# Essays on Corporate Governance and Firm Performance

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A thesis submitted in fulfilment of the requirements for the degree of

Doctor of Philosophy in Finance

The University of Auckland, 2020
New Zealand

## Abstract

Most corporate governance research focusses on prescriptive measures of governance quality (e.g., board composition, attributes) and their association with measures of firm performance but neglects the dynamic nature of governance choices that impinge on firm value. In Chapter 1, I introduce a top-down approach for evaluating board effectiveness in a dynamic context focusing on the empirical outcomes of the decisions they make. A Principal Component Analysis is employed to construct an index of governance quality capturing six key aspects of board responsibilities. In Chapter 2, I turn to examine whether firms' corporate governance quality can positively influence their stock returns and operating performance using the newly developed index that accounts for the dynamic nature of internal governance choices. By constructing decile portfolios of firms based on this measure of governance quality, I show that portfolios of firms with better governance quality outperform firms within the lower governance quality portfolios. Specifically, zero-investment strategies that buy HQ portfolios (highest governance quality) and short LQ portfolios (weakest governance quality) generate 3.9% and 3.2% returns for equally- and value-weighted portfolios, respectively. Finally, in Chapter 3, I follow a similar approach to that developed in the first two chapters to construct a dynamic governance quality index for a sample of public companies from 16 European countries. Comparing the returns of the portfolios based on this index reveals that European companies with higher governance quality (HQ portfolio) generally outperform their peers which possess a lower quality of governance (LQ portfolio). The findings also show that firm-level governance can be affected by country-level elements such as legal and institutional structures.

## Acknowledgements

First and foremost, I would like to express my sincere gratitude to my supervisor, Professor Dimitris Margaritis for excellent guidance. I would have not been able to complete this research without his persistent support. I am also thankful to my co-supervisor Dr Michelle Li, Professor Henk Berkman and other faculty members of the Department of Accounting and Finance at the University of Auckland for providing valuable comments. I gratefully acknowledge the funding I received from the University of Auckland doctoral scholarship. Finally, I would like to say a heartfelt thank you to my beloved husband, Mohammad, who has been by my side every minute of this experience.

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# Part I

# Introduction

Within the governance structure of a public corporation, management decision is separated from decision control, all with the intention of maximising shareholders value (Acharya, Myers, & Rajan, 2011; Martin J. Conyon, 2014). The board of directors as the governing body of the organisations plays an active role in overseeing management and control of the corporation (Adams, Hermalin, & Weisbach, 2010, p. 59). Recent evidence also suggests that the role of the boards has evolved from supervising and monitoring management into playing a more active role in the operation of the business. Based on commonly accepted codes of practice, corporate governance is considered to be effective if possessing the following characteristics: a higher proportion of independent directors, separation of the CEO and board chair roles, frequent meetings, more diversified executives in terms of gender and ethnicity, and a higher level of stock ownership in the company. In theory, if these mechanisms are implemented effectively, they should align the interest of corporate managers with those of the shareholders, increasing firm value and leading to better financial performance.

Empirical evidence, however, has failed to reach consensus on the effectiveness of governance systems. Although some suggest that corporate governance attributes have been successful in delivering what they promise in terms of higher firm value and performance (e.g. Bebchuk, Cohen, & Ferrell, 2009; Gompers, Ishii, & Metrick, 2003), others have not reached such conclusions (e.g. Johnson, Moorman, & Sorescu, 2009). Most research on governance, for instance, begins with the assumption that board effectiveness is a function of its independence from management (Hermalin & Weisbach, 2003). Board independence is deemed to be crucial at promoting more effective governance by limiting the likely social and business connections that might exist between the CEO and the board. In reality, however, it is almost impossible to eliminate all social relations that might exist between the CEO and board of directors, and as Tung (2011) argues "existing independent directors are simply not independent enough." On the other hand, there are those who adhere to the concept of "friendly directors" where social bonds and connections between the executives and directors could even be beneficial, particularly when it comes to the advisory role of the board (Hwang & Kim, 2009). Consequently, much uncertainty still exists about the channels through which different boards characteristics might impact their efficacy.

Prior literature links such contradicting findings to statistical difficulties in measuring governance and addressing endogeneity issues (e.g. Adams et al., 2010; Hermalin & Weisbach, 2003; Schwartz-Ziv & Weisbach, 2013; Wessels, Wansbeek, & Dam, 2017; Wintoki, Linck,

& Netter, 2012). First, firms' governance arrangements, especially the ones associated with the board of directors are described as a "black box" in which board dynamics and their decision-making processes are unobservable to the public (Schwartz-Ziv & Weisbach, 2013; Wessels et al., 2017). Hermalin and Weisbach (2003) consider boards as an institution that has arisen endogenously in response to agency problems inherent in any organisation and highlight the need to employ innovative methods for testing the implications of particular models, rather than focusing on whether independent directors, for instance, are "good" or "bad." Likewise, Adams et al. (2010) review several aspects of board performance and conclude that there is no reason to consider the board's structure to be exogenous. Wintoki et al. (2012) emphasise unobserved heterogeneity, simultaneity and dynamic endogeneity as three potential sources of endogeneity that needs to be addressed when studying corporate governance and its relation to firm performance.

The first essay contributes to the corporate governance literature by introducing a top-down approach for evaluating the board's effectiveness in a dynamic context focusing on the empirical outcomes of the decisions they make. Hence, the focus is not on the board characteristics that have been historically used as measures of good corporate governance, although I examine their association with the newly constructed index. Doing so, I identify the most important firm outcomes that are being directly affected by the board's decision and introduce proxies in each of these categories to demonstrate the quality of such decisions, particularly from a governance viewpoint. Using Principal Component Analysis (PCA), I aggregate these measures into an index representing board effectiveness. I call this measure a "Governance Index" acknowledging the fact that evaluates in a broad sense the efficacy of the corporation's governance in achieving the firm's desired outcomes. After controlling for endogeneity, the results of regressions of the governance measure on different board characteristics do not show any significant relationship between board characteristics and their effectiveness, suggesting that prescriptive characteristics appear to have little power in explaining governance outcomes in a dynamic context. These results suggest that caution needs to be exercised when too much reliance is given to board characteristics in drawing inferences about governance quality.

From a theoretical perspective, corporate governance practices are designed to mitigate agency conflicts and increase shareholder value. Good governance has been argued to provide firms with benefits such as a higher level of monitoring, lower cost of capital due to lower

perceived risk and reduced cash flow tunnelling, all of which can improve firm performance. Yet a number of empirical studies fail to find such association between governance and firm performance (e.g. Bebchuk, Cohen, & Wang, 2010; Johnson et al., 2009). Accordingly, my second essay attempts to examine whether the governance quality of firms, as measured by the constructed governance index, can explain differences in firms' stock returns and operating performance. To that end, I form equally- and value-weighted portfolios of firms based on the constructed index to evaluate whether portfolios of firms that are categorised as having strong governance quality can actually outperform their weakly-governed peers. I find that portfolios with higher governance quality generally offer higher returns (both raw and risk-adjusted). On average, the equally and value-weighted portfolios with the highest governance quality produce 3.9% and 3.2% higher abnormal returns, respectively, compared to firms in the lowest governance quality portfolios. These results remain consistent for investments made within different holding periods. Further analysis shows that governance quality can also explain differences in the value and operating performance of firms.

The sample employed for the analysis of the first two essays includes the largest publicly traded US companies. In the third essay, I shift my focus to an international context, assessing the corporate governance quality of firms in European countries. Recent developments in capital markets have renewed interest in the study of European governance systems embedding the contrasting features of the Anglo-American governance model (Ireland, UK) vis-a-vis those of Continental Europe. Most empirical research within this area seems to confirm that stylised governance models do not generate the expected outcomes in all countries. This is probably due to the fact that European companies face different governance challenges than those of the US firms due to inherent differences in their countries' legal origin, shareholders protection, law enforcement and ownership structures. For example, the concentrated structure of Continental European firms may mitigate the classical principal-agent problem at the expense of amplifying principal-principal agency conflicts between majority and minority shareholders. Therefore, "one size does not fit all" and European governance regulations need to be tailored in accordance with their innate characteristics (Aguilera, Desender, Bednar, & Lee, 2015).

Most studies investigating European corporate governance systems have opted to follow the common path for evaluating governance quality, which is to identify how well governance arrangements are tied up with corporate governance codes of best practice (e.g. Belot, Ginglinger, Slovin, & Sushka, 2014; Renders & Gaeremynck, 2012). However, such an

approach can provide misleading results. This is because European countries mostly possess a voluntary compliance system where they follow a “comply-or-explain” approach which gives them more flexibility in terms of which governance provision to comply with, based on what is actually beneficial for their companies. In this sense, non-compliance may not necessarily be interpreted as poor governance (Aguilera & Crespi-Cladera, 2016).

The motivation of my third essay is to contribute to the literature by introducing a new governance measure centred on firm outcomes rather than the level of compliance with mandated rules. Accordingly, I follow the same procedure I used in the first two essays to construct a governance quality index for a sample of public companies from 16 European countries. Comparing the returns of portfolios based on this index and controlling for differences in country-level macro factors, I find that effective corporate governance improves European companies’ performance, though firm-level governance effectiveness is influenced by country-level elements such as legal and institutional setups.

The remainder of the thesis is organised as follows. Part II contains three essays on corporate governance and firm performance. Chapter 1 constructs a governance index, paying attention to potential principal-agent problems and the role of the board of directors in mitigating these conflicts. Chapter 2 examines whether the new measure of governance quality is related to stock market returns and other measures of firm performance. Chapter 3 replicates the analysis of the first two essays to study the quality of boards outcomes on firm performance in a European context. Part III concludes.

# Part II

# Essays on Corporate Governance and Firm Performance

# Chapter 1

# The Quality of Boards Decision and Corporate Governance

**Abstract**

The objective of many corporate governance reforms is to provide greater transparency and control over the actions of companies' management assuring shareholders that they get a return for their investment. However, the main challenge is how to assess the effectiveness of these governance mechanisms. Using Principal Component Analysis this study constructs an index representing board effectiveness. Rather than considering the role of governance exclusively in terms of structural arrangements, this study relies on empirical outcomes of the decisions the boards make to gain insights into the value they bring to their companies. After controlling for endogeneity, the results do not show any significant relationship between board characteristics and their performance.

## 1.1 Introduction

The Board of Directors as the governing body of every organisation plays an active role in overseeing management and control of the corporation (Adams et al., 2010, p. 59) and has the authority to make important decisions about the future direction of the business. Shareholders are the owners of the company, and in principle, the board's duty is to ensure that the corporation and its management are acting in the best interests of the stockholders. However, if we accept the notion that individuals are utility maximisers, there is a good reason to believe that the agent (managers) will not always act in the best interests of the principal (shareholders);

a phenomenon that is referred to as “agency problems” (Jensen & Meckling, 1976). Morck (2004) distinguishes between two types of agency problems; Type I agency problem that is what Jensen and Meckling (1976) define as agency problem that occurs when managers act opportunistically based on their self-interest, rather than being faithful agents of the shareholders. Type II agency problem occurs when directors fail to perform their duty in monitoring the management and fall into line behind their CEO, mainly due to the presence of some forms of social ties between them.

From a theoretical perspective, corporate governance provisions are expected to be beneficial in mitigating the agency conflicts by increasing the transparency and providing greater monitoring and control over the actions of the company executives (Hermalin & Weisbach, 2007). Theoretically, if these mechanisms are implemented effectively, they should align the interest of corporate managers with those of the shareholders, increasing the firm’s value and leading to better financial performance. However, the main issue is how to evaluate the effectiveness of these provisions. And when it comes to empirical investigations, there are obstacles in studying the internal dynamics of the board due to the unobservability of their decision-making process (Schwartz-Ziv & Weisbach, 2013). Therefore, current literature on board performance relies on corporate governance best practice recommendations and identify boards as being effective provided they fully comply with these provisions. Much of this evidence, however, has led to equivocal conclusions.

Hermalin and Weisbach (2003) refer to these ambiguous findings as being the result of endogeneity issues and measurement errors. They consider boards as an institution that has arisen endogenously in response to agency problems inherent in any organisation, and highlight the need to employ innovative methods for testing the implications of particular models, rather than focusing on whether independent directors are “good” or “bad.” Likewise, Adams et al. (2010) review several aspects of board performance and conclude that there is no reason to consider the board’s structure to be exogenous.

As Hermalin and Weisbach (2003) suggest, “One way to evaluate the board’s effectiveness is to look at the quality of the decisions they make.” To capture this notion, I follow the work of Baker and Wurgler (2006) introducing a top-down approach for evaluating the board’s performance and construct an index representing the board’s effectiveness by looking at the outcomes of the decisions they make. In other words, I do not explicitly consider different

board characteristics that have been historically used as measures of good corporate governance and instead focus on empirical outcomes (i.e. the results of board actions).

To begin this process, based on the previous literature, I first identify the most important firm outcomes that are being directly affected by board decisions. I, then, introduce proxies in each of these categories to capture the quality of the board's decisions, particularly from a governance viewpoint. Following this, a Principal Component Analysis (PCA) is employed to identify the orthogonal components that account for most of the variability in the data. These principal components are used as indicators of board performance that can be aggregated to an index measuring performance across firms and industries. This is in contrast to existing measures of board performance which are static in nature. The new measure is then used to study whether firms with more effective boards of directors are more likely to be associated with different board characteristics commonly accepted as constituting corporate governance best practice. Although governance has often been hypothesised to influence firm performance and stock returns positively, no certain conclusion is still available. In the next chapter, the constructed governance index will be employed to investigate this relationship.

This study contributes to the existing knowledge by providing a new setting for evaluating the board of director's performance in a dynamic context. To the best of my knowledge, there is no prior study quantifying boards' behaviour based on their decision outcomes. Nonetheless, there have been several attempts to construct different governance indexes to evaluate firm's corporate governance quality. For example, in a well-known study, Gompers et al. (2003) construct a governance index (G-score) as a proxy for the balance of power between shareholders and managers focusing on anti-takeover provisions; firms in the highest decile of their index are referred to as having the "highest management power" or the "weakest shareholder rights" and are shown to significantly underperform firms with the strongest shareholder rights (low values of G).

Existing governance indexes are, however, being criticised for either offering an incomplete view of corporate governance or summing up too many variables rather than focusing on what really matters making it challenging to have a meaningful interpretation (Aguilera et al., 2015). Moreover, these measures are generally constructed by ascertaining whether or not a particular governance standard is met. However, compliance with corporate governance provisions does not necessarily reflect a well-governed firm.

Furthermore, due to the complexity of the boards decision-making process, prior research has considered either a managerial role (Adams & Ferreira, 2007; Harris & Raviv, 2008) or a supervisory role (Hermalin & Weisbach, 1998) when analysing board behaviour. In a recent study, Schwartz-Ziv and Weisbach (2013) refer to boards as "active monitors" and conclude that the supervisory and managerial models are complements and both can partially explain what boards do. However, most of the board-related governance recommendations being used in constructing governance indexes are aimed at improvements in the monitoring ability of the board. The present study extends prior literature by considering a holistic view covering both monitoring and supervisory duties of boards, but without necessarily separating them.

The remainder of the chapter is organised as follows. Section 1.2 overviews the role of the board of directors and details the different proxies that I have considered in the construction of the governance index, paying attention to potential principal-agent problems and the role of the boards in mitigating these conflicts. Section 1.3 describes the methodology, data and variables used in the econometric analysis. Section 1.4 explains how I constructed the governance index and reports the findings. Section 1.5 concludes the chapter.

## 1.2 Appraising Board of Directors Performance

Recent evidence suggests that the role of the boards has evolved from supervising and monitoring management into more active roles in the day-to-day operation of the business such as engaging in project selection (Adams & Ferreira, 2007), acquiring information and choosing the scale of investments (Harris & Raviv, 2008). Based on the previous literature, the main responsibilities of the boards could be summarised into the following activities (Adams et al., 2010; Bear, Rahman, & Post, 2010; Larcker, 2011):

- Ensuring the integrity of published financial statements
- Approving major investment activities, mergers, and acquisitions
- Determining and approving financing methods and firm capital structure
- Monitoring management performance and compensation schemes
- Setting the business model, identifying key performance measures and representing the interest of shareholders regarding firm performance
- Protecting company reputation and integrating social and environmental concerns in business operations decisions

In order to evaluate the quality of firms' corporate governance and the overall performance of their boards, I define proxies representing the effectiveness of the board decision making in each of these activities. These proxies are then compiled into an index representing the overall performance of the board.

### 1.2.1 Information Disclosure, and Financial Reporting Quality

Previous studies have emphasised the role of board of directors in protecting shareholders' interests by monitoring the CEOs' performance and the financial information being generated by the firm. Entrenched managers may have several incentives for disclosure related distortions such as reputational concerns, delay in disclosing bad news and insider trading opportunities (Ajinkya, Bhojraj, & Sengupta, 2003, p. 2).

Numerous studies have attempted to explain the agency conflicts that might encourage management to withhold, delay or bias disclosure using the concept of accruals management and accounting restatements. Chen, Firth, Gao, and Rui (2006) note that earnings management, although not necessarily illegal, is considered as being opportunistic (p. 430). As Xie, Davidson, and DaDalt (2003, p. 296) argue, accrual accounting provides managers with a great deal of control over the timing of recognising revenues and expenses. The managers have the incentives to alter such timing due to several reasons. First, management compensations schemes are often based on their companies' financial performance, motivating them to give the appearance of better performance. Second, in capital markets, managers might engage in earning management activities with the aim of improving investors' expectations of future performance, meeting or beating analyst expectations, or for their own contractual incentives. For example, managers might have incentives to inflate earnings prior to a management buyout or in case they engage in a hostile takeover by using overpriced stock as a cheap acquisition currency.

The increased incidence of accounting fraud has led to a great deal of corporate governance reforms to be devoted to the transparency of financial reporting and information disclosure. The most important ones require publicly traded firms to have a board of directors consisting of a majority of independent directors and also audit committees of solely independent directors of which at least one has financial expertise (Agrawal & Chadha, 2005, p. 372).

To date, several studies have emphasised the importance of different forms of diversity in the proportion, gender, and experience of independent directors. Traditionally, it is believed that firms with more independent executives who are more gender-diversified and financially sophisticated are less likely to engage in earnings management and fraudulent business behaviour (Xie et al., 2003). The background of independent directors is an important factor that should be taken into account when examining the monitoring abilities of the board of directors. Xie et al. (2003) argue that directors with stronger financial backgrounds have a better understanding of the ways that the earnings might be managed and therefore are more capable of detecting earnings manipulation by managers. Similarly, Park and Shin (2004) find that outside directors would be effective in recognising earnings management but only if they possess a finance or accounting background. In the same vein, Cumming, Leung, and Rui (2015) examine the effects of top executive gender diversity on earnings management and show that the presence of women occupying senior positions on the board can moderate the frequency and severity of fraud. Lai (2010) examines the merit of corporate governance regulations in China and concludes that some of these mandated regulations like board independence can be efficient in reducing earnings management only if adopted voluntarily (p. 6).

Although it is expected that independent directors can monitor management more efficiently, empirical research has not reached any consensus regarding the effectiveness of the board structure-related governance practices. Agrawal and Chadha (2005) examine the relationship between certain governance provisions, most notably the presence of executive directors on the board and its audit committee, and the incidence of accounting manipulation exemplified by earnings restatements. While they uncover no systematic relationship between board and audit committee independence and the probability of earnings restatements, they find that the probability of restatement is lower if a board includes a member with financial expertise (p. 374). As an explanation for their findings, the authors argue that the board of directors is often busy with many other responsibilities such as CEO hiring, firing, and compensation as well as monitoring the overall business strategy, rather than solely overseeing the firm's financial reporting. They argue that as the audit committee is not very active and often meets infrequently, it could be difficult for them to detect problems in financial reporting behaviour especially for a large corporation in a short span of time (p. 375).

Habib and Jiang (2015) distinguish between three categories of proxies that have been employed by previous studies to operationalise financial reporting quality: properties of earnings (e.g. earning persistence, accruals, and earnings conservatism), investors responsiveness to earnings (e.g. future earning responsiveness coefficient), and financial reporting manipulation (e.g. accruals management and accounting restatements). They claim that most of the previous studies investigate one of these categories, and only a few studies use a comprehensive framework to analyse financial reporting quality (p. 35). This view is supported by Salleh and Dunmore (2009) who use disclosure quality and earnings quality as the two main types of proxies for financial reporting quality, noting that considering only one of the financial reporting quality measures could be misleading. They argue that disclosure quality and earnings quality are not necessarily complimentary, and thus, high-quality disclosure for a firm does not imply that it also has high-quality earnings (p. 38).

Several other factors such as CEOs duality and its influence on outside directors can impact directors' monitoring effectiveness. Therefore, investigating the relationship between board characteristics and financial reporting quality as a measure of boards' monitoring effectiveness can be quite a challenging task. This study uses a top-down approach arguing that high-quality financial reporting and voluntary information disclosure are signals of well-functioning boards with regards to monitoring management and protecting shareholders' interests.

### 1.2.2 Capital Expenditures, Mergers and Acquisitions

Evidence suggests that not all M&A activities might be initiated with the aim of shareholder wealth maximisation and that self-interested managers might have other motives to get involved in acquiring other firms. Damodaran (2012, pp. 710-711) classifies managerial motivation for initiating mergers and acquisitions in three categories of 'empire building', 'managerial ego' and 'compensation and side-benefits.' Empire building is described as a situation where managers want their firms to be the largest and the most dominant company in the market. Managerial ego, also labelled as managerial overconfidence in some studies, refers to the power struggle between managers when there are multiple bidders for a target, and none of them wants to lose the battle even if winning can only be achieved at the expense of shareholders. Mergers and acquisitions may also entail private gains for managers since for example, managerial compensation is often a function of firm size.

Haller (2013) uses the concept of envious CEOs (i.e. CEOs comparing their compensation with their peers) to argue that corporate governance might affect M&A outcomes negatively. Good corporate governance improves information transparency. CEOs are more likely to be informed about their peers' compensation which increases the envy among them. Thus, they might get involved in deals only to achieve higher compensation (p. 146). Therefore, acquisitions become more likely to be value-destroying rather than value-enhancing for the acquiring firm's shareholders (Chen, Crossland, & Huang, 2014).

A great deal of previous research on corporate governance has focused on the effects of board of directors' characteristics on acquisition behaviour. In an important study in this area, Giroud and Mueller (2011) examined the relationship between corporate governance effectiveness and investment decisions and demonstrated that companies with weak governance, have higher capital expenditures and make more acquisitions compared to companies with good corporate governance. In the same vein, Chen et al. (2014, p. 303) show that companies with more gender diversified board of directors make fewer acquisitions and conditional on doing a deal, make smaller deals. Large acquisitions are, therefore, suggested to be representing executives self-dealing, and decision-making biases resulting from executive's hubris (Hayward & Hambrick, 1997, p. 106). Similarly, Levi, Li, and Zhang (2014) find that there is a negative relationship between the number of female directors seated on the boards and both the likelihood of making acquisitions and the size of acquisitions (p. 185). Other studies on the buy-side of M&A report that firms with more effective boards make better deals and experience lower stock price drops following the acquisition announcement (Byrd & Hickman, 1992).

Much of the available literature on takeovers deals with the issues of firms on the sell-side of takeovers. Hermalin and Weisbach (2003, p. 15) suggest that board of directors might influence the takeover process both directly and indirectly throughout affecting the quality of governance and thus, firm's attractiveness as a target. It has also been suggested that the board of targeted companies might resist a takeover bid due to their pecuniary incentives regardless of its effects on shareholder's wealth. The target directors might eventually lose their seats and their pay, and the gain from the equity they hold is not often enough to compensate for their loss. Moreover, firms with good corporate governance where boards have the ability to monitor CEOs more efficiently are less likely to be taken over by hostile takeovers or activists hedge funds (e.g.Giroud & Mueller, 2011). Their shareholders also receive higher returns if an

acquisition occurs. As documented by Cotter, Shivdasani, and Zenner (1997), firms with more independent directors receive much higher returns, on average, than their peers without a majority of independent directors.

Most of the above studies focus on boards of directors' characteristics which aim at improving the monitoring function of the board (i.e. concepts like independent directors). However, contrary to popular belief, independent boards of directors are not always beneficial, and in some circumstances when the advisory role of the board is more important than their monitoring duties, less independent boards (more friendly boards) can be more beneficial to shareholders (Adams & Ferreira, 2007; Harris & Raviv, 2008). Faleye, Hoitash, and Hoitash (2011) suggest that intense focus on the oversight duties of the board improves their monitoring quality, albeit at the expense of deterioration in their advising function. They consider acquisitions as activities demanding significant board inputs and demonstrate that overall, the negative advising effects of monitoring intensity outweigh its positive monitoring effects. Similarly, Schmidt (2015) constructs two separate indexes to distinguish between acquisitions that require either more monitoring or advisory contribution of the board. He finds that when boards have valuable information about the deal, companies with more friendly boards would have higher returns after the announcement of the acquisition. This is particularly the case for complex firms with higher advisory requirements that reduce the board's effectiveness and result in worse acquisition performance and lower firm value. Therefore, describing boards as being effective solely based on their structure and characteristics has the potential to be misleading. This study uses acquirers' stock returns around the announcements of their major acquisition to evaluate the board's effectiveness with regards to their M&A decisions. In this top-down approach, I refer to firms which have higher acquisition returns as firms with the more efficient board of directors.

### 1.2.3 Capital Structure

Firm financing and capital structure decisions have generally been recognised as one of the most vital functions of the companies' management team. Based on the trade-off theory, firms seek to achieve an optimal capital structure considering the cost and benefits of issuing debt. The advantages of debt financing are mainly related to the tax-deductibility of interest payments; while the costs of debt include the risks imposed through the higher possibility of bankruptcy, and the agency conflicts that might arise between managers, debtholders, and

shareholders. Jensen and Meckling (1976) show that such agency conflicts could be due to an "asset substitution" or 'risk-shifting" problem which assumes that managers can freely substitute more debt for equity, creating chances for managers to manipulate the capital structure by selecting riskier investments (i.e. higher payoffs) after issuing debt at the expense of debtholders. However, the new risky investment increases the likelihood of financial distress, hence the risk of equity also rises, and as Jensen and Meckling (1976) show, higher bankruptcy costs may be ultimately incurred by shareholders.

The pecking order theory suggests that managers have a preference for using retained earnings over debt and debt over equity for financing their investments. The theory reflects information asymmetry and adverse selection problems that might exist between corporate managers and investors. As Myers and Majluf (1984) point out, when there are profitable investment opportunities, internal financing would be the best option followed by debt financing. However, in the event that the firm does not possess enough internal sources to invest in the new opportunity, and if low-risk debt financing is not available, managers might pass the new investment opportunity up (p. 219-220). The reason is that issuing new equity would be considered as a negative signal from the perspective of investors who have less information about the firm's value than managers and might demand a discounted price for buying the newly issued equity. In this situation, issuing more equity would not be much desirable for managers, as it can transfer wealth from current shareholders to the new shareholders (Alves, Couto, & Francisco, 2015, p. 4).

Empirical research following the pioneering study of Jensen and Meckling (1976) considers leverage as a monitoring tool which can mitigate the agency conflicts by constraining managers from wasting free cash flow and forcing them to make better investment decisions (because of the high possibility of bankruptcy). Grossman and Hart (1982) refer to issuing more debt as being "a pre-commitment or bonding behaviour" which signals that the interests of the management are aligned with those of the shareholders in terms of pursuing higher market value (p. 109, 110). Some authors, on the other hand, have proposed a takeover defence role for debt financing. According to Berger, Ofek, and Yermack (1997), self-served managers can use more debt as protection against takeovers when there is a threat to their job security, without taking into account that excess leverage may negatively impact shareholders' wealth.

The existing literature recognises the importance of corporate governance for capital structure analysis and emphasises its critical role in minimising the agency problems and

reducing the cost of capital. Effective corporate governance can lessen the cost of equity by providing direct protection for shareholders and preventing entrenched management from making self-serving investment decisions at the expense of shareholders. Further, by reducing information asymmetry, good governance can lower the monitoring costs of equity holders. High-quality corporate governance can result in more efficient use of resources by the managers which will, in turn, reduce the probability of default and lower the cost of debt financing (Mande, Park, & Son, 2012).

However, consistent with the pecking order theory, Alves et al. (2015) show that equity financing is more sensitive to agency problems in terms of information asymmetry and managerial entrenchment. This is because debt holders can use debt protective mechanisms such as debt contracts to secure their interests. They, therefore, conclude that an improvement in corporate governance quality which will result in lower information asymmetry, will have more impact on equity financing compared to debt financing, and more precisely, "firms with strong governance show a preference for equity when compared to debt." Further, Chang, Chou, and Huang (2014) suggest that compared to equity, "debt is more likely to be used as a tool for gaining personal benefits by the managers" (p. 383).

Looking at the issue from a different perspective, Nadarajah, Ali, Liu, and Huang (2016) argue that corporate governance can impact capital structure in favour of equity by improving stock liquidity. More precisely, they show that firms with more liquid stocks will have lower floatation costs when issuing equity, making it a more appealing financing option compared to debt. Thus, good corporate governance promotes stock liquidity which in turn results in lower levels of leverage (p. 2).

In conclusion, I consider that better governance is more likely to be associated with equity financing because of the lower agency conflicts in the firm. This is not to say that debt financing does not have a role to play in mitigating agency conflicts, however high-quality corporate governance can be expected to remedy agency problems to the point that equity financing becomes more desirable than debt financing.

### 1.2.4 Executive Compensation

The dramatic rises in CEO compensations during the past few decades which were not necessarily accompanied by better firm performances brought about a general suspicion about

the efficiency of these compensation packages. Since then, several scholars have tried to explain the compensation increases by evaluating the determinants of executive compensations. In an attempt to analyse the long-run trends in executive compensations, Frydman and Saks (2010) categorise compensation determinant theories into four groups of incentive provisions, managerial power, firm characteristics, and managerial skills.

In principal-agent theories where compensation packages are typically considered a solution for mitigating the conflicting interest between the managers and shareholders, firms are encouraged to pay their executives in the form of restricted stock units and stock options (Martin J. Conyon, 2014, p. F61). In line with this, several studies argue that the upward trends in executive remunerations can be explained by simultaneous increases in contingent pay as firms should compensate their executives for bearing greater risk (Conyon, Core, & Guay, 2010).

On the contrary, managerial power explanations look at compensation as an agency conflict itself providing entrenched managers with the chance to skim profits from the firm. Therefore, it is the board of directors' responsibility to determine appropriate executive compensation and ensure that the compensation schemes align the interest of managers and shareholders. As CEO pay is under the direct control of the boards and their compensation committees (Martin J. Conyon, 2014), many studies in the field of corporate governance link firms' executive pay to the quality of corporate governance. Well-governed firms are expected to have lower levels of excess executive compensation, more incentive pay and higher pay-performance sensitivity (Renneboog & Zhao, 2011, p. 1136).

However, there is no general agreement on the association between different governance practices and the level and structure of executive pay. For instance, although CEO pay in firms with more independent directors is expected to be lower and positively related to the firm's performance, several studies could not find such an association (Martin J Conyon, 2014; Core, Holthausen, & Larcker, 1999; Frydman & Saks, 2010). As an explanation for these findings, it is argued that independent directors are not really 'independent' and the CEO often has a great influence on outside directors appointments who in some instances may be appointed by the CEOs themselves (Core et al., 1999, p. 373). Some studies even report a positive relationship between the number of independent directors and CEO pay increases. To the extent that independent directors engage in stricter monitoring over the actions of the CEO, more board

monitoring imposes more risk and incentives on the CEO leading to greater effort for which they should be compensated (Martin J Conyon, 2014, p. F64).

Some studies have, also, linked executive pay to firm characteristics and managerial skills. According to Gabaix and Landier (2008), large firms have to pay their executives substantially more compare to smaller firms to cover for the greater managerial talent required to lead large companies. In a similar way, but from a different perspective, Dicks (2012) evaluates the relationship between firm size and executive pay. He considers governance and compensation as being substitutes, allowing well-governed firms to lower executive compensation. Because small firms find governance expensive, they have to solve agency problems by offering higher incentive pay and therefore, higher compensation to their executive. This generates greater competition for executive talents and forces large firms to offer higher compensation to their executives to make sure they will stay in the firm.

Overall, we would expect good governance to define a reasonable executive compensation structure which can align the interest of managers with those of the shareholders. Therefore, in my top-down approach, lower levels of excess executive pay will be considered as a signal of better board performance regarding their decision on CEO pay. The amount of this excess pay can be calculated as part of the executives' total compensation that cannot be explained by other accepted determinants of pay such as firm performance, executive's individual characteristics and firm fixed effects (Berger et al., 1997, p. 1417).

### 1.2.5 Firm's General Financial Outcomes

Shleifer and Vishny (1997) define corporate governance as "the ways in which suppliers of finance to corporations assure themselves of getting a return on their investment." It is clear from this definition that achieving good financial returns is one of the key objectives of good governance. Therefore, historically, research investigating corporate governance effectiveness has focused on different financial and non-financial outcomes such as firms' stock and operating performance, competitiveness, and corporate reputation. Although the findings are mixed, good firm performance is likely to be the result of a well-functioning corporate structure underpinning all the important decisions for running the business. Therefore, this study argues that better financial performance is closely aligned with the existence of well-functioning governance.

### 1.2.6 Non-financial Performance: Corporate Social Responsibility (CSR) and Reputation

The failure of high-profile companies such as Enron and WorldCom in the 2000s along with the growing interest in sustainable development practices put companies' governance under scrutiny, calling for a greater need for ethical behaviour and environmental and social responsibilities of the firms towards a broad range of stakeholders (Mallin & Michelon, 2011, p. 120). Accordingly, the concept of CSR has received considerable attention in corporate governance studies. European Commission (2011) defines CSR as "the responsibility of enterprises for their impacts on society" and more specifically "to have a process in place to integrate social, environmental, ethical human rights and consumer concerns into their business operations and core strategy in close cooperation with their stakeholders." Within this framework, firms make decisions and allocate their resources in a way that not only maximise the financial interest of their shareholders but also satisfy various other stakeholders such as customers, suppliers and employees (Pérez, 2015).

In addition to the agency theory which focuses on the monitoring function of the board of directors, modern governance literature introduces another organisation theory called 'resource dependence theory' which highlights the role of boards in providing legitimacy and critical resources such as human capital (i.e. experience, expertise and reputation) and relational capital (i.e. social connection and networks with firm's external environment) for the firm (Mallin & Michelon, 2011). As discussed by Bear et al. (2010), these board resources enable the corporation to understand and respond to its environment which ultimately results in better management of CSR issues (p. 209).

Here, a question arises concerning why companies' management should care about CSR. The answer lies in the concept of corporate reputation where CSR reporting is considered as a management tool for signalling corporate governance quality and enhancing corporate reputation. Corporate reputation has long been considered as an intangible asset enhancing competitive advantages for the firm. It can be defined as "perceptions of how the firm behaves towards its stakeholders and the degree of informative transparency with which the firm develops relations with them" (Pérez, 2015, p. 15). CSR and reputation are two interrelated concepts. It is clear from the definition of reputation that it involves both a behavioural and an informative component (Pérez, 2015). Firms that are perceived to be socially responsible to

their stakeholders can end up having a more positive reputation for future performance. The informative component of reputation is also consistent with the main purpose of agency theory where information exchange and greater transparency reduce information asymmetry.

Empirical studies have also linked corporate governance to CSR and reputation. Corporate governance provisions, especially the ones concerning board's structure, are expected to improve CSR reporting which in turn positively impacts corporate reputation (Bear et al., 2010). Mallin and Michelon (2011) found that a higher proportion of independent directors is associated with better corporate social performance. The theoretical argument behind these findings is that independent directors often establish external links with stakeholders and are more likely to be knowledgeable about critical external issues surrounding the firm. They are more likely to be concerned about CSR activities to avoid penalties, negative media exposure and subsequent loss of reputation (Mallin & Michelon, 2011, p. 122).

Evidently, being socially and environmentally responsible would impose additional costs on firms which may act as a barrier against compliance with CSR practices. In this regard, Arora & Dharwadkar (2011) distinguish between positive and negative CSR. They argue that positive CSR refers to situations where firms opt for adopting proactive sustainability practices, while negative CSR can be linked to poor decision-making practices that can, for example, lead to environmental degradation. They further suggest that an improvement in firms' governance quality is expected to lessen the negative CSR effects, while policies to improve positive CSR would depend on the firm's cost-benefit analysis. Based on these arguments, in addition to financial measures of performance, this study also includes non-financial components of performance when evaluating the corporate governance quality. In this regard, better CSR activities are considered to be signs of a well-functioning board of the firm.

## 1.3 Data and Methodology

### 1.3.1 Sample Selection and Data

This study uses a sample of firms in the S&P 1500 Super Composite index (*GVKEY*: 031855 and *Ticker*: I0020) during the period of 1992–2015. I use CRSP/Compustat Merged (CCM) provided by Wharton Research Data Services as the main database. This database combines stock market data from the Centre for Research in Security Prices (CRSP) and accounting and fundamental data from Compustat. This main dataset is then merged with the Compustat

Executive Compensation (ExecuComp), Securities Data Company (SDC), Institutional Shareholder Service (ISS) Directors and MSCI KLD databases.

The S&P1500 index which combines all the S&P 500, Mid-Cap 400 and Small-Cap 600 companies covers more than 80 per cent of US market capitalisation. The motivation behind choosing this sample is to ensure that sufficient data is available for most of the governance sub-indexes. The ExecuComp database which is used for calculating CEOs' excess compensation only contains information on S&P1500 companies starting from the year 1992. The MSCI KLD database provides CSR data for S&P 500 for each year beginning with 1991 and expands its coverage to include the largest 1000 and 3000 US companies in 2001 and 2003, respectively. Finally, the Institutional Shareholder Service (ISS) Directors Database which is employed to retain information on board of directors' characteristics covers the universe of S&P1500 companies.

To ensure that the firms are US-based and publicly traded companies, following previous research, the sample is restricted to include firms with CRSP share code of 10 and 11[1] (Fama & French, 2001; Ince & Porter, 2006). For firms with more than one issue of common shares, the issue with the longest history and largest market capitalisation (*MV*) is selected. To be consistent with prior studies, firms with negative book-to-market ratio are excluded from the sample (Lee, 1997), leaving us with the final sample of 48,598 firm-year observations on 3,097 unique firms.

### 1.3.2 Measuring Corporate Governance

Firm's governance quality is not straightforward to measure, but as discussed in the previous section, this study has identified six proxies that can assist us to evaluate the quality of board's decisions and governance quality of firms. This section discusses how these proxies are

[1] 86% of the CRSP observations have a share code equal to 10 or 11. As summarised by Ince and Porter (2006), CRSP variable of share code "SHRCD" can take other values as follows which are now eliminated from the sample:

| | | |
|---|---|---|
| 12 | = | Common Stock, incorporated outside US |
| 13 | = | Common stocks, Americus trust components |
| 14-15 | = | Closed end funds |
| 18 | = | REITs |
| 20-78 | = | Certificates, ADRs, SBIs, & Units |

measured in detail. To rule out the possibility that these indices are driven by other market or firm-specific characteristics rather than governance quality, each sub-index is first regressed on the relevant market or firm characteristics and new governance variables are created using the respective regression residuals[2]. These new variables are then used in the governance index calculation. All regressions are estimated with fixed effects specifications, year dummies and robust standard errors, and all variables are winsorised at 1% and 99% levels to limit the impact of outliers. Summary statistics of the employed variables and the results of the sub-index regressions can be found in Tables II and III in the Appendix.

#### 1.3.2.1 Information Disclosure and Financial Reporting Quality

To evaluate the performance of the boards with respect to their firm's financial reporting quality, I use discretionary accruals arguing that firms with good financial reporting quality are expected to have lower discretionary (unexpected) accruals. Discretionary accruals are calculated as the absolute value of the residuals of the following regression model which isolates the amount of total accrual that can be considered unexpected (adapted from Larcker, Richardson, and Tuna (2007)):

$$TA_{it}=\alpha + \beta_1(\Delta Sales_{it} - \Delta Rec_{it}) + \beta_2 PPE_{it} + \beta_3 OCF_{it} + \beta_4 BM_{it} + \varepsilon_{it} \quad (1.1)$$

In this mode, *TA* is the total accruals for each firm in year t, measured as the difference between cash flow from operating activities (operating activities, net cash flow minus extraordinary items and discontinued operations) and income before extraordinary items. $\Delta Sales$, $\Delta Rec$, *PPE* and *OCF* account for the change in sales and accounts receivables, the gross amount of Property, Plant, and Equipment, and operating cash flows, respectively. Finally, *BM* represents the book value of equity over the market value of equity (*MV*). The market value of equity is calculated by multiplying the number of shares outstanding times the share price. All variables are scaled to total assets. The residuals of this regression create a new variable named *Accruals* which will be employed as a proxy (sub-indicator) for corporate governance quality in further analysis.

[2] See Table I in the Appendix for a detailed definitation of the employed variables.

#### 1.3.2.2 Capital Expenditures, Mergers, and Acquisitions

The acquisition announcement period abnormal stock return is used as a measure (sub-indicator) to evaluate the quality of board's decision making when it comes to M&As. This study calculates the Cumulative Abnormal Returns (CARs) of the firm's major acquisitions and argues that acquiring firms with better governance quality is expected to provide higher abnormal returns for their shareholders.

Abnormal return is defined as the difference between the actual ex-post return of a security and the normal (expected) return over a set period of time (event window). The event window is considered to be seven days, three days before to three days after the acquisition announcement (-3 +3). The abnormal return for firm *i* and announcement date *t* is calculated as (MacKinlay, 1997):

$$AR_{it} = R_{it} - ER_{it} \quad (1.2.1)$$

Where $AR_{it}, R_{it}$ and $ER_{it}$ are abnormal, actual and expected returns, respectively. The normal returns are the expected returns of securities without the condition of the event occurring.

Prior research on asset pricing models suggests that apart from the overall market performance, stock returns may be influenced by systematic factors such as size and value of the firm. More specifically, historical data on average returns show that small firms with high book-to-market ratio tend to perform better (Fama & French, 1993). Furthermore, stock prices show a tendency to continue rising if they are going up and continue declining if they are going down (i.e. exhibit momentum) (Carhart, 1997). To account for these systematic risks that can impact stock returns expected returns are calculated using the Fama-French-Carhart four-factor model (Carhart, 1997; Fama & French, 1993); with the estimation period of 60 days to 30 days (-60 -30) before the acquisition announcement date (i.e. event date). For each firm *i* on day *t*, this model is specified as:

$$ER_{it} = R_{ft} + \beta_1(Mkt_t - R_f) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 UMD_t + \varepsilon_{it} \quad (1.2.2)$$

Where $ER_{it}$ and $R_{ft}$ are expected return on assets and risk-free rates. $Mkt_t, SMB_t, HML_t$ and $UMD_t$ are risk factors representing return on stock market (to capture market effect), Small Minus Big (to capture size effect), High minus Low (to capture value effect) and Up Minus Down (to capture momentum effect), respectively.

Cumulative abnormal returns *(CARs)* are computed as the sum of the daily abnormal returns for the seven-day event period:

$$CAR_{i\,(t1-t7)} = \sum_{t=t1}^{t7}(AR_{it}) \quad (1.2.3)$$

Apart from systematic risks, deal characteristics can also impact acquisition returns. Larger deals, for instance, are often associated with higher returns (Schmidt, 2015). The CARs of acquisitions is regressed on their deal size (measured as the value of the deal over the market value of the acquirer) and the regression residuals are used to construct a new variable named *CARs.* This variable will be employed in constructing the governance index.

Data on M&As are obtained from SDC and matched with CRSP daily return files. Following (Schmidt, 2015), only completed deals with values greater than US$10 million have been included where the acquirer controlled less than 50 per cent of the target before the announcement and owns 100 per cent of the target's shares after the transaction. Data on Fama-French and Carhart risk factors are retrieved from Kenneth French's website[3].

#### 1.3.2.3 Capital Structure

To measure governance quality in the capital structure category, this study uses the ratio of stockholder equity to firm's total capital *(Equity Financing)* to establish what proportion of the firm's total capital is achieved through equity financing. It is hypothesised that higher proportions of equity financing indicate good governance of the firms as explained in Section 1.2.3. Using this ratio in further analysis, however, might raise concerns that not all of the capital structure decisions are associated with the quality of governance. To isolate the effect of governance on capital structure decisions, the *Equity Financing* ratio is regressed on other factors that might influence firms' choice of financing.

Previous research has documented that firm characteristics such as size, profitability, growth opportunities and asset tangibility can affect its capital structure decisions. Chang et al. (2014) demonstrate that larger firms tend to have higher leverage ratios, as they have better access to debt markets because of their high level of transparency and low asset volatility (p. 378). The impact of profitability on leverage, however, is not as straightforward. On the one hand, higher

[3] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

earnings reduce the need for debt resulting in lower leverage ratios. On the other hand, debt can be more affordable for profitable firms considering their relatively high cash flows. Thus, profitable firms are more likely to opt for leverage (Chang, Chen, Chou, & Huang, 2015, p. 48).

Alves et al. (2015) rely on agency theory to show that firm's with higher growth opportunities use more external equity as compared with debt. They argue that these firms are more able to replace low-risk assets with high-risk investments (asset substitution) or forgo valuable investment opportunities (underinvestment), thereby passing the unforeseeable risk on bondholders (p. 10). With regards to the tangibility of assets, firms with more tangible (fixed) assets should have relatively higher debt capacity since they are more attractive from the point of view of creditors (Chang et al., 2014). Firms' industry characteristics might also influence their capital structure. According to Frank and Goyal (2009), firms opt for more leverage in industries in which the median firm is highly leveraged. To account for industry effects, I classify firms into 48 categories using the Fama-French 48-industry classification scheme based on their historical Standard Industrial Classification (SIC) codes and calculate firms' industry median leverage.

I, therefore, use the following model to segregate the part of capital structure decisions that may not be directly related to governance. Thus, I refer to the residuals of this regression as being the result of firms governance quality. This generates a new variable "*Equity*" which in the next part will be used to construct the governance index.

$$Equity\ Financing_{it} = \alpha + \beta_1 Size + \beta_2 Profitability_{it} + \beta_3 Growth_{\ it} + \beta_4 Tangible_{it} + \beta_5 Ind - leverage_{it} + \varepsilon_{it} \quad (1.3)$$

*Equity Financing* is the ratio of the common/ordinary equity to firm's total capital. Size is the natural logarithm of firms' total assets. As a measure of profitability, I use Return on Assets (*ROA*) measured as firm's operating income over its total assets. *Growth* represents firm's sales growth, measured the ratio of current minus previous year's sales, all divided by previous year's sales. *Tangible* is the sum of net Property, Plant and Equipment (*PPE*) and inventories over total assets. Finally, *Ind-Leverage* is firms' industry median leverage calculated based on Fama-French 48 industry classification.

#### 1.3.2.4 Executive Compensation

Excess compensation is used as a measure (sub-indicator) of governance quality in the executive compensation category, arguing that firms with effective boards pay lower levels of excess compensation to their CEOs. As discussed earlier, excess compensation can be defined as part of the executives' total compensation that is not associated with firm and individual CEO characteristics. To calculate the amount of excess compensation, CEO total annual compensation is regressed on different firm and CEO specific characteristics influencing their pay and consider the residual as a proxy of firm's governance quality.

Firm size, performance and book-to-market value are included to control for firm characteristics that affect executive pay arguing that executives of larger firms with better financial performance and higher growth potentials receive higher compensation (Renneboog & Zhao, 2011; Schwartz-Ziv & Weisbach, 2013). As proxies for executives' individual characteristics, I use executives' tenure and equity incentives. It is expected that CEOs with longer tenure receive higher pay as they need to be compensated for the company-specific experience. They also might have more influence on their pay (Renneboog & Zhao, 2011, p. 1135). However, as Armstrong, Ittner, and Larcker (2012) demonstrate, CEOs' equity incentives may impact their overall compensation level in two different ways. Compensation level may be lower in situations where the CEO's existing equity incentives are high enough and thus there is no need for additional incentives using annual compensation. Yet, there is also the possibility that equity incentives provide CEOs with additional power over the board of directors leading to higher compensation levels (p. 330). The regression model is specified as follows:

$$Compensation = \alpha + \beta_1\, Size_{it} + \beta_2\, Profitability_{it} + \beta_3 BM_{it} + \beta_4 CEO\ Tenure_{it} + \beta_5\, Incentives_{it} + \varepsilon_{it} \quad (1.4)$$

*Compensation* is CEOs' total compensation which includes salary, bonus, other annual pay, the value of restricted stock and options granted, long-term incentive payouts and all other compensation. *Size*, *Profitability* and *BM* are measured as the natural logarithm of total assets, Return on Assets (ROA) and the book value of equity over the market value of equity. *CEO Tenure* is measured as the number of years the CEO has held the title of chief executive officer. *Incentives* is a measure of CEO firm-specific wealth. This is the sum of the value of CEOs' option portfolio calculated using the Black-Scholes formula, and equity portfolio estimated by

multiplying the number of shares held by share price[4]. The residuals of model (1.4) generate a new variable called "*Excess Comp"* which will be used as a proxy (sub-indicator) to construct the governance index.

#### 1.3.2.5 Firm's General Financial Outcomes

Following Larcker et al. (2007), this study uses firm's ROA as a proxy for their overall financial performance and hypothesise that firms with more effective corporate governance experience better financial performance. To isolate the impact of governance on operating performance, ROA is first regressed on firm and industry-specific factors that are, according to the literature, expected to influence firm financial performance but may not be directly related to governance.

Following previous research on operating performance, firm size, book-to-market value, age and capital expenditure are included in the model to control for cross-sectional differences that are correlated with profitability (Core, Guay, and Rusticus (2006); Gompers et al. (2003); Conheady, McIlkenny, Opong, and Pignatel (2015); and Schultz, Tan, and Walsh (2010)). The model is specified as:

$$Profitability = \alpha + \beta_1 Size_{it} + \beta_2 BM_{it} + \beta_3 Age_{it} + \beta_4 CAPEX_{it} + \varepsilon_{it} \quad (1.5)$$

*Size* and *BM* are measured as the natural logarithm of total assets and the book value of equity over the market value of equity. *Age* is calculated as the natural logarithm of firms' age in years from the first date the firm appeared in the CRSP database. *CAPEX* is firms' capital expenditure divided by its total sales.

Whether these factors can influence performance in a positive or negative way is still subject to controversy. Smaller firms may have higher operational performance because of their greater growth potential. Larger firms, however, have diverse capabilities, can benefit from economies of scale and scope and are more likely to adopt better corporate governance practices which can lead to better performance (Conheady et al. (2015, p. 294); Majumdar (1997, p. 233)). With respect to the effect of age, theory suggests that older firms can take advantage of greater experience to achieve superior performance. At the same time, their limited bureaucratic

[4] Data for *Incentives* variable is retrived from Coles, Daniel, and Naveen (2013): https://sites.temple.edu/lnaveen/data/

flexibility makes it harder for them to make rapid adjustments to changing circumstances and thus, can lead them to lose out to their younger competitors (Majumdar, 1997).

Larger capital expenditure can bring about future growth opportunities and result in better financial outcomes. On the contrary, Titman, Wei, and Xie (2004) report evidence that firms with more capital expenditures tend to underperform their benchmarks. They argue that high levels of capital expenditures can be linked to managers' empire-building tendencies where they invest based on their own rather than the shareholders' interests.

Moreover, Fama and French (1995) show that firms with a high book to market ratio (i.e. low stock price relative to book value) are relatively distressed and less profitable compared to low book-to-market ratio firms who enjoy sustained profitability (p. 154). The residuals of equation (1.5) are employed to create a new variable called "*Performance.*" This variable is used in the next stage towards constructing the governance index.

#### 1.3.2.6 Non-financial Measures of Performance: Corporate Social Responsibility (CSR)

Firms with good corporate governance are expected to have better CSR activities and better reputation. To assess board's effectiveness in terms of CSR issues, this study uses the KLD sustainability rankings. The KLD Socrates Database provides rankings for companies in seven social performance areas: Community, Corporate Governance, Diversity, Employee Relations, Environment, Human Rights and Product Quality and Safety. For each area, KLD assigns 'strengths' and 'concerns' on a 5-point scale. Following Filatotchev and Allcock (2010), the final score in each category is computed by subtracting the 'concerns' scores from the 'strength' score and use the average of these seven final scores to obtain a single value for each firms' CSR. Higher values for the overall score indicate better performance in terms of corporate social responsibility.

Apart from governance attributes, a number of firm-related characteristics including firms' accounting performance, growth, size and leverage ratio have been shown to influence the adoption of CSR practices. Therefore, firms' total CSR scores are regressed on these firm-specific factors and the residuals are used as part of CSR values that can be linked to governance quality of firms. I label the new variable "*Non-financial*" and use it as another sub-indicator to construct the governance index. The model is specified as:

$$CSR = \alpha + \beta_1 Size_{it} + \beta_2 Profitability_{it} + \beta_3 BM_{it} + \beta_4 Leverage_{it} + \varepsilon_{it} \quad (1.6)$$

*Size*, *Profitability* and *BM* are measured as the natural logarithm of total assets, Return on Assets (ROA) and the book value of equity over the market value of equity. *Leverage* is calculated as the ratio of firms' total liabilities over its total assets. Better financial performance could assist firms in undertaking costly programs that are related to social demands (Mallin & Michelon, 2011). Large growing firms are probably more diversified across different markets and, thus, are more likely to be under their different stakeholder groups' scrutiny. Size can also be viewed as a measure of public visibility. Therefore, large firms are more likely to adopt CSR activities and disclosure to improve their reputation (Branco & Rodrigues, 2008). Leverage has been shown to influence CSR disclosure in a positive way whereby firms that are highly leveraged may voluntarily disclose more social information in order to reduce their agency costs and therefore, their cost of capital (Reverte, 2009, p. 357). On the contrary, companies with higher levels of debt are more susceptible to insolvency risks and may be reluctant to pay the additional costs of CSR activities and disclosures.

### 1.3.3 Principal Component Analysis (PCA)

Corporate governance is often referred to as a complex concept driven by several contributing factors each of which offers a limited picture of the overall governance quality. Therefore, when analysing corporate governance, one is dealing with numerous supervision and control structures that need to be taken into account. However, as Tarchouna, Jarraya, and Bouri (2017) argue, the simultaneous introduction of many variables into the model can cause statistical problems (p. 646).

Prior literature, therefore, mainly focuses on generating single additive indices using different governance attributes. Further, although there is no well-developed conceptual basis on how much each governance element contributes to the overall index, the most common procedure is to provide equal weights for each attribute (e.g. Gompers et al., 2003). Other studies, on the other hand, recognised PCA as an appropriate method for evaluating the entire governance system. Larcker et al. (2007), for instance, argue that a PCA-based governance index is as a more reliable measure compared to simple or weighted additive indices.

Follow Larcker et al. (2007), this study uses PCA to construct the governance index. The outcome of this analysis is a new set of uncorrelated variables called, the Principal Components (PCs). The first principal component is simply the linear combination of the variables with the maximum variance that capture most of the variations in the original data set. Correspondingly,

the second and third principal components cover as much of the remaining variation as possible.

This is an accepted technique for reducing the dimensions of a dataset with a large number of interrelated variables while retaining the utmost variation present in the data (Jolliffe, 2002). This method could be especially advantageous for studying corporate governance, as endogeneity and correlation between the variables are inseparable parts of almost all corporate governance discussions. Another advantage of using PCA is that using statistical procedures, it automatically produces weights for each governance attribute in a way that the final index captures as much of the variance in individual governance attributes (Florackis & Ozkan, 2009).

Before conducting PCA, however, it is important to check the validity of this method using the two statistical tests of Bartlett's sphericity and Kaiser-Meyer-Oklin's (KMO's) sampling adequacy. Bartlett's test examines whether the correlation matrix is statistically significant from zero (i.e. the correlation matrix is different statistically from the identity matrix). The p-value of this test should be less than 5% in order to reject the null hypothesis that the variables are uncorrelated and the correlation matrix is not factorable. The KMO measure of sampling adequacy, on the other hand, is an index valued between 0 and 1 representing the degree of common variance among the original variables. This statistic should be above 0.5 to ensure that PCA produces reliable results, otherwise, the correlation matrix is not applicable (Tarchouna et al., 2017). After conducting PCA, following Florackis and Ozkan (2009) and Tarchouna et al. (2017) the first principal component is taken as a governance index, hereafter called *Governance Index* (*GI*), given that it explains the largest percentage of common variation among the governance sub-indices.

## 1.4 Results

### 1.4.1 Corporate Governance Index

Sections 1.3.1 and 1.3.2 explain the construction of the six governance sub-indices in details. Table 1.1 summarises these governance proxies and indicates their expected sign in good governance. As mentioned before, acquisition returns, equity financing and financial and non-financial performance are classified as increasing in "good" governance; while abnormal accruals and CEO's excess compensation are expected to be lower as governance quality of firms improves.

**Table 1.1 Corporate Governance Sub-indices and their expected sign in good governance**

| Variable | Proxy for | Expected Sign |
|---|---|---|
| *Accruals* | Financial Reporting Quality | - |
| *CARs* | Acquisition Performance | + |
| *Equity_Ratio* | Capital Structure and Financing Decisions | + |
| *Excess_Comp* | CEOs Excess Compensation | - |
| *Financial* | Financial Performance | + |
| *Non_financial* | Non-financial Performance | + |

Table 1.2 reports the results of Bartlett's sphericity test which rejects the null hypothesis that the correlation matrix is not factorable (p-value 0) and KMO's sampling adequacy index confirming the appropriateness of PCA.

**Table 1.2 Results of Bartlett Sphericity and KMO's Sampling Adequacy Tests**

| | |
|---|---|
| Bartlett Test of Sphericity | |
| Chi-square | 93388.013 |
| Degree of freedom | 15 |
| p-value | 0.000 |
| H0: Variables are not intercorrelated | |
| Kaiser-Meyer-Oklin Measure of Sampling Adequacy | |
| KMO | 0.500 |

The loadings of the first principal component are employed to form the index of corporate governance. Component loadings represent the relationship between each variable to the underlying factor. In other words, they show how much of the variation in the original variable is explained by each component. The resulting index is:

$$Governance\ Index\ (GI) = -0.172\ Accruals + 0.462\ CARs + 0.520\ Equity\_Ratio - 0.579\ Excess\_Comp + 0.380\ Financial + 0.076\ Non\_financial \quad (1.7)$$

Our results indicate that the first principal component is a linear combination of all of the six governance sub-indices and explains 28 per cent of the variance of data. The loadings signs of the first component are consistent with what has been expected. First, *Accruals* appears with a negative loading confirming our assumption that well-governed firms have lower discretionary accruals and therefore better financial reporting quality. *CARs* has a positive weight in the governance index which implies that well-governed firms contribute to higher returns for their shareholders when it comes to M&As. The large positive loading of *Equity_Ratio* is also consistent with our expectation that firms with better governance quality have a preference for choosing equity financing. *Excess_Comp* contributes negatively to the governance measure. This is again consistent with prior literature that firms with effective

boards can determine CEO compensation plans more efficiently and thus, pay lower levels of excess compensation to their CEOs. The *Financial* and *Non_financial* sub-indicators appear to be positively related to the corporate governance measure albeit the CSR loading is small. The detailed results of the PCA estimation can be found in Table IV in the Appendix.

Table 1.3 provides summary statistics of the six sub-indices, the governance index, and their correlation matrix. The governance index is highly correlated with each governance sub-indicator with correlation signs being as expected. Pearson and Spearman correlations among the index components are, also, quite similar but small in value. The relatively low values of correlation coefficients among the sub-indices suggest that these governance proxies are statistically distinct each capture different features of the firms' governance system.

**Table 1.3 Summary Statistics of Governance Index and its Correlation with Sub-indices**

This table presents summary statistics for the constructed governance index (*Index*) and reports its correlation with each governance measure as well as the correlation among governance sub-indices. The first sub-index (*Accruals)* represents financial reporting quality in firms and is measured by the value of abnormal accruals. The second measure (*CARs*) represents acquisition performance as cumulative abnormal returns three days before and after the acquisition announcements. The third measure (*Equity_Ratio*) is the ratio of equity financing in firms representing capital structure and financing decisions of the firms. The fourth measure (*Excess_Comp*) is the amount of excess compensation paid to the CEOs. Excess compensation is defined as part of the total compensation that cannot be explained by firm or CEO characteristics. The fifth and sixth measures (*Financial* and *Non_financial*) are firms' ROA and corporate social responsibility scores representing financial and non-financial performance, respectively. Pearson and Spearman's correlations are presented in the Lower (Upper) Diagonal. Numbers in parentheses represent robust standard errors and * indicates significance at 5 per cent level.

| | | | | | Correlation with Governance | | Correlations with Governance sub-indices [a] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Min | Max | *Index* (Pearson) | *Index* (Spearman) | *Accruals* | *CARs* | *Equity_ Ratio* | *Excess_ Comp* | *Financial* | *Non_ financial* |
| *Accruals* | 0.052 | 0.056 | -0.197 | 0.294 | -0.222* | -0.189* | | 0.074* | -0.117* | 0.012 | -0.175* | -0.110* |
| | | | | | (0.000) | (0.000) | | (0.000) | (0.000) | (0.139) | (0.000) | (0.000) |
| *CARs* | 0.125 | 0.051 | 0.014 | 0.237 | 0.596* | 0.583* | -0.006 | | 0.042* | -0.448* | 0.290* | -0.215* |
| | | | | | (0.000) | (0.000) | (0.409) | | (0.000) | (0.000) | (0.000) | (0.000) |
| *Equity_Ratio* | 0.455 | 0.089 | 0.163 | 0.680 | 0.671* | 0.637* | -0.106* | 0.005 | | -0.357* | 0.314* | 0.207* |
| | | | | | (0.000) | (0.000) | (0.000) | (0.488) | | (0.000) | (0.000) | (0.000) |
| *Excess_ Comp* | 7.947 | 0.685 | 5.659 | 10.045 | -0.748* | -0.747* | 0.029* | -0.453* | -0.385* | | 0.030* | -0.161* |
| | | | | | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | | (0.000) | (0.000) |
| *Financial* | 0.089 | 0.039 | -0.151 | 0.205 | 0.492* | 0.498* | -0.265* | 0.246* | 0.388* | 0.008 | | 0.140* |
| | | | | | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.209) | | (0.000) |
| *Non_ financial* | 0.036 | 0.114 | -0.251 | 0.438 | 0.099* | 0.194* | -0.087* | -0.209* | 0.333* | -0.153* | 0.166* | |
| | | | | | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | |

### 1.4.2 Corporate Governance and Board of Directors Characteristics

Here, the constructed governance will be employed to examine whether different characteristics of the board of directors can impact their efficacy (as measured by the index). The model is specified as:

$$Governance\ Index_{it} = \alpha + \beta_1\ Board\ Characteristics_{it} + \beta_2\ Controls_{it} + \varepsilon_{it} \quad (1.8)$$

Drawing on prior studies (Adams et al., 2010; Coles, Daniel, & Naveen, 2008; Larcker et al., 2007), the following variables are selected to represent board structure and their individual characteristics that may have an influence on their overall performance:

*Board_Size* = Board size measured as the total number of directors serving on the board;

*Independent* = Fraction of board members comprised of independent directors;

*Female* = Fraction of board members comprised of female directors;

*Busy* = Fraction of directors holding three or more directorship appointments at different publicly traded firms;

*Old* = Fraction of directors who are older than 70 years old;

*CEO_Dual* = CEO duality; dummy variable equals to 1 if CEO is also the chairman and zero otherwise;

*Dir_Own* = Directors' stock ownership measured as the fraction of outstanding shares held by all directors over the total number of shares outstanding.

To control for additional cross-sectional differences, I include variables measuring firm size, age, value and risk. *Size* is measured as the natural logarithm of firms' total assets. *Age* is the natural logarithm of firms' age in years from the first date the firm appeared in the CRSP database. *MB* is the market value of equity (*MV*) over book value of equity and *Risk* is measured as the standard deviation of CRSP's monthly stock returns.

Table 1.4 provides summary statistics of the board's characteristics. According to the reported statistics, the median board has 9 members with near 75% of the directors being independent. On average, around 12% of the directors are aged above 70 years old and 8% hold three or more directorship appointments at different publicly traded firms. Female directors represent 11% of board members, and around 66% of CEOs hold the position of the

board chairman, as well. Finally, average directors own near 7% of the outstanding shares. These numbers are similar to those in recent studies. Sila, Gonzalez, and Hagendorff (2016) report a median board of 9 members with 71% board independence and 10% female boardroom representation in their sample of US firms from 1996-2010. Similarly, Faleye, Hoitash, and Hoitash (2018) report that for the period 2000-2009 the median board has 9 members, 75% of the directors are independent, on average boards own 8.7% of the outstanding shares, and around 62% of the CEOs serve as board chairman.

**Table 1.4 Board of Directors Structure: Descriptive Statistics**

This table provides summary statistics of the board characteristics variables. *Board_Size* represents the total number of board members. *Indep* is the fraction of outside directors. In Risk Metric database, directors are required not to have any personal and financial connection to the company other than a board seat in order to be classified as independent. *Female* is the fraction of female directors. *Old* represents the fraction of directors who are older than 70 years old. *Busy* is the fraction of directors that hold three or more directorship appointments at different publicly traded firms. *CEO_Dual* is a dummy variable that equal to 1 if the CEO is also the chairman; and zero otherwise. *Dir_Own* is the proportion of shares outstanding owned by directors.

| Board Characteristics | Mean | SD | 25th Percentile | 50th Percentile | 75th Percentile |
|---|---|---|---|---|---|
| *Board_Size* | 9.532 | 2.727 | 8.000 | 9.000 | 0.857 |
| *Independent* | 0.718 | 0.164 | 0.625 | 0.750 | 0.167 |
| *Female* | 0.106 | 0.099 | 0.000 | 0.100 | 0.200 |
| *Old* | 0.123 | 0.144 | 0.000 | 0.100 | 0.125 |
| *Busy* | 0.082 | 0.113 | 0.000 | 0.000 | 0.075 |
| *CEO_Dual* | 0.658 | 0.474 | 0.000 | 1.000 | 0.857 |
| *Dir_Own* | 0.072 | 0.150 | 0.007 | 0.024 | 1.000 |

What board characteristics can be considered “optimal” and whether they can bring about the desired firm outcome has long been subject to controversy. For example, one might expect large boards to be favoured, as they can bring different perspectives into the firm. But large boards may lead to higher costs of coordination and encounter social loafing problems (Coles et al., 2008). Coles et al. (2008), find a U-shaped relationship between board size and firm value and show that depending on firm characteristics, either a small or large board can be optimal. In a similar vein, while independent directors possess greater propensity to monitor the management (Adams et al., 2010), inside directors may prove to be more valuable as they have more insight regarding the business day-to-day operation (Byrd & Hickman, 1992, p. 196). Theory, also, does not provide a clear prediction on how board members’ stock ownership

can influence firm value (Morck, Shleifer, & Vishny, 1988). Although a higher level of equity ownership is expected to provide board members with more voting power and improved incentives towards value maximisation, Morck et al. (1988) found a nonlinear relationship between director's share ownership (with a positive relation in the 0 to 5% ownership range, a negative relation in the 5 to 25%, and a further positive relation beyond 25%).

Prior literature links these contradicting findings to statistical difficulties in measuring governance and endogeneity issues (e.g. Adams et al. (2010); Hermalin and Weisbach (2003) and Wintoki et al. (2012)). Board size and structure, for instance, might be endogenously determined by other factors such as firms' characteristics or CEO preferences. Complex firms, for example, tend to have larger boards with more independent directors due to their greater advisory needs (Coles et al., 2008) and good CEOs may want to please shareholders by dressing up their firms' boards with independent directors (Byrd & Hickman, 1992).

Wintoki et al. (2012) classify three potential sources of endogeneity: unobserved heterogeneity, simultaneity and dynamic endogeneity. Unobserved heterogeneity exists when the relationship between the variables is affected by other *unobservable* factors. In the governance-performance analysis, it is very likely that unobserved firm-specific factors influence both governance and performance, hence Ordinary Least Square (OLS) estimation results may be biased. The issue of simultaneity arises when the dependent and the explanatory variables are simultaneously determined. In the governance-performance relation, this seems to be a relevant concern as firms often choose their optimum board structure with the aim of achieving an expected level of performance. Thus, although we expect board structure to influence their performance, performance itself can be a determinant of structure. The third source of endogeneity is related to the dynamic nature of governance, where the current governance quality is a function of previous periods' performance.

A fixed-effect analysis can probably address the issue of unobserved endogeneity. However, Schultz et al. (2010) argue that the fixed effects model is implemented under the strict assumption of exogeneity which presumes that the explanatory variables (board structure and control variables) are independent of the past, present or future values of performance. As discussed above, the issues of simultaneity and dynamic endogeneity in the governance-performance relation will result in this assumption to be violated. In this case, the fixed-effect model estimates are not reliable.

Therefore, employing a Generalised Method of Moments (GMM) estimator can be beneficial for governance-related analysis where endogeneity is present. Schultz et al. (2010) argue that system GMM can provide consistent estimates that are robust to the potential unobservable endogeneity, simultaneity and dynamic endogeneity. In this model, lags of the dependent variable are added as additional explanatory variables to capture autoregressive dynamics (persistence), all variables are first differenced to eliminate unobserved firm characteristics, and the lagged values of the explanatory variables are included as instruments for the current explanatory variables.

Following Wintoki et al. (2012), this study performs two sets of tests to empirically examine the exogeneity assumption. First, current board characteristics are regressed on the historical values of governance and firm-specific (i.e. control) variables. The results, as shown in Table 1.5, indicate that most of the board characteristic and firm-specific variables are related to the historic values of governance, board characteristics or firm-specific factors. This highlights the fact that apart from the board structure variables, the potential control variables are also dynamically endogenous.

I, then, carry out a second test of strict exogeneity suggested by Wooldridge (2010, p. 285). In this test, the current governance is regressed on current as well as future values of board characteristics and control variables. Under the null hypothesis of strict exogeneity, the future values of board structure and control factors should be independent from current governance. As shown in Table 1.6, governance, as the dependent variable can explain the future values of some of the board characteristics and firm-specific variables. For example, the future value of the variable *Dir_Own* has a significant coefficient of -0.270 in the final specification (M8), indicating that this variable is not strictly exogenous and adjusts to the past values of governance.

**Table 1.5 The Relationship between Board Characteristics, firm-specific variables and past governance**

This table reports the results of OLS regressions of the current values of board characteristics and firm-specific variables on the lagged values of governance (*GI*) and firm-specific variables. *Board_Size* represents the total number of board members. *Independent* is the fraction of outside directors. In Risk Metric database, directors are required not to have any personal and financial connection to the company other than a board seat in order to be classified as independent. *Female* is the fraction of female directors. *Old* represents the fraction of directors who are older than 70 years old. *Busy* is the fraction of directors that hold three or more directorship appointments at different publicly traded firms. *CEO_Dual* is a dummy variable that equal to 1 if CEO is also the chairman; and zero otherwise. *Dir_Own* is the proportion of shares outstanding owned by directors. Firm-specific variables include *Size, Age, MB and Risk*. Year and industry dummies are included in all regressions. *, **, *** indicates significance at the 10 per cent, 5 per cent, and 1 per cent, respectively and Numbers in parentheses represent robust standard errors.

| | *Board_ Size* | *Independent* | *Female* | *Old* | *Busy* | *CEO_ Dual* | *Dir_Own* | *Age* | *MB* | *Risk* | *Size* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *GI (t-1)* | -0.018 | 0.001 | 0.001 | 0.000 | 0.002 | 0.004 | -0.007*** | 0.002 | 0.023 | -0.017*** | 0.049*** |
| | (0.032) | (0.002) | (0.001) | (0.002) | (0.002) | (0.010) | (0.002) | (0.001) | (0.044) | (0.002) | (0.006) |
| *Board_Size (t-1)* | 0.822*** | 0.000 | 0.000 | 0.001 | 0.001* | -0.005** | 0.000 | 0.000** | -0.007 | -0.001*** | -0.001 |
| | (0.010) | (0.000) | (0.000) | (0.000) | (0.000) | (0.002) | (0.000) | (0.000) | (0.000) | (0.000) | (0.001) |
| *Independent (t-1)* | 0.000 | 0.766*** | 0.003 | -0.021*** | 0.020*** | 0.079** | -0.016* | 0.014*** | 0.087 | -0.003 | -0.030 |
| | (0.095) | (0.008) | (0.004) | (0.006) | (0.006) | (0.027) | (0.007) | (0.003) | (0.134) | (0.004) | (0.018) |
| *Female (t-1)* | 0.225 | 0.034*** | 0.870*** | -0.046*** | -0.007 | 0.129*** | -0.005 | 0.022*** | 0.372* | -0.003 | -0.106*** |
| | (0.127) | (0.008) | (0.006) | (0.009) | (0.009) | (0.039) | (0.007) | (0.004) | (0.158) | (0.005) | (0.023) |
| *Old (t-1)* | -0.094 | -0.019*** | -0.003 | 0.831*** | -0.006 | 0.006 | 0.006 | -0.009*** | -0.050 | -0.006* | 0.019 |
| | (0.082) | (0.005) | (0.003) | (0.007) | (0.005) | (0.026) | (0.005) | (0.002) | (0.102) | (0.003) | (0.015) |
| *Busy (t-1)* | -0.098 | 0.031*** | 0.004 | 0.020** | 0.743*** | 0.018 | -0.004 | 0.014*** | 0.194 | -0.003 | -0.034 |
| | (0.107) | (0.007) | (0.004) | (0.007) | (0.009) | (0.027) | (0.005) | (0.003) | (0.127) | (0.004) | (0.018) |
| *CEO_Dual (t-1)* | -0.020 | 0.000 | -0.001 | 0.001 | 0.000 | 0.727*** | -0.001 | 0.001 | 0.014 | 0.000 | 0.006 |
| | (0.022) | (0.002) | (0.001) | (0.002) | (0.001) | (0.008) | (0.001) | (0.001) | (0.030) | (0.001) | (0.004) |
| *Dir_Own (t-1)* | 0.070 | -0.070*** | -0.005 | 0.021** | -0.009 | -0.021 | 0.850*** | 0.004 | 0.241 | -0.013*** | -0.024 |
| | (0.111) | (0.007) | (0.005) | (0.007) | (0.006) | (0.029) | (0.027) | (0.003) | (0.128) | (0.003) | (0.016) |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Age (t-1)* | 0.045** | 0.001 | 0.001 | -0.001 | -0.001 | 0.004 | 0.001 | 0.927*** | 0.051* | -0.003*** | -0.020*** |
| | (0.017) | (0.001) | (0.001) | (0.001) | (0.001) | (0.005) | (0.001) | (0.001) | (0.023) | (0.001) | (0.003) |
| *MB (t-1)* | 0.013** | 0.000 | 0.000 | 0.000 | 0.001* | -0.002 | 0.001* | 0.001** | 0.806*** | 0.001*** | 0.014*** |
| | (0.005) | (0.000) | (0.000) | (0.000) | (0.000) | (0.002) | (0.000) | (0.000) | (0.016) | (0.000) | (0.001) |
| *Risk (t-1)* | 0.539* | -0.030 | -0.014 | -0.017 | 0.014 | 0.004 | -0.031* | 0.019* | -2.275*** | 0.454*** | -0.160** |
| | (0.268) | (0.020) | (0.011) | (0.018) | (0.018) | (0.078) | (0.015) | (0.008) | (0.442) | (0.013) | (0.053) |
| *Size (t-1)* | 0.123*** | 0.001 | 0.003** | -0.001 | 0.006*** | 0.013* | -0.004*** | 0.003*** | -0.006 | -0.011*** | 1.013*** |
| | (0.019) | (0.001) | (0.001) | (0.001) | (0.001) | (0.006) | (0.001) | (0.000) | (0.026) | (0.001) | (0.004) |
| R-squared | 0.823 | 0.793 | 0.808 | 0.722 | 0.655 | 0.597 | 0.811 | 0.999 | 0.726 | 0.539 | 0.986 |

**Table 1.6 Test of Strict Exogeneity**

This table reports the results Wooldridge test of strict exogeneity. The aim is to understand whether board characteristics and firm-specific factors adjust to past governance quality. The dependent variable, *GI (t),* is the governance index, and in addition to board characteristic and control variables, future values of board characteristics and control variables are added as explanatory variables. *Board_Size* represents the total number of board members. *Independent* is the fraction of outside directors. *Female* is the fraction of female directors. *Old* represents the fraction of directors who are older than 70 years old. *Busy* is the fraction of directors that hold three or more directorship appointments at different publicly traded firms. *CEO_Dual* is a dummy variable that equal to 1 if CEO is also the chairman; and zero otherwise. *Dir_Own* is the proportion of shares outstanding owned by directors. Firm-specific variables include *Size, Age, MB and Risk*. Year and industry dummies are included in all regressions. *, **, *** indicates significance at the 10 per cent, 5 per cent, and 1 per cent, respectively and Numbers in parentheses represent robust standard errors.

| | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M8 |
|---|---|---|---|---|---|---|---|---|
| *Board_Size* | -0.007* | -0.006 | -0.006 | -0.006 | -0.006 | -0.006 | -0.005 | -0.006* |
| | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |
| *Independent* | -0.055 | -0.051 | -0.056 | -0.054 | -0.057 | -0.056 | -0.055 | -0.063 |
| | (0.048) | (0.044) | (0.048) | (0.048) | (0.048) | (0.048) | (0.048) | (0.043) |
| *Female* | -0.047 | -0.048 | -0.003 | -0.045 | -0.049 | -0.048 | -0.057 | 0.019 |
| | (0.073) | (0.073) | (0.068) | (0.073) | (0.073) | (0.073) | (0.072) | (0.065) |
| *Old* | 0.05 | 0.049 | 0.05 | 0.011 | 0.053 | 0.05 | 0.05 | 0.002 |
| | (0.041) | (0.041) | (0.041) | (0.04) | (0.041) | (0.041) | (0.041) | (0.04) |
| *Busy* | -0.039 | -0.038 | -0.038 | -0.039 | -0.061 | -0.039 | -0.036 | -0.057 |
| | (0.046) | (0.046) | (0.046) | (0.046) | (0.042) | (0.046) | (0.046) | (0.041) |
| *CEO_Dual* | 0.017 | 0.017 | 0.017 | 0.017 | 0.017 | 0.017 | 0.003 | 0.006 |
| | (0.010) | (0.010) | (0.010) | (0.010) | (0.010) | (0.009) | (0.010) | (0.009) |
| *Dir_Own* | -0.259** | -0.261** | -0.259** | -0.259** | -0.260** | -0.260** | -0.131 | -0.147* |
| | (0.080) | (0.080) | (0.080) | (0.080) | (0.080) | (0.080) | (0.069) | (0.072) |
| *Age* | -0.185*** | -0.184*** | -0.185*** | -0.186*** | -0.183*** | -0.185*** | -0.184*** | 0.193 |
| | (0.031) | (0.031) | (0.031) | (0.031) | (0.031) | (0.031) | (0.031) | (0.286) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| *MB* | 0.076*** | 0.076*** | 0.076*** | 0.076*** | 0.075*** | 0.076*** | 0.076*** | 0.074*** |
| | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) |
| *Risk* | -0.841*** | -0.844*** | -0.845*** | -0.845*** | -0.843*** | -0.845*** | -0.847*** | -0.562*** |
| | (0.122) | (0.122) | (0.122) | (0.122) | (0.122) | (0.122) | (0.122) | 0.116 |
| *Size* | 0.461*** | 0.462*** | 0.462*** | 0.462*** | 0.461*** | 0.462*** | 0.460*** | 0.259*** |
| | (0.015) | (0.015) | (0.015) | (0.015) | (0.015) | (0.015) | (0.015) | (0.020) |
| *Board_Size (t+1)* | 0.000 | | | | | | | -0.002 |
| | (0.003) | | | | | | | (0.003) |
| *Independent (t+1)* | | -0.024 | | | | | | -0.039 |
| | | (0.047) | | | | | | (0.048) |
| *Female (t+1)* | | | -0.028 | | | | | -0.026 |
| | | | (0.070) | | | | | (0.070) |
| *Old (t+1)* | | | | -0.009 | | | | -0.005 |
| | | | | (0.038) | | | | (0.038) |
| *Busy (t+1)* | | | | | -0.018 | | | -0.01 |
| | | | | | (0.040) | | | (0.041) |
| *CEO_Dual (t+1)* | | | | | | 0.013 | | 0.012 |
| | | | | | | (0.010) | | (0.010) |
| *Dir_Own (t+1)* | | | | | | | -0.292*** | -0.270*** |
| | | | | | | | (0.068) | (0.071) |
| *Age (t+1)* | | | | | | | | -0.702* |
| | | | | | | | | (0.349) |
| *MB (t+1)* | | | | | | | | -0.010*** |
| | | | | | | | | (0.003) |
| *Risk (t+1)* | | | | | | | | -0.797*** |
| | | | | | | | | (0.123) |
| *Size (t+1)* | | | | | | | | 0.135*** |
| | | | | | | | | (0.020) |
| *R-squared* | 0.909 | 0.909 | 0.909 | 0.918 | 0.918 | 0.909 | 0.909 | 0.918 |

Overall the results of the two sets of exogeneity tests suggest that the board characteristics and control variables are not strictly exogenous. In the next step, model (1.8) is estimated using simple OLS, fixed-effects, dynamic OLS and GMM specifications.

Table 1.7 reports the regression results of the governance quality measure (*GI*) on different board characteristics and firm-specific factors. The results of the static models suggest a negative relationship between directors' share ownership (*Dir_Own*) and CEO duality (*CEO_Dual)* and their effectiveness. Contrary to previous studies which have suggested a positive relationship between female directors and firm outcomes (e.g. Levi et al., 2014), the significant negative coefficient of the variable *Female* in the fixed effects model suggests that the presence of female directors on the board has an adverse effect on board performance measured by the index.

Although OLS estimation is used by many authors and is appealing for its simplicity, it can only produce reliable results under strict exogeneity assumptions. Schultz et al. (2010, p. 147) argue that the OLS regressions will be biased if there is at least one source of endogeneity. The results of the fixed effect model can, also, be unreliable if some variables are endogenously determined in the model.

As static models cannot control for persistence in governance performance, I now turn to use dynamic models. In the first step, a dynamic OLS is estimated where the past (i.e. lagged) values of the governance index are added to the model as additional explanatory variables[5]. The coefficients of first and second lags of governance ($\beta$=0.6 and $\beta$=0.033) are statistically significant at 1% and 10% levels which show that past values of governance can significantly explain variations in current governance. The results of the dynamic OLS regression with regards to directors share ownership and CEO duality remains unchanged from what is found in the static models. However, once we control for the impact of past governance quality, the variable *Female* appears with a significant positive coefficient which is now consistent with

[5] To determine how many lags of governance are needed to capture the dynamic effects, regressions of current governance on up to four lags of past governance were estimated, controlling for other firm-specific characteristics. The results confirm that only the first two lags of governance are statistically significant, and thus, inclusion of two lags of governance is sufficient to ensure dynamic completeness. More than two period lags of governance are, therefore, deemed exogenous and can be used as instruments when applying the dynamic panel GMM model.

our expectations. Still, the dynamic OLS model cannot control for unobserved heterogeneity or simultaneity.

I, finally, move forward to use a dynamic panel GMM model, which according to Wintoki et al. (2012) enables us to account for unobserved heterogeneity, simultaneity and dynamic endogeneity. Again, I use two lags of governance in the model and include variables lagged three and four periods as instruments for the endogenous variables. The results show that when potential sources of endogeneity are controlled for using system GMM, all board characteristics coefficients become insignificant. These results are consistent with the findings of Wintoki et al. (2012) among others who find no statistical association between board characteristics and firm performance.

Table 1.7 also reports the results of three GMM estimator validity tests to confirm that the GMM results are reliable: the Arellano-Bond Test for second-order serial correlation (AR (2) test), the Hansen J Test of over-identification and difference-in-Hansen test of endogeneity. First, the AR (2) test yields a p-value of 0.69 which cannot reject the null hypothesis of no second-order serial correlation. Similarly, the p-value of 0.17 for the Hansen J Test of over-identification means that we cannot reject the null hypothesis that the instruments are valid. Finally, with regards to the difference-in-Hansen test of endogeneity, the null hypothesis is that subsets of the instruments are economically exogenous. The p-value of 0.143 cannot reject this hypothesis.

**Table 1.7 Corporate Governance and Board Structure**

This table contains static OLS, Fixed-effects, dynamic OLS and system GMM estimations of the relationship between governance quality and board structure. Year dummies and industry fixed-effects are included in all specifications. *, **, *** indicates significance at the 10 per cent, 5 per cent, and 1 per cent, respectively and Numbers in parentheses represent robust standard errors.

| Dependent Variable: Governance Index | Static Models | | Dynamic Models | |
|---|---|---|---|---|
| | OLS | Fixed Effects | Dynamic OLS | System GMM |
| *Board_Size* | 0.001 | 0.006 | 0.002 | 0.016 |
| | (0.002) | (0.003) | (0.001) | (0.017) |
| *Independent* | -0.016 | -0.053 | 0.020 | 0.296 |
| | (0.030) | (0.046) | (0.026) | (0.219) |
| *Female* | 0.015 | -0.141* | 0.073* | 0.040 |
| | (0.042) | (0.072) | (0.036) | (0.227) |
| *Old* | -0.043 | -0.032 | -0.017 | 0.096 |
| | (0.027) | (0.041) | (0.021) | (0.108) |
| *Busy* | 0.015 | -0.082 | 0.040 | -0.133 |
| | (0.029) | (0.044) | (0.024) | (0.170) |
| *CEO_Dual* | -0.030*** | -0.007 | -0.014* | 0.077 |
| | (0.007) | (0.010) | (0.006) | (0.050) |
| *Dir_Own* | -0.266*** | -0.234*** | -0.070** | -0.354 |
| | (0.036) | (0.070) | (0.026) | (0.205) |
| *Age* | 0.003 | -0.101*** | 0.015** | 0.068 |
| | (0.005) | (0.030) | (0.005) | (0.044) |
| *MB* | 0.081*** | 0.061*** | 0.038*** | 0.030* |
| | (0.002) | (0.004) | (0.002) | (0.012) |
| *Risk* | -1.638*** | -0.869*** | -1.011*** | -0.547 |
| | (0.107) | (0.115) | (0.113) | (0.867) |
| *Size* | -0.501*** | -0.460*** | -0.191*** | -0.375*** |
| | (0.003) | (0.015) | (0.007) | (0.082) |
| *GI (t-1)* | | | 0.600*** | 0.492* |
| | | | (0.018) | (0.225) |
| *GI (t-2)* | | | 0.033* | -0.038 |
| | | | (0.016) | (0.122) |
| R-squared | 0.925 | 0.882 | 0.958 | |
| AR(1) test (p-value) | | | | (0.048) |
| AR(2) test (p-value) | | | | (0.690) |
| Hansen test of over-identification (p-value) | | | | (0.170) |
| Diff-in Hansen test of exogeneity (p-value) | | | | (0.143) |

## 1.5 Conclusion

This essay introduces a new approach for evaluating firm's corporate governance and the performance of its boards of directors by looking at the outcomes of the board of directors' decisions across different areas rather than considering different board characteristics that have been historically used as measures of good corporate governance. The first step is to define the

firm's most important outcomes that are affected by the board's decision making. For a sample of S&P1500 companies, I employ principal component analysis to construct a governance index representing the overall performance of the boards using the six proxies (sub-indicators) of governance performance identified in step 1. The new governance measure is used next in panel regressions to examine whether is related to different board characteristics recommended in corporate governance best practices. As expected, endogeneity is an important issue that needs to be addressed in empirical studies on corporate governance. The results do not show any significant association between board characteristics and board performance.

Although the sample employed in this study involves mostly publicly listed US companies, it would be interesting if these investigations could also be expanded to firms from other countries, for example in a European context. There are often fundamental differences between Continental European companies and those in the US and UK owing to differences in ownership structure, investor protection, legal requirements, corporate governance structure and practices (Renders, Gaeremynck, & Sercu, 2010, p. 89). For example, when determining corporate governance quality with existing methods, US firms are often categorised as high-quality firms; while, their compliance with good governance practices might have simply occurred with the aim of fulfilling mandatory requirements, as for example those mandated through the Sarbanes-Oxley-Act. On the other hand, European countries mostly possess a voluntary compliance (comply-or-explain) system which could provide them with the opportunity to signal their governance quality (Isakov & Weisskopf, 2014). Therefore, evaluating European firms' corporate governance quality by assessing the level of compliance with the recommendations could be even more challenging. Clearly, their non-compliance with governance recommendations might simply show that the company has chosen a different approach and therefore should not be necessarily interpreted as weak governance. This issue will be investigated in the third chapter of this study.

# Chapter 2

# Corporate Governance, Firm Performance and Stock Market Returns

**Abstract**

This study examines whether firms' corporate governance quality can positively influence their stock returns and operating performance using a newly developed index that accounts for the dynamic nature of internal governance choices. By constructing decile portfolios of firms based on this measure of governance quality, portfolios of firms with better governance quality are shown to outperform firms within the lower governance quality portfolios. Controlling for different risk factors that might affect stock returns, I find that zero-investment strategies that buy HQ portfolios (highest governance quality) and short LQ portfolios (weakest governance quality) generate 3.9% and 3.2% returns for equally- and value-weighted portfolios, respectively, which are statistically significant. Further analyses reveal that governance quality can also explain differences in the value and operating performance of firms.

## 2.1 Introduction

Within the governance structure of a public corporation, management decision (business's day to day operations run by CEOs) is separated from decision control (monitoring CEOs by board of directors), all with the intention of maximising shareholder value (Acharya et al., 2011). Although this structure seems to be reasonable in principle, little is currently known about the performance of corporate governance in practice. The main reason behind this is that

corporate governance arrangements, especially the ones associated with board of directors, are unobservable and as Wessels et al. (2017) describe them are more like a "black box."

Therefore, a major challenge for corporate governance research is to quantify the effects of the decision-making process of the boardroom. The common strategy for tackling this problem is to gather data on observable board structure and characteristics and investigate whether they can explain differences in observable firm outcomes such as operating performance, firm value and stock returns (Schwartz-Ziv & Weisbach, 2013). Empirical results, however, have remained inconclusive and to date, there has been little agreement on the effects of corporate governance on firm value or performance since structures and characteristics have limited time-series variation to enable robust econometric analysis.

The first essay introduced a new approach for evaluating corporate governance quality focusing on different firm outcomes that may be under the influence of board decisions. These outcomes were combined into an index capturing different facets of governance quality using principal components analysis. The aim of the present essay is to examine whether the governance quality of firms, as measured by this index, can explain ex-ante differences in stock returns and operating performance.

To that end, I form equally- and value-weighted portfolios of firms based on the governance index and compare their performance. The results show that portfolios with higher governance quality generally offer higher returns (both raw and risk-adjusted). On average, the equally and value-weighted portfolios with the highest governance quality produce 3.9% and 3.2% higher abnormal returns, respectively, compared to firms in the lowest governance quality portfolios. These results remain consistent for investments made within different holding periods. Using regression analysis this study further investigates the association between governance quality, firm value and operating performance. The findings of these analyses, further, confirm that good governance can indeed lead to better performance measured by *Tobin's Q*, *ROA* (Return on Assets), *NPM* (Net Profit Margin) and *Return* (stock returns).

The remainder of this chapter is organised as follows. Section 2.2 reviews prior research and different theories that have been put forward to explain how governance quality can affect firm performance. Section 2.3 describes the methodology, data and variables used in the empirical analysis. Section 2.4 discusses the findings and the final section concludes the chapter.

## 2.2 Corporate Governance and Firm Performance

From a theoretical perspective, corporate governance practices are designed to mitigate agency conflicts and improve shareholder value. Previous research has identified several channels through which corporate governance can generate positive value for firms. First, good governance can result in higher stock price multiples simply because investors anticipate to receive higher profit in the form of interest or dividends as less cash flow is expected to be diverted away (Ammann, Oesch, & Schmid, 2011). Second, by reducing the perceived risk of a firm and thus monitoring and auditing costs for shareholders, corporate governance can lower the cost of capital and increase firms' access to external finance, which in turn provides greater investment opportunities and higher growth (Pham, Suchard, & Zein, 2012; Shleifer & Vishny, 1997). Corporate governance can also lead to better management and efficient allocation of resource resulting in better operational performance (Claessens & Yurtoglu, 2013).

Moreover, better monitoring can force corporate managers to cut down on unnecessary expenses and perks allowing them to invest more in projects with positive net present values (Renders et al., 2010). Corporate governance can further improve transparency and financial reporting quality, limit earnings manipulation activities and encourage voluntary disclosures, all of which can offer higher investor protection, attract more investors and create firm value. And good governance can improve firms' financial performance which results in more value (Balachandran & Faff, 2015).

Black, Kim, Jang, and Park (2015) consider 'reduced cash flow tunnelling' as an additional channel through which governance can improve performance. Executives may engage in cash flow tunnelling by abusing their related-party transactions (RPTs) in order to transfer resources out of a company to its controlling shareholders. The authors find that although governance does not influence the volume of these transactions, it can moderate the negative effects of related-party transactions on firm value (ibid: p. 132).

Governance quality can also influence firms' payout policy that in turn affects their long-term performance. Caton, Goh, Lee, and Linn (2016) suggest that firms with poor governance can alleviate higher agency conflicts by pre-committing themselves to pass on the company's future earnings to their shareholders in forms of cash dividends. Instead, well-governed firms with inherently lower agency conflicts avoid the associated pre-commitment costs of dividend payouts and enhance value by choosing share repurchase programs. Since the losses associated

with higher agency costs outweigh the gains of financial flexibility, poorly governed firms may be in a disadvantage relative to firms with stronger governance.

Regulatory action may also have an effect on governance quality. Aggarwal, Schloetzer, and Williamson (2016) report that corporate governance regulations in the US, such as provisions under the Sarbanes-Oxley Act of 2002 that strengthen internal controls and disclosure, have had a positive impact on the value of poorly governed firms. They do however recognise that regulations cannot change all aspects of a deeply engrained governance culture noting that the persistence of non-shareholder friendly practices drives the continuing gap between the value of poorly governed and well-governed firms.

Chhaochharia and Grinstein (2007) construct portfolios of firms based on their degree of compliance with governance provisions. By comparing the abnormal return of these portfolios around the rule announcement period, the authors show that firms that are less compliant with these provisions earn positive abnormal returns compared to the more compliant firms. However, further analysis reveals that the governance provisions do not enhance abnormal returns of small firms, which may have to bear larger costs for implementing the rules, and only large firms can actually benefit from the rules. Along the same line, Christensen, Kent, Routledge, and Stewart (2015) report that the adoption of governance recommendations mandated by the Australian Securities Exchange (ASX) does not influence small Australian firms and can only improve the performance and accountability of larger companies (p. 136).

Some authors have attempted to measure governance quality by constructing an index based on perceived governance attributes and empirically examine its influences on firm outcomes. In a prominent study, Gompers et al. (2003) found that a broad index based on 24 equally-weighted governance provisions was negatively correlated with firm value, as measured by Tobin's *Q*, as well as with market returns, sales growth and profits during the decade of the 1990s. Specifically, "an investment strategy that bought firms in the lowest decile of the index (strongest rights) and sold firms in the highest decile of the index (weakest rights) would have earned abnormal returns of 8.5 per cent per year during the sample period" (ibid: p. 107). Similarly, Bebchuk et al. (2009) find a positive association between the quality of corporate governance, firm value and stock returns from 1990 to 2003. They construct the governance index focusing on six of the 24 Investor Responsibility Research Centre (IRRC) provisions used in the Gompers at al. (2003) study. Specifically, they select provisions that set constitutional limits on shareholder voting power (staggered boards, limits to shareholder

amendments of the bylaws, supermajority requirements for mergers, and supermajority requirements) and those in relation to a hostile offer (poison pills and golden parachute arrangements).

Yet a number of empirical studies fail to find an association between governance and firm performance. Johnson et al. (2009) re-examine the findings of the governance studies by Gompers et al. (2003) and Bebchuk et al. (2009) but do not find any significant relationship between governance quality and firms' stock returns once industry differences between firms are taken into account. The authors conclude that the significant abnormal stock returns of well-governed firms are likely to result from asset pricing model misspecification or unanticipated industry performance.

In a follow-up study, Bebchuk et al. (2010) report that although stock returns were positively associated with governance during the 1990s (as documented by Gompers et al. (2003) and Bebchuk et al. (2009)), such relationship did not persist during the subsequent 2000-2008 period. They provide evidence suggesting that the disappearance of the governance-stock returns relation may be due to market participant's gradual awareness of the importance of governance as market prices already reflect the differences between well-governed and poorly governed firms.

Moreover, not all governance provisions affect firm performance to the same extent. Therefore, finding a potential correlation between governance and performance depends on how good governance is defined. Using data provided by Institutional Shareholder Services, Brown and Caylor (2004) create a comprehensive measure of governance containing information on eight corporate governance categories: audit, board of directors, charter/bylaws, director education, executive and director compensation, ownership, progressive practices and state of incorporation. They show that, overall, operating performance, firm value and cash dividend payouts are higher among the well-governed firms. However, the interesting finding of their paper is that among the eight governance categories, provisions related to executive and director compensation have the greatest impact on firm performance in contrast to charter/bylaw provisions that are not highly related to performance. They, therefore, argue that using the Gompers et al. (2003) G-index for examining governance-performance correlation can be misleading as the G-index is mainly constructed based on antitakeover provisions in the charter/bylaws category which have less association with firm performance. Along the same vein, Hermalin and Weisbach (2003) argue that such board characteristics are not important

for business' day-to-day matters and can only be relevant in unique situations that need board's special actions (e.g. financial crisis).

In this regard, several studies use the 2007-2008 Global Financial Crisis (GFC) as a setting for examining the board-performance relationship arguing that financial crisis is an exogenously determined macroeconomic shock where board decisions matter the most. For example, examining a sample of Russian industrial firms during the GFC, Iwasaki (2014) showed that the independence of company boards and auditors can significantly increase the survival probability of these firms. On the other hand, Gupta, Krishnamurti, and Tourani-Rad (2013) using buy-and-hold stock returns of 4046 public firms across 23 countries could not find any evidence that well-governed firms can actually outperform their poorly governed peers. They argue that during the financial crisis firm-specific information cannot be efficiently reflected in stock prices. In a crisis, investors try to safeguard their position by altering their asset allocations towards the less risky assets, which can result in rapid liquidation of stocks irrespective of their governance quality (ibid: p. 87).

Zattoni et al. (2017) link the inconsistencies of empirical findings on governance-performance correlation to the specific national and institutional quality of different countries. More specifically, they show that cross-sectional variations in four main areas of (1) the financial system, (2) education, training and control system, (3) state intervention in the economy and (4) the quality of informal institutions (trust and cultural norms) can amplify or weaken the effects of corporate governance practices on firm performance (p. 630).

A growing body of literature identifies endogeneity as an important source of inconclusive findings on the governance-performance relationship. Studies that explicitly address endogeneity (see Pham, Suchard, & Zein, 2011; Schultz et al., 2010; Wintoki et al., 2012) find no significant relationship between governance and firm performance. Firms may endogenously decide their optimal governance structure based on past performance, for example as a result of the bargaining process between senior management and the board (Hermalin & Weisbach, 2003) or the opportunity cost of outside directors that balances expertise from bringing in more outside directors with loss of interest if there are too many experts on the board (Bozec, Dia, & Bozec, 2010; Harris & Raviv, 2008).

Other sources of endogeneity may also play a role in determining how companies' governance quality may influence their financial performance. First, firms may choose to adopt a governance rule to signal that the managers are behaving well and at the interest of the

shareholders. Although this might affect share prices, interpretations should be made with caution as the price change may simply be due to the signal not the actual standard of firm's governance quality (Black, Jang, & Kim, 2006, p. 367). Omitted variables bias is a further concern in which other economic factors (e.g. firm-level environment) that can predict both governance and performance are unintentionally overlooked. As an example, consider firms with higher growth opportunities that often need to raise more capital to finance their operation. These firms may have more incentives to adopt better governance practices in order to lower their cost of capital. However, the high growth opportunity will probably be reflected in firm value and result in a spurious correlation between governance and firm value (Klapper & Love, 2004, p. 712).

A number of studies attribute the contradictory findings to measurement errors. Governance is often known as a wide-ranging complex concept which is even hard to define, and as there is still not a well-developed theory about what indicators to use, generating reliable and valid measures for governance is quite challenging. According to Larcker et al. (2007), conclusions drawn upon adopting either single measures of governance or governance indexes that simply sum up a set of indicators can be misleading.

## 2.3 Data and Methodology

### 2.3.1 Corporate Governance Index

Single measure of governance (e.g. percentage of independent directors) are believed to be advantageous for having a lower possibility of measurement errors without the need for researchers to decide on how to weight different governance provisions or determine the interaction among them, whether they may be substitutes or complements (Bhagat, Bolton, & Romano, 2008, pp. 1834-1835). These indicators are, however, criticised for naively focusing on only one measure to capture the quality of a multi-dimensional concept like governance (Larcker et al., 2007). The association of such measures with firm performance is also ambiguous. For example, even if we consider a higher percentage of independent directors to be a proxy for good governance quality, there is not sufficient reason to believe that they should necessarily provide efficient monitoring and thus their firms should end up having better performance (Schnyder, 2012).

On the other side of the spectrum are the additive measures constructed by either academics (e.g. *G-index* by Gompers et al. (2003); *E-index* by Bebchuk et al. (2009); *Gov-Score* by Brown and Caylor (2004)) or rating institutions (e.g. ISS Corporate Governance Quotient (CGQ), Governance Metrics International (GMI), and Audit Integrity (AGR)). Although these metrics may provide insights for researchers and investors, omitted variable problems can still exist as some of these indices mainly focus on specific aspects of governance which may limit their scope (Black, De Carvalho, & Gorga, 2012). Moreover, they are generally constructed by giving equal weights to each selected governance attribute without paying much attention to their relative importance, which may be hardly satisfying (Schnyder, 2012).

Other studies explore the governance-performance relation using new perspectives other than compliance with rule-based governance provisions. For a sample of Canadian listed firms, Conheady et al. (2015) quantify board effectiveness using the Board Shareholder Confidence Index (BSCI) data published by the Clarkson Centre for Business Ethics and Board Effectiveness (CCBE). One dimension of this index is devoted to past board practices evaluated as the results of decisions on excessive options grants, CEO pay and performance, directors pensions, options gains disclosed, outstanding loans to directors, and disclosure and CEO succession practices. The other two dimensions involve director independence and stock ownership, boards meeting structure and attendance, implementation of the board's evaluation process and continuing education process. The authors find a positive association between their overall measure of board effectiveness and companies' market value. Moreover, addressing potential endogeneity, they find that among all governance components only board decision outcomes contribute to future firm performance.

Schwartz-Ziv and Weisbach (2013), however, challenge studies that rely on questionnaires or interviews with CEOs and boards regarding their function and contribution to the firm for being unreliable as they can be skewed by directors' memories or willingness for disclosure. The authors further criticise the outcome-based empirical works on board effectiveness for using observable outcomes such as CEO turnover, hostile takeovers or adoption of a poison pill. They argue that these occasions are very rare and do not reflect the day-to-day functions of the board. Drawing upon these arguments, this study directs its attention to the board of directors and their decision outcomes for measuring firm's governance quality. However, instead of looking at the occasional and irregular outcomes, the analysis is based on firm

observable outcomes that, according to prior research, reflect the day-to-day functions of the boards.

This study identifies different firm outcomes that are being affected by board's decisions in six main areas: financial reporting quality, mergers and acquisitions, capital structure, executive compensation, firm financial and non-financial (CSR) performance. It is assumed that firms with more effective boards are expected to: (1) have high-quality financial reporting, (2) use more equity financing, (3) pay higher abnormal return during acquisitions, (4) pay less excessive compensation to their CEOs, have higher (5) financial and (6) non-financial performance. Using a Principal Component Analysis (PCA), these measures are aggregated into a comprehensive governance index.

This approach provides several advantages compared to those adopted in previous studies. Firstly, instead of evaluating the governance quality of firms based on the level of compliance with governance mandated rules, it explores firm outcomes. All we expect from a well-governed firm is to perform well and if we see a firm as having good outcomes, we can surmise that there has been an effective board in action. Further, the use of PCA for constructing the index helps us to abbreviate the most important information hidden in different governance measures into one single variable by finding the linear combination of all variables while retaining the utmost variation possible. This procedure is advantageous for reducing endogeneity issues and measurement errors. As Ammann et al. (2011) argue, "the weighting scheme in PCA-based index is based on a statistical procedure instead of using equal or arbitrarily chosen weights and aims at "optimally" reflecting the underlying dimension or structure of the individual corporate governance attributes" (p. 41).

This chapter uses a sample of S&P 1500 companies for the period of 1992–2015 at a quarterly frequency. This enables us to capture variations of firms' governance quality that might occur within a given year and can provide more insight for portfolio performance analysis which is the main purpose of this study. The final sample comprises 3,086 unique firms with 49,837 firm-quarter observations.[6] The results of the PCA analysis show that the first principal component is a linear combination of all of the original variables with the

[6] Based on the discussion in the previous essay, the following restrictions are applied to the initial dataset: (a) only stocks with share codes 10 and 11 (CRSP share codes for common stock) are selected; (b) for firms with more than one issue of common shares, the ones with longest history and largest market value are chosen; and (c) firms with negative book to market values are excluded from the sample.

component loading signs being as expected. The first principal component is used as the governance index in which a higher value represents better governance quality (i.e. board's effectiveness). The descriptive statistics for the quarterly governance index and its six components can be found in Table V in the Appendix.

### 2.3.2 Corporate Governance and Stock Returns

This study generates portfolios based on the constructed governance index to evaluate whether portfolios of firms that are categorised as having strong governance quality can actually outperform their weakly-governed peers. At the end of each quarter *q*, stocks are ranked on the basis of their governance index (from low to high governance quality). They are, then, allocated into ten decile portfolios where the bottom portfolio (portfolio #1) contains securities with the lowest governance quality and the top decile portfolio (portfolio #10) comprises firms with the highest possible governance quality.

I, then, estimate the average quarterly stock returns of the portfolios using equally weighted (EW) and value-weighted (VW) classifications. Stock returns are measured as CRSP's monthly return variable (*RET*)[7] which converted into quarterly returns by computing the geometric average of the monthly returns within each quarter. Portfolio raw returns (unadjusted for risk) are computed as the weighted average of the quarterly returns of firms in each portfolio. In calculating equally weighted portfolios, all firms within each portfolio are assigned the same weights while firms in value-weighted portfolios are weighted according to their total market capitalisation. While both approaches have pros and cons, equally-weighted portfolios provide higher diversification with more exposure to the small-cap and medium-cap companies. Arguably, by assigning a higher weight to smaller firms that are generally considered riskier and thus have higher expected stock returns we may skew portfolio returns to be higher than normal. Nevertheless, both of these weighting schemes have been widely used in empirical research. This study, further, examines portfolio returns in the context of passive buy-and-hold

[7] The variable *RET* in the CRSP database is defined as "the change in the total value of an investment in a common stock over some period of time per dollar of initial investment."

strategies and calculate Holding Period Returns (HPR) for both equally- and value-weighted portfolios in the spans of 3, 6, 9 and 12 months (i.e. 1st, 2nd, 3rd and 4th quarter).[8]

Riskier companies often have to pay higher returns to compensate for their higher level of risk. According to the well-known Capital Asset Pricing Model (CAPM), a significant portion of portfolio returns can be explained by the market-wide systematic risk. This is the type of risk that is out of the control of the firms and results from different economic factors that affect security markets as a whole (Bodie, Kane, & Marcus, 2005, p. 319). Prior research also identifies other risk factors such as firm size, book-to-market ratio and momentum. First, small firms and those with high book-to-market ratios tend to have higher expected returns than the CAPM prediction (Fama & French, 1993). This might be due to their greater growth opportunities or more volatile business environments that they often experience. Moreover, stock prices show a tendency to continue rising if they have done well in the past year (winners) and continue declining if they have done poorly in the past year (losers), i.e. exhibit momentum (Carhart, 1997).

To account for these risks, portfolio excess returns (i.e. risk-adjusted) are calculated using the Fama-French-Carhart four-factor model (Carhart, 1997; Fama & French, 1993) specified as:

$$Excess\ Return_{it} = \alpha_i + b_i(Mkt_t - R_{ft}) + s_i\, SMB_t + h_i HML_t + m_i MOM_t + e_{it} \quad (2.1)$$

$Excess\ Return_{it}$ measures the quarterly excess return of each portfolio (portfolio return ($R_{it}$) minus risk-free rate ($R_{ft}$)). To capture the systematic risk component of the portfolio return, this model uses a market index to examine how much return each portfolio would pay in excess of the market portfolio return ($Mkt_t$).[9] $SMB_t, HML_t$ and $MOM_t$ are the other risk factors representing returns on Small minus Big (size effect), High minus Low (value effect) and Momentum (winners minus losers), respectively. The intercept $\alpha_{it}$ is the average quarterly

[8] HPRs are for periods after the quarter that firms are allocated to portfolios. For instance, if we assign a firm to be in portfolio #1 on 2000 Q1, 2-quarter HPR will be returns of Q2 and Q3 of 2000.

[9] F-F define the return of the market portfolio as the value-weighted return of all CRSP firms incorporated in the US and have share codes 10 and 11.

expected return after controlling for risk factors, and $e_{it}$ is the error term. Data on *SMB*, *HML* and *MOM* factors are retrieved from Kenneth French's website.[10]

### 2.3.3 Corporate Governance, Firm Value and Operating Performance

From a theoretical point of view, one would expect to find a positive relationship between governance and performance measures. However, as discussed above, empirical findings do not uniformly confirm this association. There is also still no certainty about which performance measure has superiority over the others. Core et al. (2006), for instance, use ROA as their preferred measure of operating performance arguing that it has better distributional properties compare to ROE and is not under the influence of leverage, extraordinary items and other discretionary items (p. 666). Many other studies use Tobin's Q as the key measure of financial performance (e.g. Bebchuk et al. (2010)). Others, on the other hand, criticise this measure for being a cause rather than a consequence of governance (Wintoki et al., 2012) and for reflecting growth opportunities which may arise from exogenous factors such as economic conditions that are out of the control of the management (Bozec et al., 2010). Bozec et al. (2010) further argue that the calculation of Tobin's Q is reliant on the market value of equity for which one should make the assumption that the current value of a firm is truly reflected on share prices. This assumption might be questionable due to the high volatility of stock prices. In this regard, Brown and Caylor (2004) recognise all performance measures as being imprecise indicators of firms' actual performance and emphasise the need for examining several performance measures before drawing a definite conclusion.

This paper uses the following regression model to test whether governance quality can actually lead to better firm performance:

$$Performance\ Measures_{it} = \alpha_{it} + \beta_1 Governance_{it} + \beta_2 Controls_{it} + e_{it} \quad (2.2)$$

As for the performance measure, following prior research, this study uses Tobin's Q (*TQ*) as a proxy for firm value, as well as Return on Assets (*ROA*), Return on Equity (*ROE*) and Net Profit Margin (*NPM*) all representing firm's operating performance. Stock raw return (*Return*) is included as an additional performance measure to capture firm's stock market performance. *TQ* is measured as the ratio of the market value of assets over book value of assets. The market

[10] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

value of assets is calculated as the book value of assets plus the market value of equity[11] less the book value of equity. *ROA*, *ROE* and *NPM* are calculated as the ratios of the firm's total income over total assets, equity capital, and net sales, respectively. *Return* is firm's quarterly stock returns measured using CRSP's return variable (*RET*).

The right-hand side of the equation consists of the explanatory variable, *Governance*, which is measured by the constructed governance index (*Index*). The model further accounts for other firm-specific factors that might affect performance by controlling for firm size (*Size)*, age *(Age)* and market-to-book value (*MB)*. *Size* is the natural logarithm of total assets and *Age* is calculated as the natural logarithm of firms' age in years from the first date the firm appeared in the CRSP database. Finally, *MB* is computed as the natural logarithm of the market value of equity over the book value of equity.

## 2.4 Empirical Results

### 2.4.1 Summary Statistics

Table 2.1 reports the summary statistics of the governance index (*Index*) within each portfolio. As shown in this table, the overall governance index ranges from -4.8 to 4.0. The portfolios are not identical in size in a way that fewer companies are in the two extreme portfolios. Moreover, a large number of firms within the sample belong to portfolios with relatively higher governance quality (portfolios #6 to #9). This is not beyond expectation since this sample mostly involves the largest and most well-known public companies in the U.S.

[11] Market value of equity is computed as the number of shares outstanding multiply closing share price.

**Table 2.1 Summary Value of the Portfolios**

The table reports summary statistics of the portfolios constructed based on the quarterly governance index. At the end of each quarter, firms are ranked based on their governance index (Index) and partitioned into ten portfolios according to their ranking. The higher the value of the Index, the better the governance quality of the firm. Thus, the 10th decile portfolio consists of firms with the highest governance quality, whereas the 1st decile includes firms with the weakest quality of governance.

| Portfolio | Number of Firms | Mean | SD | Min | Max | 25th Percentile | 50th Percentile | 75th Percentile |
|---|---|---|---|---|---|---|---|---|
| 1 | 232 | -1.939 | 1.022 | -4.817 | 1.051 | -2.610 | -2.186 | -1.397 |
| 2 | 321 | -1.133 | 0.922 | -2.942 | 1.093 | -1.771 | -1.412 | -0.452 |
| 3 | 366 | -0.658 | 0.870 | -2.499 | 1.298 | -1.218 | -0.939 | -0.006 |
| 4 | 382 | -0.317 | 0.834 | -1.915 | 1.481 | -0.866 | -0.599 | 0.365 |
| 5 | 393 | -0.051 | 0.807 | -1.749 | 1.905 | -0.603 | -0.324 | 0.633 |
| 6 | 473 | 0.213 | 0.798 | -1.234 | 2.105 | -0.341 | -0.054 | 0.936 |
| 7 | 443 | 0.479 | 0.786 | -1.063 | 2.375 | -0.029 | 0.219 | 1.185 |
| 8 | 421 | 0.764 | 0.771 | -0.841 | 2.485 | 0.251 | 0.513 | 1.506 |
| 9 | 411 | 1.103 | 0.786 | -0.498 | 2.911 | 0.566 | 0.883 | 1.898 |
| 10 | 341 | 1.699 | 0.837 | -0.092 | 4.040 | 1.114 | 1.461 | 2.418 |

I further compare the two extreme portfolios (portfolio #1 with the lowest governance quality and portfolio #10 with the highest governance quality) in terms of financial measures, firm and board characteristics. According to Panel A of Table 2.2, firm size is negatively associated with the governance measure indicating that governance is more effective for smaller firms. On the other hand, by comparing the mean values of the market-to-book value (*MB*), operating performance (measured as *ROA*) and stock returns (*Return)* between HQ and LQ governance portfolios, one can realise that well-governed firms have higher market value and experience better performance. These findings are consistent with Gompers et al. (2003) who find that firms in their "democracy portfolio" (high governance quality or high shareholder rights) are smaller with relatively higher stock market performance compared to what they call the "dictatorship portfolio" which includes firms with low governance quality or weak shareholder rights (p. 120).

Panel B of Table 2.2 shows that firms in HQ governance portfolio have smaller boards with fewer independent and fewer female directors serving on the board compared to the LQ governance portfolio. This seems to be in line with the view that smaller boards are more efficient because of their lower costs of coordination and social loafing problems (Coles et al., 2008). It also supports Byrd and Hickman's (1992) argument that inside directors tend to be more valuable for firms because of their better insights into the day-to-day operation of the business.

**Table 2.2 Summary Statistics of Financial Measures and Board Structure within Portfolios**

Panel A reports correlations between the governance index (G) and firm financial measures and descriptive statistics of these measures within the first (Low-quality (LQ) Governance) and last (High-quality (HQ) Governance) portfolios. The last column reports the difference between the two means and their significance. *Size* and *MB* are the natural logarithms of total assets and the market value of equity over book value of equity, respectively. *ROA* is the firm's net income divided by its total assets and *Return* is the firm's quarterly stock return. Panel B reports the mean values of variables related to board structure. *Board_Size* represents the total number of board members. *Independent* is the fraction of outside directors. *Female* is the fraction of female directors. *Old* represents the fraction of directors who are older than 70 years old. *Busy* is the fraction of directors that hold three or more directorship appointments at different publicly traded firms. *CEO_Dual* is a dummy variable that equal to 1 if CEO is also the chairman; and zero otherwise. Finally, *Dir_Own* is the proportion of shares outstanding owned by the directors. ** and *** indicate the significance of the difference between the two means at 5 and 1 per cent, respectively.

| **Panel A: Governance and Financial Measures** | | | | |
|---|---|---|---|---|
| | Correlation with G | Mean HQ Governance | Mean, LQ Governance | Difference |
| *Size* | -0.785*** | 5.692 | 10.221 | -4.528*** |
| *MB* | 0.261*** | 4.142 | 2.088 | 2.054*** |
| *ROA* | 0.280*** | 0.036 | 0.020 | 0.016*** |
| *Return* | 0.076*** | 0.021 | 0.088 | 0.067*** |
| **Panel B: Governance and Board Characteristics** | | | | |
| | Correlation with G | Mean, HQ Governance | Mean, LQ Governance | Difference |
| *Board_Size* | -0.385*** | 7.532 | 11.847 | -4.315*** |
| *Independent* | -0.508*** | 5. 451 | 9.053 | -3.602*** |
| *Female* | -0.421*** | 0.517 | 1.710 | -1.193** |
| *Old* | -0.120*** | 0.117 | 0.117 | 0.000 |
| *Busy* | -0.119*** | 0.053 | 0.135 | -0.082*** |
| *CEO_Dual* | -0.064*** | 0.509 | 0.826 | -0.317*** |
| *Dir_Own* | 0.103*** | 0.083 | 0.039 | 0.043*** |

Panel B also shows that in the HQ governance portfolio only 5.3% of the directors are busy with three or more directorships at different publicly traded firms, while 13.5% of the directors in LQ governance firms are classified as busy directors. Further, within the HQ governance portfolio, fewer CEOs (50%) hold dual CEO/chairman roles compared to LQ governance portfolio where 82.6% of the CEOs serve as board chair, as well. Finally, HQ governance portfolio directors own a relatively greater proportion of their company's share capital. This might be because a higher level of equity ownership can provide board members with more voting power and improved incentives towards value maximisation (Morck et al., 1988, p. 294).

However, one should be careful drawing firm conclusions on the directional impacts of firm characteristics and board characteristics on governance quality simply by looking at these

characteristics in different portfolios. Firm size, for instance, has also been suggested to positively affect governance quality because small firms may face constraints on the amount of resources they could spend to comply with corporate governance best practices (Branco & Rodrigues, 2008). One may also argue that there might be an inverse U-shaped relationship between firm size and corporate governance quality. Therefore, a more in-depth investigation would be required to establish how governance quality can be influenced by different firm-specific factors.

### 2.4.2 Portfolio Return

Table 2.3 reports the average quarterly stock raw (i.e. unadjusted for risk) returns of equally weighted and value-weighted portfolios. The results show that, on average, firms in portfolios with lower governance quality underperform the firms in portfolios with a relatively higher quality of governance. The average raw returns of the equally and value-weighted portfolios seem to be increasing as we move towards the portfolios with the higher governance quality, such that the HQ portfolio (portfolio #10) provides statistically significant higher returns (4.4% in EW and 4.5% in VW settings) compare to the LQ portfolio (portfolio #1).

**Table 2.3 EW and VW Portfolios Raw (Risk-unadjusted) Returns**

This table presents the average quarterly returns of the equally and value-weighted portfolios constructed based on the governance index (*Index*). The first portfolio includes firms with the lowest governance quality (LQ). In contrast, the 10$^{th}$ decile portfolio involves firms with the highest quality of governance (HQ). Returns are raw and do not account for any types of risks. SD is the standard deviation of the portfolios. Sharpe ratio for each portfolio is calculated as (Mean Return- risk-free rate)/SD. ** indicates the significance of the difference between two means at 5 per cent.

| | Equally weighted | | | Value-weighted | | |
|---|---|---|---|---|---|---|
| Portfolio | Mean Return (Risk-unadjusted) | SD | Sharpe Ratio | Mean Return (Risk-unadjusted) | SD | Sharpe Ratio |
| 1 (LQ) | 0.005 | 0.116 | 0.017 | 0.020 | 0.103 | 0.126 |
| 2 | 0.006 | 0.105 | 0.010 | 0.027 | 0.094 | 0.213 |
| 3 | 0.015 | 0.108 | 0.074 | 0.021 | 0.104 | 0.135 |
| 4 | 0.025 | 0.126 | 0.143 | 0.042 | 0.116 | 0.302 |
| 5 | 0.022 | 0.113 | 0.133 | 0.037 | 0.129 | 0.233 |
| 6 | 0.026 | 0.106 | 0.179 | 0.037 | 0.102 | 0.294 |
| 7 | 0.027 | 0.122 | 0.164 | 0.030 | 0.145 | 0.159 |
| 8 | 0.033 | 0.117 | 0.222 | 0.040 | 0.117 | 0.282 |
| 9 | 0.036 | 0.133 | 0.218 | 0.052 | 0.149 | 0.302 |
| 10 (HQ) | 0.049 | 0.150 | 0.280 | 0.065 | 0.166 | 0.349 |
| (HQ)-(LQ) | 0.044** | | | 0.045** | | |

The higher governance quality portfolios also have higher standard deviation which may account for a larger share of smaller firms. To account for portfolio risk, this table also reports the portfolio's Sharpe ratio, also known as the reward-to-volatility ratio. This ratio measures the excess return of the portfolios per one unit of additional standard deviation calculated as the difference between each portfolio's average return and the risk-free rate, all divided by its standard deviation (Bodie et al., 2005). The results confirm that the firms in the portfolios classified as having higher governance quality pay higher returns.

I, next, calculate Buy-and-Hold returns of EW and VW portfolios for the periods of 1, 2, 3 and 4 quarters. The aim is to understand how much return these portfolios would generate if an investor chooses a passive investment strategy in which he/she would just buy portfolios, hold it for a specific amount of time and then sell it. The holding period returns are calculated for one quarter ahead of the time used to group the firms into portfolios.

**Table 2.4 EW and VW Portfolio Buy-and-Hold Returns**

This table presents the average portfolios buy-and-hold return and their standard deviation (SD). The first portfolio includes the firms with the lowest governance quality (LQ) while the 10$^{th}$ decile portfolio involves firms with the highest quality of governance (HQ). The returns are raw returns, before accounting for any types of risks. SD is the standard deviation of the portfolios. Sharpe ratio for each portfolio is calculated as (Mean Return- risk-free rate)/SD. ** and *** indicate the significance of the difference between two means at 5 and 1 per cent, respectively.

| | | Equally weighted | | | Value-weighted | | |
|---|---|---|---|---|---|---|---|
| Holding Period (Quarter) | Portfolio | Mean Return | SD | Sharpe Ratio | Mean Return | SD | Sharpe Ratio |
| 1 | LQ | 0.005 | 0.116 | -0.017 | 0.021 | 0.104 | 0.135 |
| 1 | HQ | 0.051 | 0.150 | 0.293 | 0.067 | 0.166 | 0.361 |
| 1 | HQ-LQ | 0.045** | 0.034 | 0.311 | 0.046** | 0.062 | 0.227 |
| 2 | LQ | 0.017 | 0.170 | 0.059 | 0.041 | 0.151 | 0.225 |
| 2 | HQ | 0.109 | 0.223 | 0.457 | 0.148 | 0.278 | 0.507 |
| 2 | HQ-LQ | 0.093*** | 0.053 | 0.399 | 0.107*** | 0.127 | 0.282 |
| 3 | LQ | 0.020 | 0.222 | 0.059 | 0.063 | 0.191 | 0.293 |
| 3 | HQ | 0.168 | 0.290 | 0.555 | 0.237 | 0.401 | 0.574 |
| 3 | HQ-LQ | 0.148*** | 0.068 | 0.497 | 0.174*** | 0.210 | 0.280 |
| 4 | LQ | 0.026 | 0.264 | 0.072 | 0.083 | 0.222 | 0.342 |
| 4 | HQ | 0.225 | 0.352 | 0.619 | 0.329 | 0.545 | 0.591 |
| 4 | HQ-LQ | 0.199*** | 0.088 | 0.547 | 0.246*** | 0.323 | 0.248 |

The results in table 2.4 show that within all holding periods, the HQ portfolios outperform LQ governance portfolios. The largest difference in portfolio returns belongs to 4-quarters VW portfolios where the portfolio of firms with the highest governance quality provides 24.6%

higher return compared to the low governance quality portfolio. Moreover, within all holding periods, the higher decile portfolios have higher reward-to-volatility ratios compare to portfolios in the lower deciles which further confirms that HQ portfolios pay higher returns for an additional unit of risk.

Comparing the mean return of portfolios are, however, only suggestive of a possible relationship between governance and returns and as discussed earlier, different firm and market risk factors might involve in explaining abnormal returns. I account for these risk factors and calculate risk-adjusted returns using the Fama-French-Carhart four-factor model specified in equation 2.1. The four risk factors include market risk $(Mkt_t - R_{ft})$, size $(SMB_t)$, value $(HML_t)$, and momentum $(MOM_t)$. Table 2.5 provides the regression results of equation 2.1 for EW and VW decile portfolios. The intercept (α) represents portfolio return in excess of the return that might be offered to investors to compensate for the risk. By regressing portfolio returns over $Mkt_t - R_{ft}$, $SMB_t, HML_t$ and $MOM_t$, returns can be adjusted for common risk factors in stock returns. I also calculate the return of a zero-investment strategy that buys HQ portfolio and sells the LQ portfolio (HQ-LQ). Here, the dependent variable in the four-factor model would be the return difference between the HQ and LQ portfolios.

**Table 2.5 Regression results of equation 2.1**

This table reports the regression results of equation 2.1 for EW (Panel A) and VW (Panel B) portfolios. The intercept ($\alpha$) is the risk-adjusted return. *b*, *s*, *h* and *m* are regression coefficients for the relevant risk-factors $Mkt_t - R_f$, $SMB$, $HML$, and $MOM$. Standard errors are reported in parentheses and *, ** and *** indicate significance at 10, 5 and 1 per cent, respectively.

| Portfolio | $\alpha_i$ (Risk-adjusted Return) | $b_i$ $(Mkt_t - R_{ft})$ | $s_i$ $(SMB_t)$ | $h_i$ $(HML_t)$ | $m_i$ $(MOM_t)$ |
|---|---|---|---|---|---|
| **Panel A: Equally weighted Portfolios** | | | | | |
| 1 (LQ) | -0.029*** | 1.098*** | 0.189 | 0.488*** | -0.041 |
| | (0.008) | (0.094) | (0.158) | (0.116) | (0.088) |
| 2 | -0.025*** | 0.969*** | 0.173 | 0.555*** | -0.098 |
| | (0.007) | (0.081) | (0.136) | (0.100) | (0.076) |
| 3 | -0.016** | 1.000*** | 0.250* | 0.392*** | -0.044 |
| | (0.007) | (0.089) | (0.149) | (0.109) | (0.083) |
| 4 | -0.005 | 0.962*** | 0.448** | 0.468*** | -0.194* |
| | (0.009) | (0.116) | (0.194) | (0.143) | (0.108) |
| 5 | -0.009 | 1.026*** | 0.418*** | 0.165 | -0.030 |
| | (0.007) | (0.091) | (0.152) | (0.112) | (0.085) |
| 6 | 0.005 | 0.639*** | 0.647*** | 0.286** | -0.300*** |
| | (0.008) | (0.097) | (0.164) | (0.120) | (0.091) |
| 7 | -0.009 | 1.243*** | 0.539*** | 0.110 | 0.048 |

| | | | | | |
|---|---|---|---|---|---|
| | (0.006) | (0.071) | (0.119) | (0.087) | (0.066) |
| 8 | -0.0003 | 0.990*** | 0.645*** | 0.342*** | -0.018 |
| | (0.008) | (0.097) | (0.163) | (0.104) | (0.090) |
| 9 | 0.009 | 1.057*** | 0.623*** | -0.009 | -0.188* |
| | (0.009) | (0.112) | (0.188) | (0.138) | (0.105) |
| 10 (HQ) | 0.016 | 1.102*** | 1.228*** | -0.271* | 0.115 |
| | (0.009) | (0.116) | (0.195) | (0.143) | (0.114) |
| **HQ-LQ** | 0.039*** | -0.0003 | 1.053*** | -0.775*** | 0.142*** |
| | (0.004) | (0.048) | (0.080) | (0.059) | (0.044) |
| **Panel B: Value-weighted Portfolios** | | | | | |
| 1 (LQ) | -0.007 | 1.000*** | -0.129 | 0.144 | -0.050 |
| | (0.007) | (0.091) | (0.153) | (0.113) | (0.085) |
| 2 | 0.002 | 0.813*** | -0.048 | 0.256** | 0.007 |
| | (0.008) | (0.096) | (0.161) | (0.118) | (0.090) |
| 3 | -0.007 | 0.969*** | -0.194 | 0.295** | 0.016 |
| | (0.008) | (0.100) | (0.167) | (0.123) | (0.093) |
| 4 | 0.019* | 0.834*** | 0.172 | 0.044 | -0.093 |
| | (0.010) | (0.126) | (0.212) | (0.156) | (0.118) |
| 5 | 0.009 | 1.134*** | -0.028 | -0.327** | 0.165 |
| | (0.010) | (0.121) | (0.203) | (0.149) | (0.113) |
| 6 | 0.018** | 0.658*** | 0.107 | 0.166 | -0.232** |
| | (0.009) | (0.112) | (0.189) | (0.139) | (0.105) |
| 7 | -0.009 | 1.394*** | 0.098 | -0.068 | 0.355*** |
| | (0.010) | (0.129) | (0.217) | (0.159) | (0.121) |
| 8 | 0.011 | 0.995*** | 0.334* | 0.061 | 0.051 |
| | (0.009) | (0.111) | (0.186) | (0.137) | (0.103) |
| 9 | 0.025* | 1.048*** | 0.505* | -0.391** | 0.110 |
| | (0.012) | (0.154) | (0.258) | (0.189) | (0.143) |
| 10 (HQ) | 0.032*** | 1.133*** | 1.244*** | -0.436** | 0.161 |
| | (0.012) | (0.143) | (0.240) | (0.176) | (0.133) |
| **HQ-LQ** | 0.032*** | 0.127** | 1.389*** | -0.595*** | 0.197*** |
| | (0.005) | (0.057) | (0.096) | (0.070) | (0.053) |

According to the results presented in Table 2.5, risk-adjusted returns seem to be higher in the portfolio of firms with better governance quality in a way that zero-investment strategies provide 3.9% and 3.2% statistically significant higher return in EW portfolios and VW portfolios, respectively. This confirms that even after controlling for common risk factors, firms with better governance quality still enjoy better stock performance. One might argue that this contrasts with the common expectation that lowest governance quality firms should provide higher returns to compensate their investors for a higher level of risk or higher cost of capital. This argument would be relevant for ex-ante portfolio returns. However, it does not

affect our findings mainly because the reported results are based on the ex-post portfolio performance where the market appears to reward well-governed firms with higher stock prices.

The market risk slopes ($b_i$) of EW and VW portfolios are close to 1 and mostly significant which indicates that the portfolio returns move in accordance with the market. The coefficients on $SMB_t$ and $HML_t$ are mainly positive and significant especially in EW portfolios. This shows that the portfolios are generally inclined towards small and high-value growth companies. Contrary to our expectation, although only significant within a few portfolios, the coefficients of the momentum factor ($MOM_t$) are generally negative demonstrating that the portfolios are skewed towards the securities that have been trending downwards (instead of upwards) in the recent past. A possible explanation can be the negative association between value and momentum measures presented by Asness (1997). He argues that although value and momentum strategies can be both effective, they are negatively correlated and thus "pursuing a value strategy entails, to some extent, buying firms with poor momentum" and vice versa (p. 34).

### 2.4.3 Governance and Performance

We now turn to investigate how governance quality of firms can influence their performance. Doing so, I run model 2.2 for five different measures of performance (the dependent variable) including *Tobin's Q*, Return on Assets (*ROA*), Return on Equity (*ROE*), Net Profit Margin (*NPM*) and stock market returns (*Return*). The main independent variable is firm's governance quality, which is measured by the constructed governance index (*Index*). To account for other factors that might affect performance, firm's size (*Size),* age *(Age)* and market-to-book value (*MB)* are included as control variables. Apart from Ordinary Least Square (OLS), the regressions are estimated with fixed effects specifications and industry-adjusted performance measures to ensure that the results are not driven by firm or industry difference among the firms. Year dummies are also included in all regressions to account for time fixed effects. The results of these regressions are presented in Table 2.6.

As can be seen from the table, apart from *ROE*, all performance measures are positively associated with governance quality of firms and the effect in each case is statistically significant. More specifically, the results show that after controlling for firm, industry and time fixed effects, any one unit increase in firm's governance quality can increase *Tobin's Q, ROA,*

*NPM* and *Return* by 0.682, 0.554, 0.035 and 0.110 units, respectively. These findings are consistent with theories that give central importance to governance when it comes to performance improvements. They are also consistent with those of Bhagat and Bolton (2019) who also found empirical evidence linking ROA, stock returns and Tobin's Q to corporate governance quality.

**Table 2.6 Governance Quality and Performance**

This table reports the results of model 2.2 regressions where five measures of performance (*Tobin's Q*, Return on Assets (*ROA*), Return on Equity (*ROE*), Net Profit Margin (*NPM*) and stock market return (*Return*)) is regressed on the governance quality of firms (*Index*). *Tobin's Q* is defined as the ratio of the market value of assets over the book value of assets. The market value of assets is calculated as the book value of assets plus the market value of equity less the book value of equity. *ROA, ROE* and *NPM* are calculated as the ratios of firm's total income over total assets, equity capital, and net sales, respectively. *Return* is measured as CRSP's monthly return variable (RET) which are converted into quarterly returns by getting a geometric average of the monthly returns within each quarter. I also control for firm size (*Size)*, age *(Age)* and market-to-book value (*MB)* in all regressions although the coefficients are not reported in this table. The regressions are estimated for actual and industry-adjusted values of the performance measures. The industry adjustments are made by subtracting the industry median of each measure (within the corresponding Fama-French 48 industries) from its actual value. Year dummies are also included in all regressions. Standard errors are reported in parentheses and *, ** and *** indicate significance at 10, 5 and 1 per cent, respectively.

| | | Dependent Variables | | | | |
|---|---|---|---|---|---|---|
| | | Tobin's Q | ROE | ROA | NPM | Return |
| **OLS** | Actual | 1.032*** (0.107) | -0.017*** (0.002) | 0.483*** (-0.019) | 0.035*** (0.003) | 0.035*** (0.005) |
| | Industry-adjusted | 0.618*** (0.103) | -0.009*** (0.002) | 0.270*** (-0.02) | 0.041*** (0.002) | 0.033*** (0.005) |
| **Fixed Effects** | Actual | 0.802*** (0.085) | -0.002 (0.003) | 0.646*** (0.039) | 0.043*** (0.004) | 0.117*** (0.011) |
| | Industry-adjusted | 0.682*** (0.08) | -0.004 (0.004) | 0.554*** (0.038) | 0.035*** (0.004) | 0.110*** (0.011) |

Contrary to my expectation, the coefficient of *Index* becomes negative when performance is measured by *ROE* although it is only significant in the OLS regression. This inconsistency may be due to endogeneity. As the fixed effects regression shows, once I account for unobservable firm differences no significant association between *ROE* and governance is found. Another potential reason may involve the way the governance index was constructed. In particular, firms with a higher ratio of equity capital (as opposed to debt) are considered as firms with high quality of corporate governance.

Clearly, the higher values of equity can result in a lower *ROE* ratio since *ROE* is calculated by dividing firm's total return over its equity capital. Therefore, high quality governed firms may have lower levels of *ROE* not necessarily because they have lower returns but because they tend to have higher equity in their capital structure. Taken together, the results seem to support the notion that good governance positively affects firms' operating performance and stock market returns.

## 2.5 Conclusion

This study sets out to investigate whether corporate governance quality, as measured by the constructed governance index, can bring about higher market value, operating performance and stock market returns. To do so, this chapter first constructs decile portfolios based on a governance index which explicitly accounts for the dynamic nature of internal governance choices. Comparing the returns of the portfolios in the highest decile (portfolio #10 with the highest governance quality (HQ)) with those in the lowest decile (portfolio#1 with the lowest governance quality (LQ)), I find that firms with higher governance quality generally outperform their peers which possess a lower quality of governance.

Even after controlling for different risk factors that might affect stock returns using the Fama-French-Carhart four-factor model, the results show that zero-investment strategies that buy HQ portfolio and short LQ portfolio generate 3.9% and 3.2% statistically significant higher returns for EW and VW portfolios, respectively. Further analysis shows that governance quality can also explain differences in the value and operating performance of firms.

The empirical findings in this study provide further insights into understanding the role of corporate governance on firm performance. Although theory offers several channels through which governance is expected to benefit firms, empirical work faces challenges. This study suggests that conflicting findings of prior research on the governance-performance relation may be linked to how we define and measure governance. By focusing on firm outcomes rather than board structure and characteristics, which may be endogenous, I find evidence linking governance quality to firm performance. However, I do recognise that further research needs to be undertaken to corroborate these findings across different markets.

# Chapter 3

# Quality of Boards Decision, Corporate Governance and Firm Performance: A Study of European Firms

**Abstract**

Most corporate governance research focusses on prescriptive measures of governance quality (e.g., board composition, attributes) and their association with measures of firm performance but neglects the dynamic nature of governance choices that impinge on firm value. This study constructs a dynamic governance quality index for a sample of public companies from 16 European countries. Comparing the returns of the portfolios structured based on this index reveals that European companies with higher governance quality (HQ portfolio) generally outperform their peers which possess a lower quality of governance (LQ portfolio). The findings also show that firm-level governance can be affected by country-level elements such as legal and institutional setups. A zero-investment strategy that buys value-weighted HQ portfolio and shorts LQ portfolio generates 4.6% statistically significant higher returns in firms operating in common law countries; while a similar strategy only generates 1.8% higher returns in civil law countries.

## 3.1 Introduction

For many years, corporate governance practices have emerged as powerful platforms for managing the conflict of interest between corporate managers and their shareholders, aiming at improving firms' performance and maximising shareholders' wealth. Most research to date,

however, has tended to focus on Anglo-American companies and although evidence from many of these studies suggests that corporate governance attributes (e.g., managerial incentives, strength of shareholder rights) have been successful in delivering what they promise (e.g. Bebchuk et al., 2009; Gompers et al., 2003), others have not reached such conclusions (e.g. Johnson et al., 2009).

Recent developments in global capital markets have led to renewed interest in valuing European corporate governance systems, embedding the contrasting features of the Anglo-American governance model (Ireland, UK) vis-a-vis those of Continental European. Most empirical research within this area seems to confirm that these governance models do not generate the expected outcomes in all countries. Continental European companies, for instance, have been known to face different governance challenges than those of the US or UK firms due to inherent differences in their countries' legal origin, shareholders protection, law enforcement and ownership structures. The consensus view is that "one size does not fit all" and European governance mechanisms need to be tailored in accordance with their innate characteristics (Aguilera et al., 2015).

Most researchers investigating European corporate governance systems have followed the common practice of evaluating firms' governance quality, which is to identify how well companies' governance arrangements are tied up with corporate governance codes of best practice (e.g. Belot et al., 2014; Renders & Gaeremynck, 2012). As discussed in the first two essays, existing corporate governance measures neglect the realm of dynamic governance choices that impinge on firm value. More specifically, corporate governance is typically portrayed to resemble a "black box" in the sense that most governance actions shaping firm performance are unobservable to outsiders.

When determining governance quality using existing methods firms are often categorised as high-quality governed firms by simply complying with stylistic best practice requirements, such as for example IRCC (Investor Responsibility Research Centre) provisions (see Bebchuk et al., 2009). The issue can be even more problematic when examining European companies' governance practices. This is because European countries mostly possess a voluntary compliance system where firms follow a "comply-or-explain" approach. This gives them more flexibility in terms of which governance provision to comply with based on what is actually beneficial for their companies. Therefore, firms' non-compliance cannot necessarily be interpreted as poor governance (Aguilera & Crespi-Cladera, 2016).

The present essay follows a similar approach to that developed in the first two essays to evaluate the corporate governance quality of firms within the European context. I focus on the board of directors as the main governing body of the corporation and construct a governance index by looking at different firm outcomes being affected by board's decisions. The index is, then, employed to assess the firm's stock market returns and operating performance. In the next section, I draw upon prior empirical research to describe how differences in countries institutional and legal systems can influence their firms' governance quality and thus, the governance-performance relation analysis. In this sense, this study goes beyond internal governance mechanisms to examine the role of external governance mechanisms, and in particular, the legal environment plays in shaping good overall governance. Section 3.3 and 3.4 describe the method and empirical findings and section 3.5 concludes the essay.

## 3.2 Corporate Governance in European Countries

Previous literature has highlighted several cross-country differences that need to be addressed when studying corporate governance. At the most basic level, even the "corporate" concept is not the same within different traditions. As Cernat (2004) argues, a corporation in the Anglo-American tradition is based on a fiduciary relationship between the managers and shareholders built on self-interest and market capitalism which is performing effectively when combined with appropriate institutions. In the Continental European tradition, on the other hand, a company may have an independent will from its shareholders in a way that "what is good for the corporation might not necessarily be good for the shareholders" (p.150).

The majority of studies in the European context seem to reach the conclusion that similar to the US companies, governance is indeed essential for European firms, although its tasks and functionalities vary because of several major differences at the company and country (i.e. institutional) levels (Aguilera & Crespi-Cladera, 2016; Belot et al., 2014).

### 3.2.1 Ownership Structure

According to La Porta, Lopez-de-Silanes, and Shleifer (1999), dispersed ownership is not very common when we look at the ownership structure of the companies outside of the US. Apart from the UK, in most European countries a dominant shareholder, an individual or a family, controls the majority of votes in a typical company. These controlling shareholders do not generally own major cash flow rights but often exercise their control through pyramid

ownership and multiple class shares (ibid: p. 473). Within the pyramid ownership structure, the shareholders indirectly exercise their power through their ownership in another company. In other words, in a pyramid, a wealthy individual or family owns the majority of voting rights of a company which, itself, is the major shareholder of another listed company, providing the wealthy individual or family with control rights on the second company (Enriques & Volpin, 2007).

Contrary to the Anglo-American systems where firms mostly rely on financial markets to raise capital, most European firms funding comes from major (individuals or family) shareholders, corporations and financial institutions (e.g. Cernat, 2004; Krivogorsky, 2006). According to Cernat (2004), while financial institutions mostly act as an agent on behalf of dispersed shareholders in the US, in continental Europe it is quite common for them to own significant proportions of shares in companies they provide credit for. This also provides the banks with the opportunity to impose some form of control over their clients' financial activities.

The concentrated ownership structure is claimed to mitigate the traditional principal-agent conflict which has long been the foundation of most corporate governance debate. As the manager and the controlling shareholder are often the same person, family-controlled firms have been thought to better protect the shareholders' interest against managerial exploitations. In other words and according to Enriques and Volpin (2007), " the dominant shareholders have both the incentive and the power to discipline the management" (p. 117). The controlling owner is, also, more likely to put greater effort and commit more human capital towards the firm's long-term value maximisation goal (Bertrand & Schoar, 2006). Moreover, many large European corporations have been performing well under the control of a founding family for many years. This can bring about the perception that family owners are valuable for their companies' success (Barontini & Caprio, 2006).

However, the concentrated ownership structure has been claimed to engender another type of agency problem known as a principal-principal conflict, where the controlling shareholder has both the interest and the power to gain private benefit by expropriating minority shareholders (La Porta et al., 1999). Barontini and Caprio (2006) argue that major shareholders such as families in family-owned corporations would have different priorities than their outside shareholders. For instance, they would probably be willing to maintain the control of their

companies within the family and thus, assign the executive positions, which often come with high remuneration, to their family members (p. 690).

A pyramidal structure may also provide the controlling shareholder with the opportunity to tunnel or self-transfer corporate resources and value from firms in which they own a small portion of cash-flow rights to firms where they own a larger share of cash flow rights. Another issue is that unlike the US where an active market for corporate control works as an efficient disciplinary tool for managerial discretion, the controlling shareholder is harder to be forced out in hostile takeovers, by board of directors or in shareholders' meetings (Enriques & Volpin, 2007, p. 122).

The empirical evidence regarding the influence of ownership structure on corporate governance structure and performance of European firms is rather inconclusive. For a sample of companies from 11 Western European countries, Barontini and Caprio (2006) show that although there is a high level of disparity between cash flow and voting rights within family-controlled firms, these firms often enjoy a significantly higher value and better operating performance as measured by Tobin's Q and ROA. Bennedsen and Nielsen (2010), on the contrary, examine the disproportional ownership structures of near 4000 Western European firms and find large and significant value discounts in family firms and in firms with low cash flow concentration. They, further, show that within the ownership separating mechanisms, dual class shares are associated with higher value destructions compared to pyramidal structures (p. 2213).

### 3.2.2 Board Structure (Single vs. Dual)

The nature of corporate governance conflicts (i.e. principal-principal) along with the unique institutional and ownership characteristics of European companies means that their boards of directors, as the main internal disciplining mechanism, would have different tasks and objectives than those of the US and UK boards. This has ultimately led European companies' boards to emerge with a structure that probably fits better with their purposes. While in the Anglo-American context, boards are mainly responsible for overseeing the management and safeguarding the interest of the dispersed shareholders, in Continental Europe the boards are designed to control the influence of the majority shareholder (Dehaene, De Vuyst, & Ooghe, 2001).

Most European boards are arranged with a two-tiered (dual) structure consisting of two separate board of directors; a management board charged with deciding the strategic direction of the company, managing the firm's operations, and implementing decisions; plus a supervisory board being responsible for monitoring firm's activities as well as appointing and supervising the management board. The supervisory board under a two-tier structure includes exclusively non-executive directors representing dominant shareholders, employees, governments and banks (Belot et al., 2014, p. 364).

Although it has been argued that the strong independence of the supervisory board under a dual structure could provide greater monitoring intensity for protecting shareholders' interests, dual boards are often criticised for their higher costs of functioning and for certain deficiencies caused by poor information flows between management and supervisory boards, and the risk of being dominated by directors serving majority shareholders interests (Aras & Crowther, 2012).

Adams and Ferreira (2007) distinguish between the advising and monitoring responsibilities of boards concluding "that policies that enhance board independence may be detrimental for shareholders in a sole board system, but not for shareholders in a dual board system." Managers may not be willing to share information with a sole independent board when its monitoring intensifies. This, in turn, implies that the board will not be able to monitor as effectively, and shareholder value may decrease. This problem does not arise under a dual board system since managers have no incentives to limit information sharing. In the same vein, Belot et al. (2014) argue that the structure of the board generally reflects the characteristics of their firm and its environment. Using a sample of the largest French firms that have been given the freedom of choice between unitary or two-tier board structures, they show that firms with severe information asymmetries are more likely to choose a unitary board structure as in these firms a friendly board can improve information sharing and thus, enhance value. On the other hand, firms with greater opportunities of private gains are more likely to opt for a two-tiered structure as two-tiered boards are more efficient when it comes to monitoring and disciplining management (p. 364).

However, empirical corporate finance research attempting to analyse the causes and effects of board structure on firm performance has failed to favour one structure over the other. Some studies associate observed superior performance to board composition factors such as board size, directors' independence and insiders share ownership, whereas others emphasise firm-

specific characteristics such as the size of the company, the number of block holders and industry performance (e.g. Dehaene et al., 2001; Krivogorsky, 2006).

### 3.2.3 Legal Origin, Law Enforcement and Shareholder Protection

It is now well established that firm-level and country-level governance are closely connected. Yet, there is little agreement on whether there is a conflicting or complementary relationship between the two. The logic behind the complementary relationship argument is that in countries with weak institutional quality, firm-level governance is and would remain fragile. This is because firms would find it too expensive to commit themselves to better governance when there is no guarantee for shareholder protection. On the other side of the argument, companies are believed to be bound to develop alternative methods to enhance investors' protection in order to maintain their support (Renders et al., 2010).

Black et al. (2012) suggest that what matters in corporate governance varies from country to country due to their unique legal and regulatory enforcements. They argue that using common governance indices such as the Gompers et al. (2003) G-index or the ISS (formerly Risk-Metrics) governance measure to evaluate governance quality of firms outside of the US may lead to misleading conclusions. This is because the provisions used to construct these indices (e.g. takeover provisions) are specifically relevant to the US and may not be as important for companies operating under different ownership structures or institutional setups (p. 935).[12]

A key study that compares different legal systems around the world is that of La Porta et al. (1999) in which common law legal systems found in the US and the UK have been recognised to provide greater investor protection for minority shareholders in comparison with countries with civil law origins. Further, within the civil law system, the authors differentiate between Scandinavian, German and French originated laws arguing that among these three systems, the

[12] For example, the US grants much more freedom to both the acquiring party and to the target company whereas in Europe takeover activity is far more tightly controlled under EU directives applying to both corporate raiders and the target company's management team. Such differences are likely to reflect differences in ownership structure, being widely dispersed, giving management considerable influence at board level in the US, while European entities are owned by controlling shareholders. See http://cjel.law.columbia.edu/preliminary-reference/2017/takeover-regulation-in-europe-and-the-united-states-will-there-be-convergence-within-europe-and-between-europe-and-the-u-s/

Scandinavian system offers the highest protection while the French system provides the least level of protection for companies' shareholders.

Mueller (2006) examines empirically the performance of firms incorporated in countries with different legal origins using the La Porta et al. (1999) classification, and confirms that overall, firms domiciled in English common law countries have better performance as measured by their marginal q, defined as "the ratio of a company's returns on investment to its cost of capital". Marginal q is estimated at 1.02, on average, in English-origin countries, which is the highest among the classified legal systems; while the least performance belongs to the French-origin sample with a marginal q of 0.59 (p. 632).

This view is, further, supported by Renders et al. (2010) who conclude that firms established in countries with strong shareholder protection have better corporate governance rankings and tend to perform better based on various accounting and market-based performance proxies. Nevertheless, the authors suggest that improvements in firms' governance quality would seem to have a smaller effect on their performance in companies with better shareholder protection and higher corporate governance rankings. Overall, one needs to exercise caution in interpreting empirical evidence as unambiguously favouring one system over the other, recognising the salient differences in corporate governance across countries.

Within each system, various elements seem to emerge to complement each other and fit better within the overall system. Economic efficiency drivers and regulations have been shown to be key determinants of different ownership structures and governance arrangements around the world (Roe, 1996). The regulation systems within common law countries have emerged in a way that can provide better investor protection and transparency in comparison with their civil law counterparts. This provides greater monitoring power for small investors, contributing to a more favourable setting for dispersed, "outsider" ownership (Aguilera & Crespi-Cladera, 2016). Further, regulatory barriers such as restrictions for banks' involvements on firms' activities in common law countries might have given rise to a more dispersed ownership structure. This may also explain the emergence of highly developed capital markets catering the financing needs of firms incorporated in common law countries.

The legal rules in civil law countries, on the other hand, are alleged to deliver less protection for small investors against insiders' expropriation risks and weaker markets for corporate control. As a result of this, there has been a higher concentration of ownership and slow-paced development of financial markets compared to the common law systems. Therefore, in most

European countries, greater emphasis has been historically placed on bank debt rather than equity where the creditors exercise control by holding equity stakes and board membership (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1997). The European companies concentrated ownership structures may have resulted in governance regulations more concerned with protecting stakeholders' and insiders' interests rather than maximising firm market value. For instance, one can argue that considering the particular agency conflicts presented in their governance systems (i.e. principal-principal), European boards are developed to have a two-tiered structure which is recognised to be more efficient in providing intense monitoring and safeguarding minority shareholders from expropriations by dominant owners.

## 3.3 Data and Methodology

Traditionally, corporate governance has been assessed by measuring the extent to which corporations comply with governance guidelines and codes of best practice. Much of the empirical research on governance quality of companies in Continental Europe has focused on identifying different governance arrangements within companies in order to explain different firm outcomes. Many of these studies, however, reached ambiguous conclusions.

Krivogorsky (2006), for instance, draws on board structure and ownership concentration to examine whether corporate governance quality can explain different profitability ratios of 81 companies headquartered in nine European countries. Governance quality is valued based on the board system (unitary vs. two-tiered), the percentage of independent directors, and the number of elite representatives (with the highest qualification and experience) on the board. As measures of ownership structure, the author uses outsider shareholder concentration (i.e. institutions, block holders) as opposed to insider ownership concentration (family-owned, CEO founder, inside managers) and shows that although relational ownership and independent directors can positively affect profitability, no strong association exists between the companies' inside directors or managerial ownership and their profitability.

Likewise, in an attempt to investigate the governance-performance relation, La Rosa and Bernini (2018) use ownership structure, board size and CEO gender as proxies for corporate governance quality. They conclude that board size and the CEO's gender can add to higher operating profit for firms. However, ownership concentration of the firm is negatively related to its performance, in contrast to Krivogorsky's (2006) findings.

Djoutsa Wamba, Braune, and Hikkerova (2018) investigate the effects of corporate governance on firms' systematic risk by constructing their own Quality of Governance Index (QGI) using governance indicators from Thomson Reuter's ASSET4 database. In constructing this index, the authors first perform a principal component analysis on 53 items of ASSET4's assessment report to identify five key components of corporate governance; namely, management's commitment to shareholders, shareholders' rights, characteristics of the board of directors, transparency of financial information, and independence of the audit. They, then, compute an overall governance score by summing up the scores obtained from the five PCA models. They find that good governance can only weakly reduce the systematic risk of Western European companies.

Overall, existing governance measures seem to have weak explanatory power when it comes to valuing the governance quality of European firms. This can be linked to several reasons such as the complexity of corporate governance systems, endogeneity issues, and differences in institutional and legal attributes around the world. In my first essay, I discussed in detail how the newly constructed dynamic measure of governance may provide further insights into quantifying the governance quality of firms. I turn next to apply this model in a European context.

### 3.3.1 Sample Selection and Data

I begin by collecting data on all public companies listed in stock exchanges of 16 European countries including Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom. This is also the sample of countries used by Fama-French to determine risk factors for European markets.[13]

I use Thomson Reuter's Eikon as the primary database to collect most of the required data. Thomson Reuter's Eikon is a comprehensive database which gathers global information from various primary sources such as World Scope, Reuter's fundamentals, IBES, DataStream and Thomson Reuters ESG (Environmental, Social and Governance) Data. The SDC Platinum database is used to gather information on companies' mergers and acquisitions.

[13] See http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/f-f_3developed.html

The information for the sample firms has been reported in one of the following currencies: Euro, US Dollar, British Pound, Swiss Franc, Swedish, Danish or Norwegian Krone. Therefore, before moving forward with the empirical analysis, all data are converted to US dollars using the appropriate exchange rates. Again, US dollars is chosen as the base currency to ensure the consistency of the data with those used in Fama-French European portfolios construction.[14] The annual exchange rates are adopted from Eikon database. After excluding firms with negative book to market values, the sample consists of 85,617 observations on 4777 unique firms.

### 3.3.2 Corporate Governance Index

This essay follows the same approach used in the first essay to construct the governance index. I define six categories of firm outcomes that are being influenced by board decisions: financial reporting quality, capital structure, mergers and acquisitions, executive compensation, firm's financial and non-financial performance. In each category, I use proxies representing good governance quality according to prior literature on the topic. First, with regards to financial reporting quality, firms with good governance quality are considered to have less abnormal accruals. Second, it is assumed that acquiring firms with high quality of corporate governance provide higher abnormal returns to their shareholders during the acquisition announcement. An event study methodology is used to estimate the cumulative abnormal returns around acquisition announcements.

Third, well-governed firms are expected to use more equity financing. Although good governance can lower both the cost of equity and cost of debt financing, arguably equity financing is more sensitive to governance quality as debt holders can protect themselves (through covenants for instance). This assumption can be more relevant for the sample of European companies. As discussed earlier, it is quite common for European financial institutions to be present as owners of the companies and have representatives on board of directors. This may result in less information asymmetry between the firm and its creditors reducing the cost of debt. Therefore, an improvement in the governance quality of firms in

[14] Fama-French risk factors are computed using stock returns that are all in U.S. dollars. In their analysis, market return is computed as the return on a region's value-weight market portfolio minus the U.S. one month T-bill rate.

terms of mitigating information asymmetry can be expected to have more impact on equity financing.

In the executive compensation category, executive excess compensation is calculated as part of the executive's total compensation that cannot be explained by firm or executive's individual characteristics. It is hypothesised that well-governed firms are expected to be more successful in defining a well-established compensation scheme that is not excessive but is enough to align the interests of managers and shareholders. Nevertheless, this may be less relevant in the case where the firms' executives are also the owners of the company, like in family or founder-owned firms.

Finally, well-governed firms are expected to perform better in terms of both financial and non-financial (Corporate Social Responsibility) aspects of performance. This study measures firms' financial performance using their industry-adjusted return on assets where firms' industry codes are determined according to NACE (European Classification of Economic Activities) classification system. To quantify firms' non-financial performance, I rely on ESG scores from the Thomson Reuters ASSET4 database. I acknowledge that the ESG total scores involve information on the three sustainability pillars of environmental, social and governance factors, and thus, using this measure to value governance will have a confounding effect. I, therefore, perform all the analysis limiting this score to the average score of the environmental and social pillars.[15] In the ASSET4 database, an environment score is calculated for each company using several measures in three categories of resource use, emission reduction and innovative capacity to reduce environmental costs. The social score, on the other hand, includes four categories of human rights, workforce (e.g. job satisfaction and safe workplace), community (e.g. business ethics), and product responsibility (e.g. high-quality goods) (Refinitive, 2019).

To rule out the possibility that these measures are driven by other factors such as firm, industry or market characteristics, I first remove the influence of these variables (see the first essay for details) and use the residuals of the regressions in the analysis. Industry and year fixed effects and robust standard errors are included and all variables are winsorised at 1 and 99%

[15] The results remain consistent if the governance pillar is not excluded from the analysis.

levels to limit the impacts of outliers. The variables constructed based on the residuals of each regression are considered as the six governance sub-indices. Details on the definition of the employed variables along with their descriptive statistics and the results of the initial regression models are presented in Tables I, VI and VII in the Appendix.

A principal component analysis is, then, performed on the six governance sub-indices. The first principal component is used as the governance index, considering the fact that it explains the largest percentage of common variation among the governance sub-indices. Before conducting PCA, the validity of this method is assessed using Bartlett's Sphericity and Kaiser-Meyer-Oklin's (KMO's) Sampling Adequacy tests. The null hypothesis of Bartlett's test which states that the variables are uncorrelated, and the correlation matrix is not factorable needs to be rejected in order for the data to be suitable for PCA analysis. Furthermore, the KMO measure of sampling adequacy that measures the degree of common variance among the original variables should be above 0.5 to ensure that the sampling is sufficient and acceptable for further analysis (Tarchouna et al., 2017).

### 3.3.3 Corporate Governance and Boards Characteristics

It is now well established that board of directors as the governing body of corporations can have a great impact on business key decisions (e.g. Adams et al., 2010). What is not yet clear is how to value their effectiveness, because a board's dynamics are relatively unknown. No definite conclusion can also be drawn from prior research which often tries to explain the effectiveness of the boards based on their structure. To determine whether differences in firms' governance effectiveness (as measured by the new index) can be explained by board characteristics, the following regression model is employed:

$$Governance\ Index_{it} = \alpha + \beta_1\ Board\ Characteristics_{it} + \beta_2\ Controls_{it} + \varepsilon \quad (3.1)$$

Here, the dependent variable is the measure of governance performance. Considering the availability of the data, the board characteristics are quantified based on board size, gender diversity, the proportion of independent directors, meeting attendance frequency and CEO duality. The model, also, accounts for board types determining whether the sampled companies have a single (unitary) or dual (two-tiered) board with separate supervisory and management board of directors. In the Eikon database, the variable "Board Structure Type" may take three values: Two-tier, Unitary or Mixed. Within the mixed structure, the board of directors may

transfer some of its power to a direction committee which may comprise directors and non-directors. In order for the results to be comparable and as in the sample a small fraction of the companies (around 10%) reported a mixed board structure only in some years, I limit the sample into the two extremes (Two-tier and Unitary). I, further, include variables measuring firm size, age, value and risk (measured as the volatility of stock returns) to control for additional cross-sectional differences.

Apart from Ordinary Least Squares (OLS), I perform the regression analysis using fixed effects panel regression, dynamic OLS and Generalised Method of Moments (GMM) to account for various endogeneity issues that might affect the findings. A fixed-effect regression can address some of the endogeneity issues arising from unobservable factors. However, as noted by Wintoki et al. (2012), endogeneity in empirical research in corporate finance goes beyond unobservable heterogeneity and simultaneity capturing the dynamic nature of internal governance choices. Using a GMM model would probably have more power to account for different endogeneity problems such as unobserved heterogeneity, simultaneity and dynamic endogeneity.

### 3.3.4 Stock Returns, Firm Value and Operating Performance

From a theoretical point of view, well-governed firms are expected to be able to achieve greater firm value, generate higher profits and provide higher returns to their shareholders (Ammann et al., 2011; Caton et al., 2016; Claessens & Yurtoglu, 2013). To determine the effects of governance quality on stock returns, I construct decile portfolios where stocks are first ranked based on their governance index (from low to high governance quality at the end of each year[16]) and, then, allocated to one of the ten portfolios. As the higher values in the governance index represent better governance quality, the top decile portfolio (i.e. portfolio #10) contains firms with the highest possible governance quality, as measured by the index.

Average quarterly stock returns of equally weighted (EW) and value-weighted (VW) portfolios are then constructed. Quarterly stock returns are calculated as a geometric average of the monthly returns retrieved from Thomson Reuter's Eikon database. In constructing the value-weighted portfolios, returns of the firms within each portfolio are weighted according to

[16] Portfolios are generated at the end of each year as data required for the Index construction is unavailable for a number of sampled companies on a quarterly basis.

their companies' market capitalisation. Portfolio raw returns (unadjusted for risk) are, then, computed as the weighted average of the quarterly returns of firms in each portfolio. Next, to determine the return of passive buy-and-hold strategies, I compute one, two, three and four quarters' Holding Period Returns (HPR) for both equally- and value-weighted portfolios.[17]

To have a better understanding of how much of the generated returns can be linked to governance, portfolio returns need to be adjusted for various risk factors that might explain some of the differences in returns. According to Carhart (1997) and Fama and French (1993), apart from the impact of the overall market condition which can be captured by employing the CAPM model, one would also need to account for firm size, book-to-market ratio and momentum factors. The reason is that small firms and those with high book-to-market ratios tend to have higher expected returns than the CAPM prediction (Fama & French, 1993), and that stock prices show a tendency to continue rising if they have done well in the past year (winners) and continue declining if they performed poorly in the past year (losers), i.e. exhibit momentum (Carhart, 1997). I calculate risk-adjusted excess returns by regressing the portfolio returns on the four risk factors including $Mkt_t$, $SMB_t$, $HML_t$ and $MOM_t$ which represent returns on the Market (market effect), Small minus Big (size effect), High minus Low (value effect) and Momentum (winners minus losers) portfolios, respectively. The returns of the 10 portfolios, as well as the market portfolio, are computed in excess of the risk-free rate. Data on these risk factors are retrieved from Kenneth French's website.[18]

This study accounts for differences in countries' legal origins to investigate whether the results differ within different institutional settings. Accordingly, the sample is divided into two groups of companies operating in either civil or common law legal systems[19] and the portfolio analysis is repeated for the two samples separately. Based on prior research, I expect to find relatively higher governance quality and better stock performance in the sample for companies domiciled within the common law legal systems.

[17] As firms are allocated to portfolios at the end of each year (i.e. quarter 4), HPRs are calculated for 1, 2, 3 and 4 quarters of the following year.

[18] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

[19] Initially, I aimed at classifying the firms into four groups based on their legal origins: English common law origin (United Kingdom and Ireland); Scandinavian civil law origin (Denmark, Finland, Norway and Sweden); German civil law origin (Austria, Germany, Switzerland) and French civil law origin (Belgium, France, Greece, Italy, Netherlands, Portugal and Spain), following La Porta et al. (1999). However, due to data availability the sample sizes became too small, making it incompatible for further analysis.

Finally, in order to investigate whether governance quality can positively affect the value and operating performance of the firms, I run different regression models using the measure of governance quality as the explanatory variable. For dependent variables in these models, I include Tobin's Q (*TQ*) as a proxy for firm value, as well as Return on Assets (*ROA*), Return on Equity (*ROE*) and Net Profit Margin (*NPM*) which all represent the firm's operating performance. Stock raw return (*Return*) is used as an additional performance measure to capture the firm's stock market performance. I also account for other firm-specific factors that might affect performance by controlling for firm size (*Size)*, age *(Age)* and market-to-book value (*MB)*. Further, to ensure that the results are not driven by firm or industry differences among the firms, I re-run the regressions with fixed effects specifications and industry-adjusted performance measures. Year dummies are also included in all regressions to account for time fixed effects.

## 3.4 Empirical Results

### 3.4.1 Governance Index and Board Characteristics

The analysis begins by constructing an index that can quantify the board's effectiveness. Doing so, different firm outcomes that might be influenced by the board's decisions are classified into six areas: financial reporting quality (*Accruals*), acquisition performance (*CARs*), capital structure (*Equity_Ratio*), CEO's excess compensation (*Excess_Comp*), financial (*Financial*) and non-financial (*Non_Financial*) performance. Building upon the prior literature, it is hypothesised that acquisition returns, equity financing and financial and non-financial performance are increasing in "good" governance; while abnormal accruals and CEO's excess compensation are expected to be lower as governance quality of firms improves. Further, to rule out the possibility that these measures are driven by factors other than governance, these six measures are regressed on different firm and market variables and the residuals are considered as sub-indicators of corporate governance performance.[20]

These measures which represent good governance in different areas are, then, combined into a single governance index using principal component analysis. Before performing the analysis, Bartlett's test of sphericity and Kaiser-Meyer-Oklin's (KMO's) test of sampling adequacy were

[20] As a robustness check, I repeat all the analysis using the original variables (not the residuals) and find that the results are quite similar.

undertaken to ensure the applicability of PCA. First, the results of Bartlett's test validate factorability of the correlation matrix within the data. Second, the KMO test provides statistics equal to 0.613 which checks the box for the adequacy of the sample. I, therefore, continue with performing the PCA and employ the loadings of the first principal component to construct the measure of governance efficiency. The resulting index is:

$$Governance\ Index\ (GI) = 0.281\ Accruals + 0.101\ CARs + 0.389\ Equity\_Ratio - 0.530\ Excess\_Comp + 0.539\ Financial - 0.432\ Non\_financial \quad (3.2)$$

Based on the result of the PCA, the first principal component explains 44 per cent of the variations among the original variables[21]. This is higher than the 28 per cent of variation being captured by the first factor in the US sample employed in our first essay. This discrepancy could be attributed to data and sample-specific traits. For example, despite all efforts that have been made for a close replication of the analysis for the European sample, some variables have not been measured in an identical manner due to data availability.

Most component loadings seem to be consistent with the hypotheses signifying the expected relationship between each original variable and the underlying factor. More specifically, $CARs$, $Equity\_Ratio$, and $Financial$ have positive loadings which confirm that well-governed firms have higher acquisition returns, more equity financing and better financial performance; while the loading on *Excess_Comp* demonstrates a negative association between firms' governance quality and their CEOs' excess compensation. *Accruals* and *Non_financial,* which respectively represent firm's financial reporting quality and non-financial performance, are the two exceptions that appear with unexpected loading signs[22].

A possible explanation for the unexpected signs of *Accruals* and *Non_financial* might be that companies' commitment to financial reporting and CSR (e.g. social or environmental factors) is more sensitive to the institutional frameworks and law enforcement in the country level rather than the internal governance forces. According to Macías and Muiño (2011), although the introduction of International Financial Reporting Standards (IFRS) has led to the convergence of accounting principles at international levels, a number of European countries

[21] The detailed results of the PCA estimation can be found in Table VIII in the Appendix.

[22] The summary statistics and the pairwise correlations between the six sub-indices and the final governance measure are reported in the Appendix.

still require their firms to use local standards when preparing financial statements. Firms in these countries tend to have significantly lower levels of financial reporting quality, both prior and after the adoption of IFRS.

With regards to CSR, Jackson and Apostolakou (2010) consider national institutions as "a strong determinant of CSR practices at the firm level" and report a relatively higher level of CSR for companies located in Anglo-American countries. CSR strategies are developed as an alternative response to market failures resulting from inefficient regulations. Under civil law regimes where stakeholders can easily make claims and benefit from stronger protections, firms are less needed to act in a socially responsible manner over and above meeting the legal requirements. This may result in "CSR strategies to be largely redundant in light of constraints and requirements already in place" (Liang & Renneboog, 2017, p. 857). CSR is, further, perceived to be "simply the manifestation of agency problems" where opportunistic managers divert corporate resources to value-destructive overinvestment in CSR in order to gain a good reputation among different stakeholders. Yet there is no doubt that if managers can utilise CSR engagement to resolve conflicts of interest among stakeholders, then we would expect CSR to be positively related to corporate governance mechanisms (Kruger, 2015). Finally, firms' accounting quality and non-financial performance may also be linked in a way that less socially responsible firms are more likely to engage in earning management activities that can reduce the quality of financial reporting (Hong & Andersen, 2011).

To empirically check for the possibility that the unexpected signs can be linked to the institutional quality of the countries, the sample is divided into two parts based on countries legal origins and the PCA is run separately for companies headquartered in common versus civil law countries. The resulting indexes for the two groups of companies are as follows:

$$Governance\ Index_{Civil\_Law} = 0.231\ Accruals + 0.079\ CARs + 0.453\ Equity\_Ratio - 0.509\ Excess\_Comp + 0.527\ Financial - 0.445\ Non\_financial \quad (3.3)$$

$$Governance\ Index_{Common\_Law} = -0.577\ Accruals + 0.106\ CARs + 0.447\ Equity_{Ratio} - 0.293\ Excess\_Comp + 0.548\ Financial + 0.264\ Non\_financial \quad (3.4)$$

As shown in the above equations, the unexpected signs are only observable in the civil law sample. When the sample is restricted to the common law countries only, *Accruals* and *Non_financial* variables both appear with the anticipated signs showing that firms with more effective corporate governance should have better financial reporting quality and non-financial

performance. Hence the results confirm that country-level institutional quality needs to be addressed before any judgement is made. Our findings suggest that in the civil law sample, companies may find it too costly at the margin, namely after certain level of compliance with accounting or CSR rules has been achieved, to divert further resources from other governance-related business activities.

After constructing the governance index, this study examines whether different characteristics of the board of directors can impact their effectiveness. As can be seen from Table 3.1 which summarises the selected variables representing different board characteristics, the median board in the sample has 10 members. On average, 53 per cent of the directors are independent and 17 per cent of the directors are female. Board members attend 93 per cent of board meetings and 75 per cent of the CEOs hold the position of the board chairman, as well. Finally, with regards to the board structure, the statistics show that only 34 per cent of the companies have a two-tiered board structure. These statistics are relatively similar (though with some divergence) to the US companies sample employed in the first essay. For instance, for the sample of US firms, the results showed that the median American board has 9 members of which 75 per cent were independent and 11 per cent were female directors.

**Table 3.1 Board of Directors Structure: Descriptive Statistics**

This table provides summary statistics of the board characteristics variables. *Board_Size* represents the total number of board members. Board gender diversity (*Female*) and the proportion of independent directors (*Independent*) measure the fraction of board members comprised of female and independent directors, respectively. *Meeting* is the average board meeting attendance (percentage). *CEO_Dual* is a dummy variable that equal to one if CEO is also the chairman; and zero otherwise. *Dual* is a dummy variable which equals one for dual boards and zero otherwise.

| Board Characteristics | Mean | SD | 25th Percentile | 50th Percentile | 75th Percentile |
|---|---|---|---|---|---|
| *Board_Size* | 10.951 | 4.228 | 8.000 | 10.000 | 13.000 |
| *Independent* | 0.532 | 0.295 | 0.375 | 0.545 | 0.700 |
| *Female* | 0.173 | 0.138 | 0.063 | 0.154 | 0.267 |
| *Meetings* | 0.932 | 0.259 | 0.911 | 0.956 | 0.983 |
| *CEO_Dual* | 0.748 | 0.434 | 0.000 | 1.000 | 1.000 |
| *Dual* | 0.337 | 0.473 | 0.000 | 0.000 | 1.000 |

Table 3.2 reports the regression results of the governance quality measure (*GI*) on different board characteristics and firm-specific factors. The results of the OLS estimation show that nearly all board characteristics proxies produce statistically significant effects on the firm's governance index. However, once potential sources of dynamics/endogeneity are accounted for by employing fixed effects, dynamic OLS and GMM estimators all board characteristics

coefficients except for *Independent* (proportion of the independent directors) become insignificant[23].

The significant negative coefficient of *Independent* is consistent with the view that inside directors are more valuable as they have more insights regarding the business day-to-day operation (Byrd & Hickman, 1992, p. 196). With regards to board structure (*Dual*), two-tiered boards seem to provide less effective governance for their firms as shown in the static model results. This is in line with Aras and Crowther (2012) who criticise dual boards for their higher costs of functioning and for certain deficiencies caused by poor information flows between management and supervisory boards. This relationship, however, becomes statistically insignificant once we control for dynamic endogeneity issues.

Finally, GMM validity tests confirm the reliability of the GMM estimation. More specifically, the Arellano-Bond test for second-order serial correlation (AR (2)) yields a p-value of 0.826 which cannot reject the null hypothesis of no second-order serial correlation. Similarly, the p-values of 0.285 and 0.251 for the Hansen J test of over-identification and difference-in-Hansen test of endogeneity, respectively, means that we cannot reject the null hypotheses that the instruments are valid and economically exogenous.

[23] We use two lags of governance in the model and include variables lagged three and four periods as instruments for the endogenous variables. To determine how many lags of governance are needed to capture the dynamic effects, a regression of current governance on four lags of past governance is estimated, controlling for other firm-specific characteristics. The result of this estimate also confirms that only the first two lags of governance are statistically significant, and thus, inclusion of two lags of governance is sufficient to ensure dynamic completeness.

**Table 3.2 Corporate Governance and Board Structure**

This table contains the results of OLS, Fixed-effects, dynamic OLS and system GMM estimations of the relationship between governance quality and board structure. *Board_Size* represents the total number of board members. *Independent* and *Female* are the fractions of outside and female directors. *Meeting* is the average board meeting attendance (percentage). *CEO_Dual* is a dummy variable that equal to one if CEO is also the chairman; and zero otherwise. *Dual* is a dummy variable which equals one for dual boards and zero otherwise. All regressions are run controlling for firm size, age, value and risk (return volatility) to control for additional cross-sectional differences. Year dummies are included in all specifications. Numbers in parentheses represent robust standard errors and *, **, *** indicates significance at the 10 per cent, 5 per cent, and 1 per cent, respectively.

| Dependent Variable: Governance Index | Static Models | | Dynamic Models | |
|---|---|---|---|---|
| | OLS | Fixed Effects | Dynamic OLS | System GMM |
| *Board_Size* | 0.013** | 0.056** | 0.014** | -0.024 |
| | (0.006) | (0.022) | (0.006) | (0.040) |
| *Independent* | 0.004*** | -0.002 | 0.002* | -0.015* |
| | (0.001) | (0.002) | (0.001) | (0.008) |
| *Female* | 0.004** | -0.009*** | 0.002 | -0.004 |
| | (0.002) | (0.003) | (0.001) | (0.007) |
| *Meetings* | -0.001 | -0.009*** | -0.001 | -0.013 |
| | (0.002) | (0.003) | (0.002) | (0.019) |
| *CEO_Dual* | 0.211*** | -0.200 | 0.084* | 0.193 |
| | (0.034) | (0.187) | (0.045) | (0.374) |
| *Dual* | -0.159*** | -1.699*** | -0.040 | -0.147 |
| | (0.050) | (0.102) | (0.050) | (0.421) |
| *GI (t-1)* | | | 0.576*** | 0.683*** |
| | | | (0.107) | (0.098) |
| *GI (t-2)* | | | 0.054 | -0.010 |
| | | | (0.079) | (0.064) |
| R-squared | 0.953 | 0.640 | 0.986 | |
| AR(1) test (p-value) | | | | (0.037) |
| AR(2) test (p-value) | | | | (0.826) |
| Hansen test of over-identification (p-value) | | | | (0.285) |
| Diff-in Hansen test of exogeneity (p-value) | | | | (0.251) |

## 3.4.2 Governance Quality, Stock Returns and Operating Performance

### 3.4.2.1 Summary Statistics

I turn next to generate decile portfolios based on the constructed governance index in order to evaluate whether portfolios of firms with strong governance quality can outperform their weakly-governed peers. The overall governance index ranges from -5.019 to 5.761, as shown in Panel A of Table 3.3. The portfolios are not identical in size in a way that fewer companies

are in the two extreme portfolios. It is, also, worth noting that the reason for having a relatively fewer number of companies in the final portfolios compared to the initial sample is that a lot of observations have been lost due to data availability when calculating the governance index.

**Table 3.3 Descriptive Statistics of the Portfolios Constructed Based on the Governance Index**

Panel A reports the summary statistics of the portfolios constructed based on the governance index. At the end of each year, firms are ranked based on their governance index (*Index*) and partitioned into ten portfolios according to their ranking. The higher the value of the *Index*, the better the governance quality of the firm. Thus, the 10th decile portfolio (HQ) consists of firms with the highest governance quality; whereas the 1st decile portfolio (LQ) includes firms with the weakest quality. Panel B reports the mean values of firm's financial measures and their correlations with the governance index (*GI*). Panel C reports the mean values of variables related to board structure. The last column reports the difference between the two means and their significance.

**Panel A: Descriptive Statistics of the Portfolios Constructed Based on Governance Index**

| Portfolio | Number of Firms | Mean | SD | Min | Max | 25th Percentile | 50th Percentile | 75th Percentil |
|---|---|---|---|---|---|---|---|---|
| 1 | 41 | -2.662 | 0.934 | -5.019 | -0.398 | -3.221 | -2.659 | -2.318 |
| 2 | 42 | -1.687 | 0.694 | -2.828 | 0.023 | -2.178 | -1.951 | -1.177 |
| 3 | 57 | -1.100 | 0.701 | -2.270 | 0.385 | -1.564 | -1.297 | -0.799 |
| 4 | 68 | -0.641 | 0.711 | -1.897 | 0.886 | -1.080 | -0.836 | -0.558 |
| 5 | 64 | -0.291 | 0.713 | -1.307 | 1.464 | -0.746 | -0.574 | -0.233 |
| 6 | 62 | -0.004 | 0.716 | -0.975 | 1.691 | -0.485 | -0.279 | 0.129 |
| 7 | 59 | 0.296 | 0.756 | -0.694 | 2.139 | -0.221 | 0.003 | 0.502 |
| 8 | 64 | 0.692 | 0.771 | -0.441 | 2.544 | 0.159 | 0.394 | 0.824 |
| 9 | 49 | 1.316 | 0.801 | 0.134 | 4.344 | 0.776 | 1.059 | 1.795 |
| 10 | 38 | 2.369 | 1.003 | 0.743 | 5.761 | 1.632 | 2.009 | 2.838 |

**Panel B: Governance and Financial Measures**

| | Correlation with G | Mean HQ Governance | Mean, LQ Governance | Difference |
|---|---|---|---|---|
| *Size* | -0.885*** | 13.387 | 17.810 | -4.423*** |
| *MB* | 0.238*** | 6.478 | 1.916 | 4.562*** |
| *ROA* | 0.393*** | 2.415 | 1.136 | 1.278*** |
| *Return* | 0.062*** | 0.185 | 0.104 | 0.081** |

**Panel C: Governance and Board Characteristics**

| | Correlation with G | Mean, HQ Governance | Mean, LQ Governance | Difference |
|---|---|---|---|---|
| *Board-Size* | -0.420*** | 7.907 | 13.814 | -5.907*** |
| *Independent* | -0.231*** | 0.521 | 0.591 | -0.070*** |
| *Female* | -0.304*** | 0.156 | 0.192 | -0.036*** |
| *Meetings* | 0.019 | 0.961 | 0.941 | 0.020*** |
| *CEO-Dual* | 0.109*** | 0.923 | 0.601 | 0.322*** |
| *Dual* | -0.155*** | 0.131 | 0.159 | 0.028 |

I compare the two extreme portfolios (portfolio #1 with the lowest governance quality and portfolio #10 with the highest governance quality) in terms of financial measures and board of directors' characteristics. According to Panel B, companies with high quality of governance tend to have higher market value and experience better performance, albeit being smaller. This is consistent with the findings presented by Gompers et al. (2003). Panel C shows that firms in the HQ governance portfolio have smaller boards with fewer independent and fewer female directors serving on the board compared to the LQ governance portfolio. Moreover, within the HQ governance portfolio, more CEOs (92%) hold dual CEO/chairman roles compared to the LQ governance portfolio where 60% of the CEOs serve as board chair. The correlation signs are mainly as anticipated. For instance, the fact that companies within the HQ portfolio have smaller boards seems to be in line with prior research that considers smaller boards as being more efficient due to their lower costs of coordination and social loafing problems (e.g. Coles et al., 2008).

#### 3.4.2.2 Portfolio Returns

Table 3.4 presents the results obtained from the preliminary analysis of portfolio returns. As shown in Panel A, the HQ portfolio (portfolio #10) representing firms with the highest governance quality index provides higher raw (risk-unadjusted) returns compared to the LQ portfolio (portfolio #1) which contains firms with the lowest governance quality in the sample. Nevertheless, the difference in average returns is only statistically significant for value-weighted portfolios.

Panel B presents the average returns of passive buy-and-hold strategies for different holding periods. The results indicate that a four-quarter strategy that buys the HQ portfolio and shorts the LQ portfolio provides 14.7% and 9.7% higher returns for VW and EW specifications, respectively. Moreover, within all holding periods, the higher decile portfolios have higher reward-to-volatility (Sharpe) ratios compared to portfolios in the lower deciles, which further confirms that HQ portfolios pay higher returns for an additional unit of risk.

**Table 3.4 EW and VW Portfolios Raw (Risk-unadjusted) Returns**

Panel A presents the average quarterly returns of EW and VW portfolios constructed based on the governance index (*Index*). Panel B provides average portfolios buy-and-hold returns. The first portfolio includes low governance quality (LQ) firms whereas the 10th decile portfolio comprises high quality (HQ) firms. Returns are raw and do not account for any types of risks. SD is the standard deviation of the portfolios. Sharpe ratio for each portfolio is calculated as (Mean Return- risk-free rate)/SD. Holding periods are stated on a quarterly basis.

**Panel A: Portfolio Raw (Risk-unadjusted) Returns**

| | Equally-weighted | | | Value-weighted | | |
|---|---|---|---|---|---|---|
| Portfolio | Mean Return | SD | Sharpe Ratio | Mean Return | SD | Sharpe Ratio |
| 1 (LQ) | 0.019 | 0.094 | 0.170 | 0.021 | 0.083 | 0.217 |
| 10 (HQ) | 0.040 | 0.087 | 0.425 | 0.049 | 0.097 | 0.474 |
| (HQ)-(LQ) | 0.029 | 0.091 | 0.286 | 0.036* | 0.091 | 0.363 |

**Panel B: Portfolio Buy and Hold Raw (Risk-unadjusted) Returns**

| | | Equally-weighted | | | Value-weighted | | |
|---|---|---|---|---|---|---|---|
| Holding Period | Portfolio | Mean Return | SD | Sharpe Ratio | Mean Return | SD | Sharpe Ratio |
| 1 | LQ | 0.017 | 0.094 | 0.149 | 0.019 | 0.081 | 0.198 |
| 1 | HQ | 0.041 | 0.087 | 0.437 | 0.051 | 0.097 | 0.495 |
| 1 | HQ-LQ | 0.024 | -0.007 | 0.288 | 0.032** | 0.016 | 0.297 |
| 2 | LQ | 0.042 | 0.141 | 0.277 | 0.043 | 0.115 | 0.348 |
| 2 | HQ | 0.088 | 0.141 | 0.603 | 0.109 | 0.157 | 0.675 |
| 2 | HQ-LQ | 0.046* | 0.000 | 0.326 | 0.067*** | 0.042 | 0.327 |
| 3 | LQ | 0.071 | 0.174 | 0.391 | 0.071 | 0.142 | 0.479 |
| 3 | HQ | 0.141 | 0.180 | 0.767 | 0.176 | 0.203 | 0.852 |
| 3 | HQ-LQ | 0.070** | 0.006 | 0.376 | 0.105*** | 0.061 | 0.373 |
| 4 | LQ | 0.099 | 0.196 | 0.490 | 0.098 | 0.162 | 0.586 |
| 4 | HQ | 0.196 | 0.218 | 0.885 | 0.245 | 0.253 | 0.957 |
| 4 | HQ-LQ | 0.097*** | 0.022 | 0.396 | 0.147*** | 0.091 | 0.370 |

Comparisons of mean returns of portfolios are, however, only suggestive of a possible relationship between governance and returns. Next, the Fama-French-Carhart four-factor model is used to account for different risk factors that could be explaining abnormal returns. By regressing portfolio returns over market risk ($Mkt_t - R_{ft}$), size ($SMB_t$), value ($HML_t$), and momentum ($MOM_t$) factors, raw returns can be adjusted for common risk factors influencing stock returns.

**Table 3.5 EW and VW Portfolios Risk-Adjusted Returns**

This table reports the regression results of portfolio returns on different risk factors for the EW (Panel A) and VW (Panel B) portfolios. The intercept ($\alpha$) is the risk-adjusted return. *b, s, h* and *m* are regression coefficients for the relevant risk-factors $Mkt_t - R_f$, $SMB$, $HML$, and $MOM$. Standard errors are reported in parentheses and *, ** and *** indicate significance at 10, 5 and 1 per cent, respectively.

| Portfolio | $\alpha_i$ (Risk-adjusted Return) | $b_i$ $(Mkt_t - R_{ft})$ | $s_i$ $(SMB_t)$ | $h_i$ $(HML_t)$ | $m_i$ $(MOM_t)$ |
|---|---|---|---|---|---|
| **Panel A: Equally-weighted Portfolios** | | | | | |
| 1 (LQ) | 0.010 | 0.738*** | -0.337* | -0.054 | -0.148 |
| | (0.007) | (0.079) | (0.201) | (0.174) | (0.096) |
| 10 (HQ) | 0.026*** | 0.690*** | 0.442*** | -0.379* | -0.074 |
| | (0.007) | (0.077) | (0.196) | (0.169) | (0.094) |
| **HQ-LQ** | 0.013*** | -0.049 | 0.079*** | -0.343*** | 0.066* |
| | (0.003) | (0.030) | (0.077) | (0.066) | (0.037) |
| **Panel B: Value-weighted Portfolios** | | | | | |
| 1 (LQ) | 0.011 | 0.672*** | -0.625*** | -0.098 | 0.050 |
| | (0.007) | (0.079) | (0.202) | (0.174) | (0.097) |
| 10 (HQ) | 0.035*** | 0.719*** | 0.400 | -0.380* | -0.050 |
| | (0.009) | (0.099) | (0.253) | (0.219) | (0.121) |
| **HQ-LQ** | 0.021*** | 0.045 | 1.039*** | -0.300*** | -0.108*** |
| | (0.003) | (0.034) | (0.087) | (0.075) | (0.041) |

In Table 3.5, the intercept (α) represents portfolio return in excess of the return that is offered to investors to compensate for risk. Risk-adjusted returns appear to be relatively higher in the portfolios of firms with better governance quality. Moreover, zero-investment strategies buying HQ and selling LQ portfolios would generate 1.3% and 2.1% statistically significant returns in EW portfolios and VW portfolios, respectively. This confirms that even after controlling for common risk factors, firms with better governance quality still enjoy a better stock performance.

To account for differences in countries institutional settings, I divide the sampled companies based on their legal origins into two groups of common and civil law and repeat the portfolio analysis for the two samples, separately. The results show that, on average, firms operating in countries with common law legal systems tend to have better firm-level governance quality as measured by the governance index. Moreover, the HQ portfolios (i.e. most effective governance arrangements) provide higher returns compared to the LQ portfolios in both samples. However, the difference between the performance of the two extreme portfolios (HQ-LQ) is generally higher within the common law countries. For instance, a zero-investment strategy that buys value-weighted HQ portfolio and shorts LQ portfolio generates 4.6%

statistically significant higher return in the common law sample; while a similar strategy only generates 1.8% higher returns in the civil law group. These findings are consistent with our expectations that countries institutional settings affect firm-level governance quality which would then be reflected in companies' stock market performance.

**Table 3.6 Institutional Quality, Corporate Governance and Portfolio Returns**

This table compares the average governance index and portfolio reruns for the two sample of common versus civil law countries. The average quarterly returns of the equally and value-weighted portfolios constructed based on the governance index (*Index*). Panel A provides the mean and median of the governance index in the two samples. Panel B reports portfolio raw (risk-unadjusted) returns. Panel C presents portfolio returns after adjusting the returns for risk factors. The risk adjustments are made using Fama-French-Carhart four-factor model. The first portfolio includes firms with the lowest governance quality (LQ). In contrast, the 10$^{th}$ decile portfolio involves firms with the highest quality of governance (HQ).

| | **Common-Law** | | **Civil-Law** | |
|---|---|---|---|---|
| | **Panel A: Corporate Governance Quality** | | | |
| | Mean | Median | Mean | Median |
| G-Index | 0.372 | 0.215 | -0.452 | -0.483 |
| | **Panel B: Portfolio Average (Raw) Return** | | | |
| | Equally weighted | Value-weighted | Equally weighted | Value-weighted |
| LQ | 0.023 | 0.019 | 0.017 | 0.021 |
| HQ | 0.068 | 0.077 | 0.027 | 0.042 |
| HQ-LQ | 0.045** | 0.058*** | 0.009 | 0.021 |
| | **Panel C: Portfolio Average (Risk-adjusted) Return** | | | |
| | Equally weighted | Value-weighted | Equally weighted | Value-weighted |
| LQ | 0.021* | 0.006 | 0.009 | 0.014* |
| HQ | 0.046*** | 0.054*** | 0.019 | 0.034*** |
| HQ-LQ | 0.021*** | 0.046*** | 0.006 | 0.018*** |

### 3.4.2.3 Firm Value and Operating Performance

To investigate whether firms' governance quality can positively influence their performance, various proxies of firm profitability are regressed on the measure of governance quality, controlling for other firm-specific factors that might affect performance. I examine five different measures of performance including *Tobin's Q*, Return on Assets (*ROA*), Return on Equity (*ROE*), Net Profit Margin (*NPM*) and stock market returns (*Return*) and include firm's size, age and market-to-book value as control variables. Further, to ensure that the results are not driven by firm or industry differences among firms, the regressions are estimated with fixed

effects specifications and industry-adjusted performance measures. Year dummies are also included in all regressions to account for time fixed effects.

Table 3.7 shows that all performance measures are positively and significantly associated with the governance quality of firms. All coefficients of the independent variable (*Index*) are statistically significant. In other words, an improvement in governance quality of firms can enhance firm performance. More specifically, the results show that after controlling for firm, industry and time fixed effects, a one-unit improvement in firm's governance quality can enhance their *Tobin's Q*, *ROE*, *ROA, NPM* and *Return* for 0.19, 0.29, 1.02, 0.73 and 0.33 units, respectively. These findings are consistent with theories that give central importance to governance when it comes to performance improvements (e.g. Shleifer and Vishny (1997)).

**Table 3.7 Governance Quality and Performance**

This table reports the results of model 3.1 regressions where five measures of performance (*Tobin's Q*, Return on Assets (*ROA*), Return on Equity (*ROE*), Net Profit Margin (*NPM*) and stock market return (*Return*)) is regressed on the proxy of governance quality of firms (*Index*). *Tobin's Q* is defined as the ratio of the market value of assets over the book value of assets. The market value of assets is calculated as the book value of assets plus the market value of equity less the book value of equity. *ROA, ROE* and *NPM* are calculated as the ratios of firm's total income over total assets, equity capital, and net sales, respectively. *Return* represents quarterly stock returns calculated as the geometric average of the monthly stock returns within each quarter. We also control for firm size (*Size)*, age *(Age)* and market-to-book value (*MB)* in all regressions although the coefficients are not reported in this table. Industry adjustments are made by subtracting the industry median of each measure from its actual value. Year dummies are included in all regressions. Standard errors are reported in parentheses and *, ** and *** indicate significance at 10, 5 and 1 per cent, respectively.

| | | Dependent Variables | | | | |
|---|---|---|---|---|---|---|
| | | Tobin's Q | ROE | ROA | NPM | Return |
| **OLS** | Actual | 0.164** | 0.256*** | 0.825*** | 0.922*** | 0.153** |
| | | (0.070) | (0.028) | (0.054) | (0.062) | (0.076) |
| | Industry-adjusted | 0.033 | 0.324*** | 0.549*** | 0.702*** | 0.154** |
| | | (0.075) | (0.026) | (0.052) | (0.063) | (0.076) |
| **Fixed Effects** | Actual | 0.271*** | 0.305*** | 1.283*** | 0.899*** | 0.393* |
| | | (0.090) | (0.053) | (0.143) | (0.108) | (0.234) |
| | Industry-adjusted | 0.193** | 0.292*** | 1.024*** | 0.731*** | 0.333*** |
| | | (0.090) | (0.051) | (0.129) | (0.103) | (0.233) |

## 3.5 Conclusion

This chapter provides empirical evidence on the governance quality of firms within a European context with the aim to determine whether it can affect firm performance. European

corporate governance arrangements have been shown to be rather distinct from the well-studied American governance systems due to different institutional and legal settings. The governance quality index is constructed using a sample of public companies from 16 European countries. Comparing the returns of the portfolios structured based on this index reveals that European companies with higher governance quality generally outperform their peers which possess lower quality of governance. The findings are consistent controlling for different holding period strategies and for common risk factors that may explain abnormal returns.

Differences in country-level macro factors were accounted by dividing the sample companies based on their legal origins into two groups of common and civil law systems. The results show that, on average, firms operating in countries that follow common law legal systems tend to have better firm-level governance quality and provide higher stock market returns compared to companies operating in civil law countries. Taken together, these results suggest that effective corporate governance can indeed improve European companies' performance. Nevertheless, firm-level governance effectiveness is shown to be influenced by country-level elements such as legal and institutional setups.

# Part III

# Conclusion

This thesis comprises three essays introducing a top-down approach for evaluating the board's effectiveness in a dynamic context focusing on the empirical outcomes of the decisions they make. The focus of the first essay is on constructing an index representing the quality of board's decision based on empirical outcomes rather than board structure and characteristics. The first step is to identify firm's most important outcomes being affected by their board's decisions. For a sample of S&P1500 companies, I define different proxies representing different dimensions of board's decision quality. Using principal component analysis these proxies are then pulled together to construct a "governance" index representing the overall performance of the board. The new governance measure is, then, used to explore whether firms with more effective boards of directors in terms of their outcomes are more likely to be closely associated with the different board characteristics recommended in corporate governance best practices. The results do not show any significant association between board characteristics and their board effectiveness as measured by the new index after accounting for possible sources of endogeneity.

The second essay sets out to investigate whether corporate governance quality, as measured by the constructed governance index, can bring about higher market value, operating performance and stock market returns. To do so, I first construct decile portfolios based on the governance index that explicitly account for the dynamic nature of internal governance choices. Comparing the returns of the portfolios in the highest decile with those in the lowest decile, I find that firms with higher governance quality outperform their peers which possess lower quality of governance. Even after controlling for different risk factors that might affect stock returns using the Fama-French-Carhart four-factor model, the findings show that zero-investment strategies that buy HQ portfolio and short LQ portfolio generate 3.9% and 3.2% statistically significant higher return for EW and VW portfolios, respectively. I also used regression analysis to investigate the association between governance quality, firm value and operating performance. The findings of these analyses, further, confirm that good governance can indeed lead to better performance as measured by *Tobin's Q*, *ROA* (Return on Assets), *NPM* (Net Profit Margin) and *Return* (stock returns).

The third essay provides empirical evidence on the governance quality of firms within a European context with the aim to determine whether governance can affect firm performance. European corporate governance arrangements have been shown to be rather distinct from the well-studied American governance systems due to differences in institutional and legal

settings. I follow the same procedure developed in the first two essays to construct a governance quality index for a sample of public companies from 16 European countries. Comparing the returns of the portfolios structured based on this index reveals that European companies with higher governance quality generally outperform their peers which possess lower quality of governance. The findings are consistent controlling for different holding period strategies and common risk factors that may explain abnormal returns. I, also, account for differences in country-level macro factors by dividing the sampled companies based on their legal origins into two groups of common and civil law originated systems. The results show that, on average, firms operating in countries with common law originated legal systems tend to have better firm-level governance quality and provide higher stock market returns compared to companies operating in civil law countries. More specifically, a zero-investment strategy that buys value-weighted HQ portfolio and shorts LQ portfolio generates 4.6% statistically significant higher return in the common law sample; while a similar strategy only generates 1.8% higher returns in the civil law group. These findings are consistent with our expectations that countries institutional settings affect firm-level governance quality which would then be reflected in companies' stock market performance.

The empirical findings in this study provide further insights into understanding the role of corporate governance on firm performance. Although theory offers several channels through which governance is expected to benefit firms, empirical work faces challenges. This study suggests that mixed findings of prior research on the governance-performance relation may be linked to how we define and measure governance. By focusing on firm outcomes rather than governance structure and characteristics, which may be endogenous, I find evidence linking governance quality to firm performance.

However, I do recognise that further research needs to be undertaken to corroborate these findings across different markets. Moreover, the results of this research seem to suggest a stronger relationship between CG and stock returns for the US and common law European countries as compared to the civil law European countries. It would be interesting to examine the comparability of the constructed index to the commonly accepted corporate governance indices such as G-index and E-index. Doing so, one may recreate portfolios based on these indices and investigate whether the findings remain the same. Research is also needed to detect other firm outcomes that can possibly be affected by boards decisions.

Another natural progression of this work is to find out if good governance firms appear to be more robust during periods of economic recessions or major shocks such as the GFC. In other words, one can investigate whether high governance quality firms would be in a better position to weather the storm. Moreover, despite my best efforts to remove market and firm-specific characteristics from the board's effectiveness measures (i.e. sub-indexes), errors cannot be excluded with certainty. More information on other possible external factors influencing board's performance would help to establish a greater degree of accuracy on this matter.

# Appendix

**Table I Definition of the Variables Employed to Generate Sub-indices**

| Variables | Definition |
|---|---|
| Age (log) | Calculated as the natural logarithm of firms' age in years. |
| BM | The book value of equity over the market value of equity (MV). |
| CAPEX | Firm's total capital expenditure divided by its total sales. |
| CAR | Cumulative Abnormal Returns three days before and after the acquisition announcements. Expected returns are calculated using Fama-French-Carhart four-factor model. |
| Compensation | CEOs' total compensation which includes salary, bonus, other annual pay, the value of restricted stock and options granted and all other compensation. |
| CSR | For US companies, CSR is calculated as the average of the seven social performance areas of community, corporate governance, diversity, employee relations, environment, human rights and product quality and safety provided by KLD database. For the European companies, CSR is estimated as the average of the ESG's environment and social scores adopted from Asset4 database. |
| Deal Size | The value of the deal over the market value of the acquirer. |
| Equity Financing | The Ratio of stockholder equity to firm's total capital. |
| Growth | Firm's sales growth, measured the ratio of current minus previous year's sales, all divided by previous year's sales. |
| Incentives | Executives' firm-specific wealth, measured as the sum of the value of CEOs' option portfolio calculated using Black-Scholes formula, and equity portfolio estimated by multiplying the number of shares held by the share price. |
| Ind-Leverage | Firm's industry median leverage. Industry codes are determined according to NACE (European Classification of Economic Activities) classification system. |
| Leverage | The ratio of firms' total liabilities over its total assets. |
| Link_Performance | Dummy variable equals one if the company has a policy for CEO compensation to be linked to TSR (Shareholder Return) and zero otherwise. |
| OCF | Cash flow from operating activities (operating activities, net cash flow minus extraordinary items and discontinued operations). |
| PPE | Gross amount of Property, Plant, and Equipment. |
| Profitability | Firm's operating income divided by its total assets. |
| Size | The natural logarithm of total assets. |
| TA | Total accruals for each firm in year t, measured as the difference between cash flow from operating activities and income before extraordinary items. |
| Tangible | The sum of net Property, Plant and Equipment (PPE) and inventories over total assets. |

| | |
|---|---|
| CEO Tenure | Measured as the number of years the CEO has held the title of chief executive officer. |
| Volatility | The standard deviation of monthly stock returns. |
| Vote-Pay | Dummy variable equals one if the company has a policy for shareholders to vote on executive pay and zero otherwise. |
| ΔSales-ΔRec | Percentage change in sales minus change in accounts receivables |

**Table II Summary Statistics of the Variables Employed to Generate Sub-indices (US Sample)[24]**

| Variables | Obs | Mean | SD | P 25th | P 50th | P 75th |
|---|---|---|---|---|---|---|
| Age (log) | 29460 | 2.678 | 1.177 | 2.069 | 2.909 | 3.504 |
| BM | 29479 | 0.545 | 0.523 | 0.280 | 0.448 | 0.674 |
| CAPEX | 29304 | 0.087 | 0.393 | 0.023 | 0.043 | 0.084 |
| CAR | 29497 | 0.072 | 0.125 | 0.000 | 0.000 | 0.134 |
| CEO Tenure | 26281 | 7.132 | 7.282 | 2.000 | 5.000 | 10.000 |
| Compensation | 24112 | 7.948 | 1.178 | 7.197 | 7.991 | 8.724 |
| CSR | 15121 | -0.004 | 0.423 | -0.200 | 0.000 | 0.200 |
| Deal Size | 17220 | 0.166 | 0.309 | 0.023 | 0.064 | 0.173 |
| Equity Financing | 29493 | 0.487 | 0.201 | 0.341 | 0.467 | 0.630 |
| Growth | 27815 | 0.136 | 0.809 | 0.000 | 0.078 | 0.187 |
| Incentives | 21565 | 9.699 | 1.679 | 8.679 | 9.682 | 10.726 |
| Ind-Leverage | 29497 | 0.520 | 0.123 | 0.427 | 0.525 | 0.591 |
| Leverage | 29438 | 0.509 | 0.199 | 0.367 | 0.528 | 0.654 |
| OCF | 29482 | 0.098 | 0.088 | 0.056 | 0.095 | 0.141 |
| PPE | 29416 | 0.546 | 0.395 | 0.231 | 0.454 | 0.803 |
| Profitability | 29489 | 0.095 | 0.100 | 0.056 | 0.092 | 0.139 |
| Size | 29493 | 7.252 | 1.765 | 5.985 | 7.154 | 8.411 |
| TA | 29448 | 0.054 | 0.103 | 0.016 | 0.046 | 0.080 |
| Tangible | 29263 | 0.419 | 0.248 | 0.209 | 0.411 | 0.612 |
| Volatility | 29371 | 0.110 | 0.068 | 0.066 | 0.093 | 0.134 |
| ΔSales-ΔRec | 27327 | 0.093 | 0.275 | -0.001 | 0.068 | 0.180 |

[24] After 1% winsorisation

**Table III Regression Results of the Governance Sub-indices (US Sample)**

This table represents the results of the six sub-index regressions where each sub-index is regressed on different firm or market characteristics other than governance. These regression models are as follows:

$TA_{it} = \alpha + \beta_1(\Delta Sales_{it} - \Delta Rec_{it}) + \beta_2 PPE_{it} + \beta_3 OCF_{it} + \beta_4 BM_{it} + \varepsilon$ (1); $CAR_{it} = \alpha + \beta_1 Deal\ Size_{it} + \varepsilon$ (2); $Equity\ Financing_{it} = \alpha + \beta_1 Size_{it} + \beta_2 Profitability_{it} + \beta_3 Growth_{it} + \beta_4 Tangible_{it} + \beta_5 Ind - Leverage_{it} + \varepsilon$ (3); $Compensation = \alpha + \beta_1 Size_{it} + \beta_2 Profitability_{it} + \beta_3 BM_{it} + \beta_4 CEO\ Tenure_{it} + \beta_5 Incentives_{it} + \varepsilon$ (4); $ROA = \alpha + \beta_1 Size_{it} + \beta_2 Age_{it} + \beta_3 BM_{it} + \beta_4 CAPEX_{it} + \varepsilon$ (5); $CSR = \alpha + \beta_1 Size_{it} + \beta_2 Profitability_{it} + \beta_3 BM_{it} + \beta_4 Leverage_{it} + \varepsilon$ (6).

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Age (Log) | | | | | 0.008 | |
| | | | | | (0.009) | |
| BM | 0.034*** | | | -0.216*** | -0.867*** | 0.000 |
| | (0.002) | | | (0.025) | (0.019) | (0.012) |
| CAPEX | | | | | -0.288*** | |
| | | | | | (0.075) | |
| CEO Tenure | | | | -0.008*** | | |
| | | | | (0.001) | | |
| Deal Size | | -0.017 | | | | |
| | | (0.009) | | | | |
| Growth | | | -0.026*** | | | |
| | | | (0.003) | | | |
| Incentives | | | | 0.111*** | | |
| | | | | (0.009) | | |
| Ind-Leverage | | | -0.310*** | | | |
| | | | (0.032) | | | |
| Leverage | | | | | | -0.066 |
| | | | | | | (0.039) |
| OCF | 0.428*** | | | | | |
| | (0.013) | | | | | |
| PPE | 0.074*** | | | | | |
| | (0.004) | | | | | |
| Profitability (Log ROA) | | | 0.035*** | 0.119*** | | 0.015** |
| | | | | (0.002) | | (0.006) |
| Size | | | -0.022*** | 0.282*** | -0.018 | -0.018 |
| | | | (0.003) | (0.003) | (0.011) | (0.012) |
| Tangible | | | -0.037* | | | |
| | | | (0.016) | | | |
| ΔSales-ΔRec | -0.093*** | | | | | |
| | (0.003) | | | | | |
| R-squared | 0.323 | 0.182 | 0.097 | 0.373 | 0.195 | 0.202 |

[a] **, **, *** indicates significance at the 10 per cent, 5 per cent, and 1 per cent, respectively.*

[b] *Numbers in parentheses represent robust standard errors.*

**Table IV PCA Analysis of Corporate Governance Sub-indices (US Sample)**

This table represents the result of the PCA analysis of the six corporate governance sub-indices. The first sub-index (Accruals) represents financial reporting quality in firms and is measured by the value of abnormal accruals. The second measure (*CARs*) represents acquisition performance as cumulative abnormal returns three days before and after the acquisition announcements. The third measure (*Equity*) is the ratio of equity financing in firms representing capital structure and financing decisions of the firms. The fourth measure (*Excess Comp*) is the amount of excess compensation paid to the CEOs. Excess compensation is defined as part of the total compensation that cannot be explained by firm or CEO characteristics. The fifth and sixth measures (*Performance* and *Non-financial*) are firms' ROA and corporate social responsibility scores representing financial and non-financial performance, respectively. Component loadings represent the relationship between each variable to the underlying factor.

| Component | Eigenvalue | Difference | Proportion | Cumulative |
|---|---|---|---|---|
| Comp 1 | 1.6621 | 0.2668 | 0.2770 | 0.2770 |
| Comp 2 | 1.3953 | 0.1258 | 0.2325 | 0.5096 |
| Comp 3 | 1.2695 | 0.4775 | 0.2116 | 0.7211 |
| Comp 4 | 0.7920 | 0.0850 | 0.1320 | 0.8531 |
| Comp 5 | 0.7070 | 0.5328 | 0.1178 | 0.9710 |
| Comp 6 | 0.1742 | . | 0.0290 | 1.0000 |

Eigenvectors (Loadings)

| Variable | Comp1 | Comp 2 | Comp 3 | Comp 4 | Comp 5 | Comp 6 |
|---|---|---|---|---|---|---|
| *Accruals* | -0.1078 | -0.5841 | 0.0732 | 0.7784 | 0.1486 | -0.1180 |
| *CARs* | -0.5385 | 0.2200 | 0.4675 | 0.1955 | -0.3681 | 0.5189 |
| *Equity* | -0.2643 | 0.4873 | -0.383 | 0.2747 | 0.6493 | 0.2212 |
| *Excess Comp* | 0.6841 | -0.0514 | 0.2879 | 0.076 | 0.2445 | 0.6172 |
| *Performance* | 0.2885 | 0.5782 | 0.4393 | 0.3633 | -0.0387 | -0.5059 |
| *Non-financial* | 0.2779 | 0.1896 | -0.5946 | 0.3778 | -0.5996 | 0.1760 |

**Table IV Summary Statistics of Quarterly Governance Index and its Correlation with Sub-indices (US Sample)**

This table presents summary statistics for the constructed governance index (*Index*) and reports its correlation with each governance measure as well as the correlation among governance sub-indices. The first sub-index (*Accruals)* represents financial reporting quality in firms and is measured by the value of abnormal accruals. The second measure (*CARs*) represents acquisition performance as cumulative abnormal returns three days before and after the acquisition announcements. The third measure (*Equity_Ratio*) is the ratio of equity financing in firms representing capital structure and financing decisions of the firms. The fourth measure (*Excess_Comp*) is the amount of excess compensation paid to the CEOs. Excess compensation is defined as part of the total compensation that cannot be explained by firm or CEO characteristics. The fifth and sixth measures (*Performance* and *Non_financial*) are firms' ROA and corporate social responsibility scores representing financial and non-financial performance, respectively.

| | | | | | Correlations with Governance sub-indices [a] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Min | Max | *Index* | | *Accruals* | *CARs* | *Equity_ Ratio* | *Excess_Comp* | *Performance* | *Non_ financial* |
| | | | | | (Pearson) | (Spearman) | | | | | | |
| *Accruals* | 0.011 | 0.047 | -0.182 | 0.191 | -0.155* | -0.149* | | -0.036* | -0.029* | 0.029* | -0.072* | -0.045* |
| | | | | | (0.000) | (0.000) | | (0.000) | (0.006) | (0.007) | (0.000) | (0.000) |
| *CARs* | 0.110 | 0.044 | 0.023 | 0.232 | 0.550* | 0.544* | -0.036* | | -0.022* | -0.484* | 0.266* | -0.228* |
| | | | | | (0.000) | (0.000) | (0.000) | | (0.044) | (0.000) | (0.000) | (0.000) |
| *Equity_Ratio* | 0.461 | 0.111 | 0.130 | 0.734 | 0.673* | 0.636* | -0.045* | -0.025* | | -0.307* | 0.393* | 0.234* |
| | | | | | (0.000) | (0.000) | (0.000) | (0.000) | | (0.000) | (0.000) | (0.000) |
| *Excess_Comp* | 7.960 | 0.682 | 5.571 | 10.025 | -0.746* | -0.750* | 0.023* | -0.470* | -0.337* | | -0.157* | -0.204* |
| | | | | | (0.000) | (0.000) | (0.008) | (0.000) | (0.000) | | (0.000) | (0.000) |
| *Performance* | -3.843 | 0.387 | -5.893 | -3.004 | 0.617* | 0.638* | -0.133* | 0.219* | 0.467* | 0.144* | | 0.243* |
| | | | | | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | | (0.000) |
| *Non_financial* | 0.034 | 0.112 | -0.283 | 0.486 | 0.245* | 0.321* | -0.048* | -0.214* | 0.375* | -0.204* | 0.295* | |
| | | | | | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | |

[a] *Pearson (Spearman) Correlations presented in the Lower (Upper) Diagonal*

[b] * *indicates significance at 5 per cent level.*

**Table VI Summary Statistics of the Variables Employed to Generate Sub-indices (European Sample)[25]**

| Variables | Obs | Mean | SD | P 25th | P 50th | P 75th |
|---|---|---|---|---|---|---|
| Age (Log) | 56036 | 2.199 | 1.010 | 1.609 | 2.303 | 2.890 |
| BM | 39834 | 0.978 | 1.164 | 0.347 | 0.648 | 1.148 |
| CAPEX | 36765 | -0.052 | 0.060 | -0.069 | -0.035 | -0.012 |
| CAR | 85617 | 0.383 | 3.598 | 0.000 | 0.000 | 0.000 |
| Compensation | 6340 | 1.844 | 1.157 | 1.144 | 1.865 | 2.576 |
| CSR | 7128 | 0.578 | 0.163 | 0.463 | 0.585 | 0.702 |
| Deal Size | 16551 | 0.262 | 0.540 | 0.014 | 0.067 | 0.249 |
| Equity Financing | 42023 | 0.471 | 0.251 | 0.287 | 0.446 | 0.643 |
| Growth | 25358 | 1.412 | 6.514 | -0.367 | 0.016 | 0.667 |
| Ind-Leverage | 81492 | 0.567 | 0.147 | 0.493 | 0.569 | 0.635 |
| Leverage | 42010 | 0.529 | 0.251 | 0.358 | 0.554 | 0.713 |
| OCF | 39760 | 0.033 | 0.210 | 0.005 | 0.058 | 0.120 |
| PPE | 40142 | 0.225 | 0.232 | 0.028 | 0.152 | 0.349 |
| Profitability (ROA) | 33088 | 1.369 | 1.145 | 0.792 | 1.560 | 2.152 |
| Size | 52624 | 12.610 | 2.688 | 10.741 | 12.420 | 14.373 |
| TA | 39710 | 0.027 | 0.093 | 0.002 | 0.032 | 0.064 |
| Tangible | 30525 | 0.402 | 0.240 | 0.206 | 0.399 | 0.579 |
| Volatility | 62887 | 0.123 | 0.126 | 0.060 | 0.089 | 0.139 |
| ΔSales-ΔRec | 25696 | -0.322 | 1.621 | -0.301 | 0.006 | 0.261 |

[25] After 1% winsorisation

**Table VII Regression Results of the Governance Sub-indices (European Sample)**

This table represents the results of the six sub-index regressions where each sub-index is regressed on different firm or market characteristics other than governance. These regression models are as follows:

$TA_{it} = \alpha + \beta_1(\Delta Sales_{it} - \Delta Rec_{it}) + \beta_2 PPE_{it} + \beta_3 OCF_{it} + \beta_4 BM_{it} + \varepsilon$ (1); $CAR_{it} = \alpha + \beta_1 Deal\ Size_{it} + \varepsilon$ (2);

$Equity\ Financing_{it} = \alpha + \beta_1 Size_{it} + \beta_2 Profitability_{it} + \beta_3 Growth_{it} + \beta_4 Tangible_{it} + \beta_5 Ind - Leverage_{it} + \varepsilon$ (3);

$Compensation = \alpha + \beta_1 Size_{it} + \beta_2 Profitability_{it} + \beta_3 BM_{it} + \beta_4 Age_{it} + \beta_5 Link - Performance_{it} + \beta_6 Vote - Pay_{it} + \varepsilon$ (4); $ROA = \alpha + \beta_1 Size_{it} + \beta_2 Age_{it} + \beta_3 BM_{it} + \beta_4 CAPEX_{it} + \varepsilon$ (5); $CSR = \alpha + \beta_1 Size_{it} + \beta_2 Profitability_{it} + \beta_3 BM_{it} + \beta_4 Leverage_{it} + \varepsilon$ (6).

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Age (Log) | | | | -0.066 | -0.029 | |
| | | | | (0.63) | (0.021) | |
| BM | -0.001 | | | 0.011 | -0.287*** | -0.009 |
| | (0.008) | | | (0.036) | (0.022) | (0.028) |
| CAPEX | | | | | -1.044*** | |
| | | | | | (0.205) | |
| Deal Size | | 0.489 | | | | |
| | | (0.747) | | | | |
| Growth | | | -0.003 | | | |
| | | | (0.002) | | | |
| Ind-Leverage | | | -0.325*** | | | |
| | | | (0.038) | | | |
| Leverage | | | | | | -0.181 |
| | | | | | | (0.152) |
| Link-Performance | | | | -0.086 | | |
| | | | | (0.076) | | |
| OCF | 0.312*** | | | | | |
| | (0.010) | | | | | |
| PPE | 0.032*** | | | | | |
| | (0.005) | | | | | |
| Profitability (Log ROA) | | | 0.018*** | 0.115*** | | 0.005 |
| | | | (0.002) | (0.024) | | (0.014) |
| Size | | | -0.027*** | -0.146*** | -0.146 | 0.110** |
| | | | (0.006) | (0.021) | (0.021) | (0.046) |
| Tangible | | | -0.099* | | | |
| | | | (0.024) | | | |
| Vote-Pay | | | | 0.097 | | |
| | | | | (0.068) | | |
| ΔSales-ΔRec | 0.001 | | | | | |
| | (0.001) | | | | | |
| R-squared | 0.561 | 0.03 | 0.238 | 0.208 | 0.183 | 0.197 |

[a] **, **, *** indicates significance at the 10 per cent, 5 per cent, and 1 per cent, respectively.*

[b] *Numbers in parentheses represent robust standard errors.*

**Table VIII PCA Analysis of Corporate Governance Sub-indices (European Sample)**

This table represents the result of the PCA analysis of the six corporate governance sub-indices. The first sub-index (*Accruals*) represents financial reporting quality in firms and is measured by the value of abnormal accruals. The second measure (*CARs*) represents acquisition performance as cumulative abnormal returns three days before and after the acquisition announcements. The third measure (*Equity_Ratio*) is the ratio of equity financing in firms representing capital structure and financing decisions of the firms. The fourth measure (*Excess_Comp*) is the amount of excess compensation paid to the CEOs. Excess compensation is defined as part of the total compensation that cannot be explained by firm or CEO characteristics. The fifth and sixth measures (*Performance* and *Non_financial*) are firms' ROA and corporate social responsibility scores representing financial and non-financial performance, respectively. Component loadings represent the relationship between each variable to the underlying factor.

| Component | Eigenvalue | Difference | Proportion | Cumulative |
|---|---|---|---|---|
| Comp 1 | 2.6720 | 1.5626 | 0.4453 | 0.4453 |
| Comp 2 | 1.1094 | 0.1056 | 0.1849 | 0.6302 |
| Comp 3 | 1.0038 | 0.2874 | 0.1673 | 0.7975 |
| Comp 4 | 0.7164 | 0.4105 | 0.1194 | 0.9169 |
| Comp 5 | 0.3058 | 0.1132 | 0.0510 | 0.9679 |
| Comp 6 | 0.1926 | . | 0.0321 | 1.0000 |

Eigenvectors (Loadings)

| Variable | Comp1 | Comp 2 | Comp 3 | Comp 4 | Comp 5 | Comp 6 |
|---|---|---|---|---|---|---|
| *Accruals* | 0.2808 | -0.6179 | -0.2446 | 0.6381 | 0.0028 | -0.2689 |
| *CARs* | 0.1011 | 0.6771 | -0.5639 | 0.4448 | 0.0382 | 0.1185 |
| *Equity_Ratio* | 0.3891 | 0.2465 | 0.5925 | 0.3214 | -0.5745 | 0.0577 |
| *Excess_Comp* | -0.5305 | -0.2284 | 0.0345 | 0.3324 | -0.1628 | 0.7268 |
| *Performance* | 0.5395 | -0.0369 | 0.2177 | 0.0203 | 0.6362 | 0.5051 |
| *Non_financial* | -0.4325 | 0.2131 | 0.4717 | 0.4251 | 0.4871 | -0.3564 |

**Table IX Summary Statistics of Governance Index and its Correlation with Sub-indices (European Sample)**

This table presents summary statistics for the constructed governance index (*Index*) and reports its correlation with each governance measure as well as the correlation among governance sub-indices. The first sub-index (*Accruals)* represents financial reporting quality in firms and is measured by the value of abnormal accruals. The second measure (*CARs*) represents acquisition performance as cumulative abnormal returns three days before and after the acquisition announcements. The third measure (*Equity_Ratio*) is the ratio of equity financing in firms representing the capital structure and financing decisions of the firms. The fourth measure (*Excess_Comp*) is the amount of excess compensation paid to the CEOs. Excess compensation is defined as part of the total compensation that cannot be explained by firm or CEO characteristics. The fifth and sixth measures (*Performance* and *Non_financial*) are firms' ROA and corporate social responsibility scores representing financial and non-financial performance, respectively.

| | | | | | Correlation with Governance | | Correlations with Governance sub-indices [a] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Min | Max | Index | | Accruals | CARs | Equity_ Ratio | Excess_Comp | Financial | Non_fin ancial |
| | | | | | (Pearson) | (Spearman) | | | | | | |
| *Accruals* | 0.034 | 0.059 | -0.343 | 0.196 | 0.460* | 0.366* | | -0.042* | 0.042* | -0.092* | 0.279* | -0.381* |
| | | | | | (0.000) | (0.000) | | (0.102) | (0.104) | (0.000) | (0.000) | (0.000) |
| *CARs* | 0.136 | 0.040 | -0.242 | 0.429 | 0.165* | 0.174* | -0.089* | | 0.083* | -0.226* | 0.025 | -0.045* |
| | | | | | (0.000) | (0.000) | (0.000) | | (0.001) | (0.000) | (0.334) | (0.080) |
| *Equity_Ratio* | 0.447 | 0.081 | 0.140 | 0.773 | 0.636* | 0.625* | 0.075* | 0.135* | | -0.478* | 0.582* | -0.095* |
| | | | | | (0.000) | (0.000) | (0.000) | (0.000) | | (0.000) | (0.000) | (0.000) |
| *Excess_Comp* | 1.858 | 0.683 | -0.319 | 3.740 | -0.867* | -0.864* | -0.186* | -0.189* | -0.478* | | -0.712* | 0.534* |
| | | | | | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | | (0.000) | (0.000) |
| *Financial* | 1.416 | 0.528 | -1.737 | 2.888 | 0.881* | 0.879* | -0.125* | 0.174* | 0.644* | -0.751* | | -0.454* |
| | | | | | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | | (0.000) |
| *Non_financial* | -0.343 | 0.426 | -1.535 | 0.884 | -0.707* | -0.681* | -0.128* | -0.260* | -0.264* | 0.612* | -0.455* | |
| | | | | | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | |

[a] *Pearson (Spearman) Correlations presented in the Lower (Upper) Diagonal*

[b] ** indicates significance at 5 per cent level.*

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