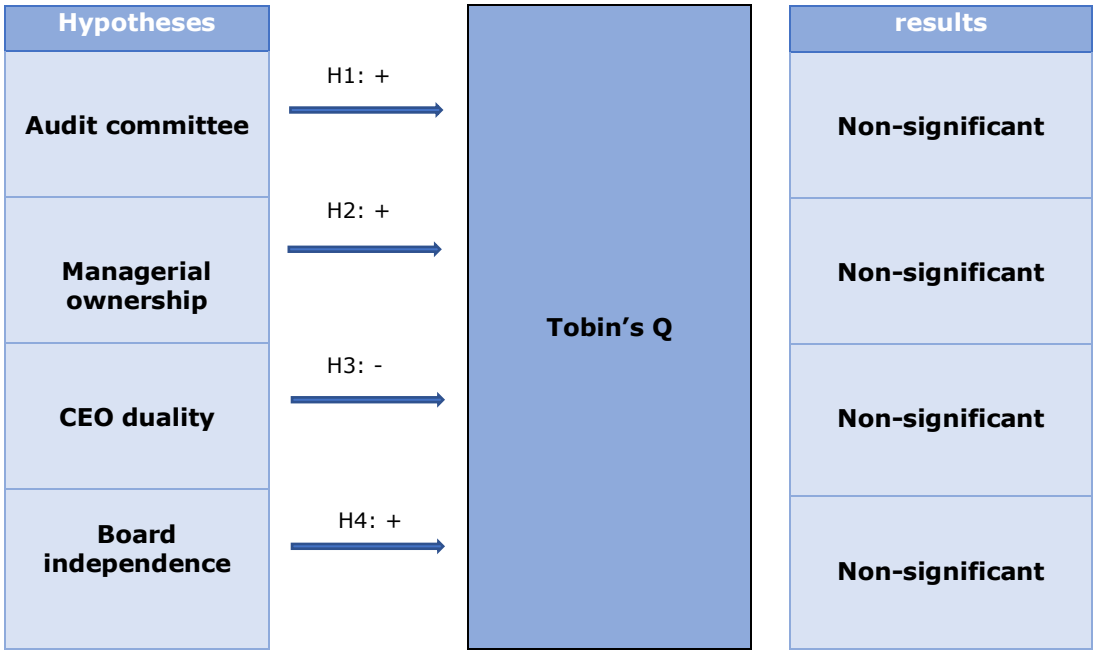

Figure 6: Hypotheses results tested on accounting-based performance (i.e. ROA)

5. Discussion

Our research question was : "*What is the impact of internal corporate governance mechanisms on the financial performance of Belgian listed firms?"*. In this study we examined the effects of four internal mechanisms of corporate governance (i.e. audit committee, managerial ownership, CEO duality and board independence) on firm performance measured with ROA and Tobin's Q. In the following sections we will analyze and discuss the results of each corporate governance mechanism, as well as our contributions to the literature.

5.1 Audit committee

The results of this study for the effects of an audit committee on firm performance for a sample of Belgian listed companies were analyzed in the previous section. The results show that having an audit committee has no significant impact on firm performance for both market-based and operational performance measured with Tobin's Q and ROA respectively. So, hypothesis 1 (H1.) is rejected by the results of this study. Hypothesis 1 of this research assumed that having an internal audit committee does positively affect firm performance. However, finding that having an audit committee does not affect firm performance is not entirely surprising. Zhou et al. (2018) investigated the effects of the board of directors and its different characteristics and audit committees on firm performance using a sample of firms over a 4 year time period. The study was not able to find an association between having an audit committee and firm performance. Furthermore, a study conducted by Al-ahdal and Hashim (2022), who studied the influence of an audit committee characteristics on the performance of non-financial publicly traded companies through a random effects panel data regression, found no significant evidence that the audit committee improves financial performance. Another study reviewed the literature of existing research on the topic of an audit committee and firm performance. It found that an audit committee can have significant benefits for a firm. Such as better and more transparent financial reporting, enhanced monitoring and control. These are benefits that also surfaced in the literature research of this study. The conclusion was that the audit committee can have benefits, but that the overall impact on firm performance of an audit committee will remain limited for most cases (DeZoort & Salterio, 2001).

So, the audit committee has an insignificant impact on firm performance, but why? This may be due to a number of factors. The company may expect the audit committee to focus on ensuring that management comply with the rules, regulations and internal policies. If the audit committee's main focus is to ensure this compliance than they might be so occupied that their focus cannot extend to the strategic decision-making, operational aspects and day-to-day activities of the company (Soh & Martinov-Bennie, 2011). Resulting in their responsibilities being mainly retroactive than proactive, leading to a small or no impact on firm performance. Furthermore, it is important for an audit committee to be independent (Kallamu & Saat, 2015). If the audit committee is not independent from management then their ability to perform unbiased and objective control on management, risk management and review the company's operations may not be effective and efficient. Their ability to assess the organization's and management's activities and performance may fade and their recommendations can become biased (Panda & Leepsa, 2017). When the audit committee is dependent from management, ultimately they will always weigh the decisions with regard of managers and executives, instead of focusing solely on the benefit of the company in the long-run

and the stake-and shareholders. Resulting that the lack of independence can be a factor of limited impact on firm performance. Moreover, an audit committee must also have enough information and resources in order for the committee to function well. For example limited number of employees or budget constraints both affect the quantity and quality of the audit committee's performance. Also the lack of accurate information and data can affect an audit committee's performance. If the audit committee has inaccurate information and data, logically their recommendations and insights will be inaccurate as well.

5.2 Managerial ownership

The impact of managerial ownership on firm performance was tested on a sample of Belgian listed companies in 2 panel data regression models. One model tested the effects of managerial ownership on market-based firm performance measured by Tobin's Q and the second model tested the effects of managerial ownership on operational performance, through the evaluation in ROA. The results for Tobin's Q and ROA both conclude that managerial ownership does not have a significant impact on firm performance, the findings will be discusses below.

The model tested the effects of managerial ownership on firm performance, with Tobin's Q and ROA as the dependent variables. The results show that the independent variable (managerial ownership) has no significant effect on the dependent variables (i.e. Tobin's Q and ROA). Concluding that managerial ownership has no positive effect on market-based, as well as accounting-based firm performance. This leads the study to reject hypothesis 2 (H2.). This agrees with a study conducted by Li et al. (2007), which researched the relation between managerial ownership and firm performance. The study found that high levels of managerial ownership result in lower firm performance, indicating that excessive managerial ownership can lead to a board that is unable to monitor. When this happens, managers will not be held accountable which will reduce management discipline. They might start acting in the best interests of themselves instead of that of the company. This aligns with the literature review (Lasfer, 2006). Furthermore, another study found a nonmonotonic relationship between managerial ownership and firm performance. The study found that firm performance first increases as managerial ownership increases, but then declines if managerial ownership keeps increasing (Morck et al., 1988). The result indicates that there might be an optimal level of managerial ownership where, as discussed in the literature, the interests of managers and stake- and shareholders might be aligned when managerial ownership increases. However, when managerial ownership becomes too high, the agency problem might reoccur and the interests might not be aligned anymore.

5.3 CEO duality

The effects of CEO duality on firm performance was tested in this study through a random effects panel data regression analysis. The random effects regression, was split into two models each testing a different dependent variable for firm performance. One model tested for market-based firm performance (i.e. Tobin's Q) and the other model tested for operational firm performance (i.e. ROA). The results of both models concluded that CEO duality does not have a significant negative impact on firm performance. This means the study rejects hypothesis 3 (H3.), which stated that CEO duality is negatively associated with firm performance. This contradicts research conducted by Duru et al.

(2016) and Tang (2017), who found that CEO duality has a significant negative impact on firm performance. When CEO duality occurs within a company, it means that the executive function of chief executive officer and the function of chairman of the board are held by the same person. This results in an increase in power of the CEO and a decrease in accountability. The board of directors typically exercises control on high-level executives within the firm, but if the chairman of the board is also the CEO this level of control diminishes. The power of decision-making by the CEO also increases, because the board often decides on long-term decisions, while the CEO is in charge of the operational day-to-day decisions. If one person holds the power of deciding both, a wrong decision might occur sooner. This is consistent with another study, that studied the relationship between the chairman of the board of directors and firm performance. The study found that firm performance is lower when the chairman of the board is also the CEO than when another chairman is assigned (Iyengar & Zampelli, 2009).

Meanwhile, Boyd (1995) found a significant, positive effect between CEO duality and firm performance. The study argues that CEO duality improves unity within a company by aligning visions and therefore making decision-making more efficient. Furthermore, the findings of this study are consistent with the results of a study conducted by Hitt et al. (2001) who found no significant difference in firm performance between companies with CEO duality and companies where the CEO and the chairman are two different persons. Moreover, another study who examined the effects of CEO duality, board independence and multi-large stakeholders in family firms found a non-significant impact of CEO duality on firm performance (Goh et al., 2014). This may be due to the leadership of the CEO. As said before, CEO duality increased the decision-making power of one individual. However, this is not necessarily a negative situation. If the CEO of a company is very competent and has great leadership, communication and decision-making skills to successfully execute the positions of both CEO and chairman there might be no difference in firm performance between the separation or combination of control. Another reason might be the competency of the board of directors. While it is true that the chairman is typically the leader of the board of directors, it does not mean that the chairman holds al the power. If the board consists of many competent directors, they might still hold the CEO accountable (even if he is chairman) or will still jointly make the right decisions if the chairman does not. So, the different characteristics of the board of directors (i.e. independency, expertise, diversity, size and composition) might make it indifferent whether the CEO is also chairman or not.

5.4 Board independence

The last corporate governance mechanism was the board of directors. This study focused in particular on the level of independence in the board of directors. The effects of the characteristic board independence on firm performance were tested for a sample of Belgian listed firms. The performance of the firms was measured with two different dependent variables. One measuring market-based firm performance and the other measuring operational firm performance (i.e. Tobin's Q and ROA respectively). The findings of the two models both concluded that board independence does not have a significant impact on firm performance. Hypothesis 4 (H4.), which stated that board independence does significantly and positively influence firm performance, is rejected by the results of the panel data regression analysis. This result contradicts Li et al. (2015) and Gaur et al. (2015). These studies

examined the effects of board independence and ownership concentration on firm performance. The studies both found a significant and positive effects of board independence on firm performance. The reason of the positive effect on firm performance can be partially linked to the reasoning behind the negative effect of CEO duality on firm performance. As said before, the board of directors is in charge of monitoring, controlling, compensating and holding high-level executives accountable for their actions. The CEO is one of them, but also other management members will be controlled by the board of directors. The controlling and decision-making by a strongly dependent board of directors can be biased and untrustworthy. According to Jensen (1993) and Yan Lam and Kam Lee (2008) the decisions of an independent board will be unbiased and more efficient because of their legal obligations and lacking of close ties to management. Concluding that an independent board can contribute to better firm performance.

The findings of this study are however consistent with the results of a study conducted by Rashid (2018). The results show no significant impact of board independence on firm performance. Another study conducted by Mohapatra (2016) showed mixed results. The study examined the effects of board independence and managerial ownership on firm performance. The study shows that board independence has a significant positive effect on market-based performance, but found no significant impact of board independence on operation performance. Thus, this study contradicts the part of market-based performance but agrees with the effect on operational firm performance. As explained above, an independent board of directors can have a positive impact on firm performance by making better, unbiased and more efficient decisions than a highly dependent board. However, the impact on firm performance can also be limited if the board of directors does not have accurate or important information about the actions of the firm and managers. The ability to make decisions without the influence of executives does not do much good if the board does not have access to all the available information. In addition, the expertise and competence of the board of directors plays an important role. The decisions can be unbiased, but if the board lacks the ability to make right decisions their impact will also be minimal. Moreover, the impact of independent directors can also be limited if their influence does not weigh through. This can occur due to the limited number of independent directors on the board. Therefore, it can be important for the board of directors to consist of more independent than dependent directors. In conclusion, there are more characteristics to the board of directors than independence alone which might be the reason that this study found no significant impact of board independence on firm performance.

6. Conclusion

This chapter of the study describes the conclusions that were made by analyzing the results described in the previous section of the research paper. Furthermore, there is also a section dedicated to the limitations of this study and the recommendations for future research.

6.1 Conclusions

The research question of this study was the following: *"What is the impact of internal corporate governance mechanisms on the financial performance of Belgian listed companies?".* The effects of corporate governance mechanisms on firm performance has been a topic for academic research for many years. This study followed up on this academic research by examining the effects of four internal mechanisms of corporate governance (i.e. audit committee, managerial ownership, CEO duality and board independence) on firm performance. The dependent variable firm performance was measured by two ratio's (i.e. Tobin's Q and ROA). The effects on firm performance were measured for a time period of three years, for the years 2019, 2020 and 2021. In total 282 firm-year observations were analyzed by means of a panel data regression analysis. As mentioned before, more research on this topic is needed as existing findings on the relationship between corporate governance mechanisms and firm performance remains inconclusive.

The first internal mechanism of corporate governance is the audit committee. The hypothesis concerning this independent variable was H1., which stated that a significant positive impact of having an internal audit committee on firm performance. The panel data regression analyses were run for both the market-based performance (i.e. Tobin's Q) and the operational performance (i.e. ROA). For both analyses no significant impact of an audit committee on firm performance was found. So, in both cases hypothesis 1 is rejected. Thus we conclude, that an audit committee does not significantly impact the market-based or operational performance of the Belgian listed enterprises that were analyzed in this study.

The second corporate governance mechanism analyzed is managerial ownership. Hypothesis 2 (H2.) formed in chapter 2 of this paper stated that managerial ownership has a significant and positive influence on firm performance. The panel data analysis executed for market-based and accounting-based performance (i.e. Tobin's Q and ROA) found no significant effect of managerial ownership on firm performance. Thus, we rejected hypothesis 2. This means that managerial ownership does not have a significant impact on market-based or accounting-based firm performance of the Belgian listed companies examined in this research paper.

The third corporate governance mechanism examined is CEO duality. CEO duality was tested under the assumption of hypothesis 3 (H3.), which stated that the presence of CEO duality in a company is significantly and negatively associated with firm performance. The hypothesis was tested in two panel data regression models, one testing for market-based firm performance and the other testing for operational firm performance. The results show that CEO duality has no significant impact on both market-based and operational firm performance. Hypothesis 3 is therefore rejected. Meaning, for the sample of Belgian listed firms used in this research CEO duality is not significantly and negatively associated with firm performance.

The last mechanism of corporate governance used in this research paper is the board of directors. Specifically, the independence level of the board of directors is used to examine the impact on firm performance. Hypothesis 4 (H4.) stated that board independence (meaning a higher level of independent directors than dependent directors) significantly and positively influences firm performance. Board independence was tested for the effects on both market-based and operational firm performance in two panel data regression models. The results of the analyses show that board independence does not significantly impact firm performance, for market-based performance as well as operational performance. For that reason, the study rejects hypothesis 4. In conclusion, the level of independence on the board of directors does not have a significant and positive impact on a sample of Belgian listed enterprises.

6.2 Research limitations and recommendations

This chapter discusses the limitations and recommendations of this study. The first limitation of this study was the available information. The financial information of some companies from the sample was missing in the Belfirst database. The missing data was then acquired using the annual reports of certain companies. Although the companies are listed, the financial information concerning previous years was not always easily found. Secondly, the sample size is also a limitation. The sample of this study was big enough according to previous studies on sample size and considering the study observed Belgian listed enterprises. However, the sample size is less when compared with other studies from outside Belgium. Larger sample sizes observed over a long period of time will provide even more meaningful results.

Furthermore, some more recommendations for future research are made based on the results and process of this study. In this study, we looked at the impact of the presence of an internal audit committee on firm performance. However, there are some studies who found that the impact of an audit committee depends on the characteristics of the committee. According to Aldamen et al. (2012) the independence of an audit committee is important for the committee to be effective and efficient. By being independent from management the audit committee is able to monitor management and their actions objectively and provide efficient and unbiased internal control. Moreover, the audit committee should also consist of members with enough financial knowledge and expertise (Sultana et al., 2015). We recommend that future research include these characteristics when examining the impact of an audit committee on firm performance. The second recommendation is to expand the cross-sectional and time-series factor of the panel data regression analysis. This can be done by increasing the sample size and increasing the time frame in which the observations are made. Increasing the sample size and time-span will result in more reliable and valid results and will also increase the significance. The third recommendation is to also include other corporate governance variables. This study examined four different internal mechanisms of corporate governance. Future research can aim to examine the effects of different internal mechanisms of corporate governance to expand the literature on the effects of corporate governance on firm performance in Belgium. Lastly, we also mentioned the role of external corporate governance mechanisms (i.e. regulators, governments, trade unions and financial institutions). Future scholars can also examine the effect of external corporate governance mechanisms (separate or in combination with internal corporate governance mechanisms) on financial performance.

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