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An Investigation of Corporate Governance Mechanisms and Value Creation in the United Kingdom

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Abstract

Corporate governance refers to the set of mechanisms that affect the decision-making process taken by managers of quoted firms where the ownership and control are separate. The impact of corporate governance on corporate performance has been the main theme of research in accounting and finance at least since Jensen and Meckling (1976) published their work. Typically, empirical studies investigate whether different corporate governance mechanisms have an impact on directors' behaviour or corporate performance. However, corporate governance studies are complicated by the endogenous relationship that exists between control forces such as capital markets, the regulatory system, factor markets, and internal governance mechanisms operating on a company and its decisions. This implies that the findings of empirical studies are questionable if these studies do not deal with endogeneity problems. A considerable number of empirical studies suggest that certain corporate governance mechanisms improve corporate performance, but those studies are affected by endogeneity issues. Roberts and Whited (2011) state that *"endogeneity leads to biased and inconsistent parameter estimates that make reliable inference virtually impossible"*.

The main purpose of this study, therefore, is to respond to these endogeneity concerns by using a well-developed generalised method of moments regression model (GMM) developed by Wintoki *et al.* (2012). The study examines the relationship between the board of directors' structure and corporate performance. Specifically, it investigates whether the presence of non-executive directors, duality, board size, director ownership, and the presence of board sub-committees have an impact on corporate performance. In addition, it also develops a governance index to find out whether the level of compliance with corporate governance regulations has an impact on corporate performance measured by ROA and Tobin's Q. To investigate these issues, the study adopts a comprehensive strategy which consists of three regression models, namely ordinary least square (OLS), fixed-effects model (FE), and generalised method of moments (GMM). Data for the analysis are extracted from annual reports, BoardEx database and Datastream databases for the period 1999 – 2009. The final sample includes a total of 634 UK firms listed on the London Stock Exchange.

The results indicate that the level of compliance with corporate governance regulations and board structure are both partly determined by past corporate performance. After controlling for this, the results show that there is no relationship between current board of directors' structure and corporate performance. Further, the level of compliance with the recommendations of corporate governance has no impact on profitability measured by ROA. The results further reveal that the level of compliance with the Combined Code on Corporate Governance also has no impact on Tobin's Q as a proxy of corporate performance. These findings are inconsistent with many prior empirical studies and policy recommendations on corporate governance, which suggests that corporate governance mechanisms develop corporate performance. In addition, the findings indicate that the results of the earlier corporate governance studies that do not take into account the dynamic nature of corporate governance may be affected by bias.

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Acknowledgement

Dedication

I dedicate this work to my parents and to

the soul of my brother "*Nasef*" may Allah be pleased with him

Chapter 1

An Overview of the Research

1.1 Introduction

During the last three decades corporate governance has been the focus of academic studies and it has become an independent area of research (Keasey *et al.*, 1997, Denis, 2001, Hilb, 2008). The main concentration of corporate governance research has widened and now covers areas including accounting and finance, law, management, and organisational behaviour, among others, without using a specific internationally accepted definition of the meaning of corporate governance (e.g., Mallin, 2009, Solomon, 2010). Consequently, corporate governance has been described by many, and many different definitions exist (e.g., Cadbury, 1992, Shleifer and Vishny, 1997, Denis and McConnell, 2003, OECD, 2004, Solomon, 2010). However, whilst the definitions of corporate governance have been described as wide or narrow, these descriptions depend on the focus of the corporate governance system itself: if it attempts to satisfy the interests of general stakeholders in society (Letza *et al.*, 2004, Gillan, 2006) or meet the insular interests of shareholders (Sternberg, 2004).

For instance, the narrow definition of corporate governance is *"the ways in which suppliers of finance to corporations assure themselves of getting a return on their investment"* (Shleifer and Vishny, 1997). This definition focuses only on the owners of firms, ensuring that the firm's value is maximised. Another example of the narrow definition is that it is the *"system by which companies are directed and controlled"* (Cadbury, 1992). Likewise, Sternberg (2004) defines corporate governance as *"ways of ensuring that a corporation's actions, agents, and assets are directed at the definitive corporate ends set by the corporation's shareholders"*. It has also been defined as *"a system whereby directors are entrusted with responsibilities and duties in relation to the direction of a company's affairs"* (Sheikh and Rees, 1995).

These definitions indicate that there are mainly three corporate governance mechanisms which play an important role in maximising the wealth of shareholders, namely board of directors, executive managers and the voting power of shareholders (Letza et al., 2004). Therefore, managers are appointed by the general assembly, and they are responsible for managing companies, and act in the best interest of shareholders (Cadbury, 1992). In addition, shareholders have the power to appoint or dismiss board of directors' members and control their actions through a general meeting. In contrast, the board of directors is responsible for managing the company in a proper way. The board's responsibilities include planning for future operations, employing skilled managers, monitoring the managers, and disclosing information to shareholders (Cadbury, 1992). In conclusion, the narrow definition of corporate governance focuses mainly on the relationship between managers and shareholders to maximise the wealth of the latter party without considering the possible stakeholders, such as funders, clients, workers and the society.

Adrian Cadbury participates in the work of the World Bank (1999) and gives a wide definition of corporate governance as "...concerned with holding the balance between economic and social goals and between individual and communal goals... the aim is to align as nearly as possible the interests of individuals, corporations, and society". Likewise, another wide definition is introduced by the Organisation for Economic Co-Operation and Development (OECD) (2004); it defines the corporate governance as it "involves a set of relationships between a company's management, its board, its shareholders and other stakeholders. Corporate governance also provides the structure through which the objectives of the company are set, and the means of attaining those objectives and monitoring performance are determined". Solomon and Solomon (2004) define corporate governance as "the system of checks and balances, both internal and external to companies, which ensures that companies discharge their accountability to all their stakeholders and act in a socially responsible way in all areas of their business activity".

It is obvious that these definitions suggest that the corporate governance system is wide enough to include the environment where a firm works and interacts with others such as

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stakeholders (OECD, 2004, Gillan, 2006, Mallin, 2009). Traditionally, as has been mentioned above, corporate governance mechanisms can include board of directors, managers and shareholders, but these mechanisms can go beyond these borders to include market regulations, the legal system, economic and political policies, labour markets, and any other organisations that deal with a company. This means that the company is accountable and responsible not only to its managers and shareholder, but also to different parties in its environment such employees, debt-holders, suppliers, government and domestic society (Freeman and Reed, 1983, Mallin, 2009). Therefore, the main objective of corporate governance is to align the interests of all stakeholders with managers and to ensure the efficient use of resources that the company has (World Bank, 1999). In other words, both definitions of corporate governance aim to increase the firm's value and corporate performance for the benefit of not only shareholders, but also for all other stakeholders.

As a result, the wide and narrow definitions of corporate governance have been used as a base to theorise and describe corporate governance systems (Agle *et al.*, 2008). A narrow definition focuses mainly on the benefits to shareholders (shareholding mode), as they are the owners and the management is responsible to them; whereas a wide definition goes beyond that to concentrate on the benefits to all stakeholders (stakeholding model), of whom shareholders are only one part. It is noticeable that the shareholding mode is common in countries where the legal system is dominated by common law, such as the UK and the US; whereas the stakeholding model is common in countries where the legal system is dominated by civil law, such as France, Germany and Japan (Clarke, 2007, Aguilera and Cuervo-Cazurra, 2009). The literature has indicated that both models depend on legitimate differences in theoretical background, main features, limitations and explanations (e.g., Weimer and Pape, 1999, Letza *et al.*, 2004).

The rest of this chapter is organized as follows. Section 1.2 explains the different concepts of corporate governance, focusing on the shareholding concept and the stakeholding concept. The motivations and objectives of this study are discussed in sections 1.3 and

section 1.4; while section 1.5 briefly discusses the structure of the thesis. The final section (1.6) presents a brief summary of the whole chapter.

1.2 Corporate Governance Concepts

The section aims to discuss shareholding and stakeholding models in the literature and display the theoretical background, main characteristics, limitations and weakness of every model. This section is divided into two subsections. The first subsection will discuss the shareholding mode and review prior studies in this regard, while the stakeholding model will be explained in the second subsection.

1.2.1 Shareholding Concept

The concept of shareholding model of corporate governance, as has been mentioned before, is common in the US, the UK and commonwealth countries, and it is usually called the Anglo-American model. This model of corporate governance mainly concentrates on the interest of shareholders as the owners of a company (Schwartz, 1983). Since the ownership of a company is separate from the management of it, then the company has to be managed to fundamentally serve the best interests of shareholders. This is the main assumption of the shareholding model (Berle *et al.*, 1932). The main source of capital is shareholders, who authorise managers to direct their business on their behalf. In this system, managers do not own companies, but they are responsible for control of day-to-day operations. Since there are many shareholders, ownership in this model is widely spread (Berle *et al.*, 1932).

A main consequence of the spread of ownership is that the shareholders cannot practise effective monitoring of their company (Blair, 1995, La Porta *et al.*, 1998). This is the main motivation of agency problems (Fama and Jensen, 1983b, Letza *et al.*, 2004). However, the agency theory suggests that because the principals, who are the shareholders, authorise agents, who are the board of directors' members, to manage the company on their behalf, theoretically they should act on the interests of the principals, but there is a possible risk that the directors may act in their own interests, which could eventually harm shareholders

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(e.g., Berle *et al.*, 1932, Jensen and Meckling, 1976, Fama, 1980). This is based on the assumption that the directors can practise their own opportunistic behaviour and also that they are skilled and rational, and can manage a company in the best way (Weimer and Pape, 1999).

The concept of shareholding suggests different proposals to mitigate these agency problems. First, there is a suggestion to create a type of incentive system by linking the directors' compensation to the corporate performance, so that any increase in corporate performance should lead to an increase in directors' compensation (e.g., Weimer and Pape, 1999, Core *et al.*, 2003). Second, another solution is to introduce efficient contracts that clarify the relationship between shareholders and directors (Jensen and Meckling, 1976, Kumar and Sivaramakrishnan, 2008). Third, it has been indicated that a corporate governance code of ethics should be developed by using a voluntary approach that regulates the managers' behaviour (Cadbury, 1992, Jones and Pollitt, 2004). Last, Letza *et al.* (2004) suggest that restrictions on factor markets should be removed and strengthened incentive systems such as bonuses and stock options.

On the other hand, any external impact or interference in companies by government or financial authorities may disfigure free market operations (Hart, 1995). From the concept of shareholding's perspective, a company's current governance system is a result of a bargaining procedure, in which external and internal parties have voluntarily engaged (Keasey *et al.*, 1997). In particular, it has been suggested that the efficiency of factor markets, such as capital market and labour market, which is supported by voluntary provisions of corporate governance codes, are an effective tool to monitor directors and reduce their opportunistic behaviour without interventions from external powers (Keasey *et al.*, 1997, Letza *et al.*, 2004). This assumption depends mainly on the fact that the main source of fund for companies is equity, which comes from efficient markets, rather than debt (Friedman and Friedman, 1982, Friedman, 2007). Additionally, it is clear that the markets in Anglo-American countries are more well developed than their counterparts in European counties (Weimer and Pape, 1999). This suggests that it is easy for shareholders to sell their shares in a company that performs poorly and shift to a company that performs

very well in the market; or the company that performs very well can acquire the company that performs very poorly. Likewise, directors of the company that performs poorly can be dismissed or replaced by new efficient directors.

Although the concept of shareholding has been widely accepted as the main corporate form (Keasey *et al.*, 1997, Clarke, 2007), it has its own limitations. These limitations mainly concentrate on the power of shareholders, social ethics, and the efficiency of factor markets, among others (e.g., Blair, 1995, Sternberg, 1997, Letza *et al.*, 2004, Sternberg, 2004). First of all, it has been indicated that shareholders may lack sufficient influence to monitor directors and stop misuse of a company's assets, as the concept of shareholding assumes (Blair, 1995). As has been described before, the main priority of the concept of shareholding is shareholders' interests, and they can choose directors of their company, and contribute to the decision-making process (e.g., Schwartz, 1983, Sheikh and Rees, 1995, Clarke, 2007). Practically, however, it is very difficult for shareholders to practise meaningful control and influence the decision-making process, since they have to follow specific procedures through the annual general meeting (e.g., Blair, 1995, Sternberg, 1997, Sternberg, 2004). For instance, usually the agenda of annual general meetings is prepared by directors; and it has been reported that shareholders cannot get compulsory decisions by their own initiatives in such meetings (Sternberg, 2004).

The second criticism is that directors, who are supposed to be the main defenders of shareholders' interests, also have their imperfections. It has been suggested that, since the executive directors are usually the prior managers of a company, they are unwilling to accept or admit or correct their own failure (Sternberg, 2004). Also, since non-executive directors are nominated by the chief executive officer (CEO) or board of directors, their ability to control may be weakened by the procedure of their nomination, appointment and remuneration (Sternberg, 1997, Vinten, 2001, Sternberg, 2004). However, because of the publication of recent corporate governance codes and regulations, the appointment procedures of non-executive directors have been improved; for example, the Combined Code on Corporate Governance (the Code) (2006) in the UK requires listed firms to

establish nomination committees, and all their members and chairman are independent non-executive directors.

The third weakness of the concept of shareholding is that it mainly focuses on short-term financial performance, since it is substantially based on the efficiency of capital markets, which makes managers work under great pressure. (e.g., Blair, 1995, Keasey *et al.*, 1997, Clarke, 2007). For example, shareholders prefer short-term high return for their investment, which reflects high share prices. On the other hand, if the prices of shares become low, this makes a company the target of takeover bids. This situation makes managers concentrate on the short-term profitability and ignore long-term projects such as spending more on research and development (e.g., Blair, 1995, Keasey *et al.*, 1997, Clarke, 2007). A clear example of this situation is the recent financial crisis, where one reason behind it was reckless risk-taking behaviour combined with the short-term bonus culture for the CEO and executive directors, particularly in the UK and the US (Farrell, 2009, Parker and Thomas, 2009, Turner Review, 2009, Walker Review, 2009).

In addition, stakeholding's supporters criticise the concept of shareholding in that it does not take into account the social responsibilities of the corporation towards its society, and narrowly defines the stakeholders (e.g., Freeman and Reed, 1983, Blair, 1995, Vinten, 2001, Clarke, 2007). Freeman and Reed (1983) and Hummels (1998) state that the company should not focus only on maximising the wealth of shareholders, but should also take into account the wide range of stakeholders, which may include suppliers, workers, creditors, debtors and domestic society; and as a result influence its long-term achievements. However, it is noticeable that companies that follow the concept of shareholding have contributed to their societies' development. For instance, practically, these companies create new jobs and pay taxes to governments, so they have a noticeable contribution to the society. On the other hand, it has been argued that, because the shareholders are a part of the stakeholders, therefore maximising the wealth of shareholders will consequently maximise the wealth of all stakeholders (Mallin, 2009, Jensen, 2010).

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Finally, stakeholding's supporters criticise the concept of shareholding in that it does not give the ethical concerns enough consideration (Sternberg, 2004). A clear example of this issue is the excessive remuneration of executive directors; for instance, in 2000 in the US, the compensation of the average chief executive officer was 531 times that of the average worker (Bogle, 2008). In this regard, the concept of shareholding unethically strengthens a specific class of the society, which is shareholders and directors, ignoring the other classes in the same society. Again, financial crisis provides examples of this issue. In the UK, the government has supported banks that have suffered from financial stress and reported record of losses - such as Royal Bank of Scotland and Lloyds Banking Group - with multimillions of bailouts; the media have reported that the executive directors in those banks continue to get paid huge bonuses (Farrell, 2009, Parker and Thomas, 2009, Turner Review, 2009, Walker Review, 2009, Jenkins and Goff, 2011). Therefore, this practice may be considered as transfer of the wealth from ordinary people (tax payers) to rich people (executive directors).

Since the concept of shareholding has many limitations and weaknesses, an alternative model has been offered to remedy those limitations. The next section will give a discussion about the stakeholding model. This is to get a better understanding of the meaning of corporate governance from different angles. As has been done before with the concept of shareholding, the section will explain the main assumptions of the model and its main limitations and weaknesses.

1.2.2 The Concept of Stakeholding

The concept of stakeholding depends on maximising the wealth of all stakeholders that includes not only shareholders but also every group that supports the presence of the firm (Blair, 1995). This concept of corporate governance is common in countries where the legal system is dominated by civil law, such as France, Germany and Japan. In contrast to the concept of shareholding, where the main exclusive interest is in shareholders, the concept of stakeholding encourages companies to inclusively consider all possible stakeholders who may be associated with the company in direct or indirect ways. Stakeholding is based on the concept that a company is formed from different social

groups; every group is considered to be a supplier of resources (contributions), and they expect their interests to be met (inducements) (e.g., Hill and Jones, 1992, Jensen, 2002, Jensen, 2010). For example, employees and directors supply the company with skills, expertise and time, and they expect to get good incomes; creditors supply the company with loans and they expect to be repaid; local society supplies the company with location and infrastructure and it expects the company to improve the quality of its life.

Therefore, distinct from the shareholding concept, the stakeholding concept assumes that the agency problems arise as a result of absence of stakeholders' effective representation on the board of directors (Letza *et al.*, 2004, Clarke, 2007). Similarly, as has been suggested by shareholding concept, the stakeholding concept suggest that the agency problems are a result of separation of ownership and management in quoted companies (Keasey *et al.*, 1997). Also, it follows the shareholding concept in that it assumes the agency problems may be solved by a nexus of contracts between all stakeholders of the company (Hill and Jones, 1992). In contrast to the shareholding concept, the stakeholding concept does not assume the important parties in agency relationship are shareholders and directors; whereas it accepts the assumption of efficient markets (Fama, 1965, Fama, 1970). Furthermore, it is also aware of the short-term market efficiency, which means that outside interventions are needed to increase the wealth of stakeholders (Hill and Jones, 1992, Weimer and Pape, 1999).

However, the stakeholding concept proposes a number of solutions for the above mentioned problems. First, it suggests that the board of directors should be a two-tier structure, representing the wide interests of stakeholders (Schilling, 2001, Mallin, 2009). Hence, in the counties where the stakeholding concept is common, such as Germany, firms normally have two boards of directors: the first is a supervisory board, which includes stakeholders' groups such as shareholders, workers, banks, suppliers, clients and governmental representatives (Edwards *et al.*, 2000, Schilling, 2001). The second board is the management board, which is required to direct the firm in the interests of all stakeholders, including shareholders as a part of all stakeholders (Schilling, 2001, Mallin, 2009).

The second proposal of the stakeholding concept is that the directors should be focused on strengthening the link between all stakeholders on one hand, and the company on the other (Letza et al., 2004, Clarke, 2007). Especially, the stakeholding concept encourages a strong relationship between companies, including the relationship between shareholders and workers, to take a part in the decision-making process through the supervisory board and keep the interests of all these parties balanced. However, since the stakeholding concept emphasises the interests of stakeholders as a whole, it therefore reduces the importance of investors as a main source of funding and concentrates on fund from debt. As a result, the equity markets, which are the main source of equity, seem to be less developed than their counterparts in countries where the shareholding concept is common. Also, banks, which are the main source of debts, seem to be more developed in the stakeholding concept zone (Weimer and Pape, 1999).

Finally, one consequence of the stakeholding concept is that it usually leads to a high level of ownership concentration. Ownership concentration and monitoring the directors by the supervisory board play an important role in mitigating agency problems. On the other hand, since the ownership is concentrated, this may weaken the small shareholders, which could be interpreted as a result of the legal protection of investors (La Porta et al., 1998). La Porta et al. (1998) report ownership concentration is negatively associated with investor protections; this relationship depends on the legal system in a country. Their findings display that in common-law countries such as the UK and US, where the ownership is dispersed, the investor protection is more stronger than in civil-law countries such as France, Germany and the Scandinavian countries, where the ownership tends to be concentrated.

However, it is clear that nowadays it is difficult to classify a corporate governance system as depending only on the stakeholding concept or the shareholding concept, for several reasons. First, companies are cross-listed in different markets; there are different requirements of corporate governance cross markets; and globalisation: all these have contributed to general similarity in corporate governance requirements (Aguilera and Cuervo-Cazurra, 2009, Filatotchev and Boyd, 2009). For instance, the Tokyo Stock

Exchange is a developed market like markets in the UK and US; it has historically been based on the shareholding concept (e.g., Hawley and Williams, 1997, Weimer and Pape, 1999). Second, the appearance of federations of investors, and recommendations by international organisations such the World Bank, seem to contribute to the development of corporate governance practices (Cuervo, 2002, Aguilera and Cuervo-Cazurra, 2009). Third, the publication of corporate governance reports and reviews, such as the Cadbury Report (1992) in the UK and the Ribbon Report (1999) in the US, have positively affected the development of corporate governance (Aguilera and Cuervo-Cazurra, 2009, Filatotchev and Boyd, 2009).

Like the shareholding concept, the concept of stakeholding has been criticised and has its own limitations. First, since the stakeholding concept requires firms to benefit a wide range of stakeholders, so the concept is not compatible with the business purpose, which is to maximise the wealth of shareholders - as the main objective of investing in a firm is to get profit from that (Sternberg, 1997, Jensen, 2002, Letza *et al.*, 2004, Sternberg, 2004, Jensen, 2010). Jensen (2002, 2010) indicates that if a firm is not allowed to pursue its main target, which is to maximise the wealth of the shareholders, the firm will collapse in the long-term. This has a negative impact not only on the shareholders, but also on all stakeholders. Second, there is no agreeable definition of the stakeholding concept yet. As the stakeholders are everyone who can affect or can be affected by the company, thus the number of stakeholders is countless (e.g., Freeman and Reed, 1983, Sternberg, 1997, Hummels, 1998, Sternberg, 2004).

Third, in corporate governance, directors and managers in a company are accountable to shareholders for their work. This relationship is obvious and clear in the shareholding concept, because the contractual parties are accurately defined. In contrast, this relationship is ambiguous in the stakeholding concept since the directors and managers are accountable to an uncertain number of stakeholders not only to shareholders alone (e.g., Sternberg, 1997, Sternberg, 2004, Solomon, 2010). On the other hand, it has been argued that accountability in the stakeholding concept can be achievable if the aim of it is clear to everyone included in this type of relationship (e.g., Sternberg, 1997, Gamble and Kelly,

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2001, Sternberg, 2004). Finally, the stakeholding concept has been criticised for not having objective standards that can be used to assess a company (Sternberg, 1997, Letza *et al.*, 2004, Sternberg, 2004). Since the directors are responsible for running a company to achieve the interests of stakeholders, corporate performance can be interpreted by different stakeholders in different ways.

1.3 Motivations of the Study

A number of corporate governance measures have been proposed to mitigate the agency problems between owners and managers. These measures have focused on the importance of the board structure and its sub-committees. (See for example Cadbury, 1992; Greenbury 1995; Hampel, 1998; Higgs, 2003; for the UK; the Blue Ribbon Committee, 1999; for the US, Tabaksblat Report, 2003; for the Netherlands, the Aldama Report, 2003; for Spain, the Bouton Report, 2002; for France; the Cromme Report, 2002; for Germany). In the UK, the Cadbury Report has emphasised a number of corporate governance mechanisms in its code of best practice that should be followed by UK listed firms. Even though the adoption of these measures is optional, UK firms are expected to comply with them, as the London Stock Exchange requires all listed companies to clarify in their annual reports whether they have complied with the code and to provide justification if they have not done so (Vafeas and Theodorou, 1998, Weir *et al.*, 2002, Financial Reporting Council, 2003, Financial Reporting Council, 2008, Financial Services Authority, 2008).

The investigation of the effectiveness of corporate governance measures has been an objective of many previous studies. However, no consensus of opinion has emerged in the research literature on the relation between corporate governance and corporation performance. For instance, Conyon and Mallin (1997) and Peasnell, Pope and Young (1998) indicate that there was an improvement in corporate performance after issuance of the Cadbury Report; while Weir, Weir and Laing (2000) and Laing and McKnight (2002) showed that the recommendations of the Cadbury Report produced no significant effect on corporate performance. Buckland (2001) argues that *"strengthening the power of non-executives on boards irrespective of those other control mechanisms might destabilise control and result in poor governance and performance in the compliant firms"*. He also

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adds that *"there is no evidence in either their characteristics or in their subsequent history that their compliance or non-compliance was significant in their behaviour or in their survival ... non-compliant firms were marginally more likely to survive"*. There is little consensus regarding the causal relationship between governance mechanisms and corporate performance. This signifies the need for further research in this area.

In addition, it is noticeable that many researchers who have empirically investigated the relation between corporate governance characteristics and corporation performance have used data related to US firms (e.g. Morck *et al.*, 1988, McConnell and Servaes, 1990, Hermalin and Weisbach, 1991, Agrawal and Knoeber, 1996, Beasley, 1996, Bhagat and Black, 1999, DeZoort *et al.*, 2003a, Vafeas, 2005). However, the generalisation of these conclusions regarding the relationship between firms' performance and characteristics of corporate governance may not extend across US borders. Although the main aim of corporate governance is to align the interest of directors with the best interest of shareholders, the regulations in each country, economic environment and governance practices are different. Moreover, accounting regulations, financial reporting requirements, and institutional differences such as insolvency code, tax system and ownership structure between the UK and the US further highlight the need for more research in this area (Main and Johnston, 1993, Rosenstein and Wyatt, 1994, Dahya and Travlos, 2000). Consequently, the impact of governance requirements should be separately investigated in each country (Aguilera and Cuervo-Cazurra, 2009, Filatotchev and Boyd, 2009).

Therefore, investigating the relationship between corporate governance and corporate performance and different legal requirements in different countries could offer insights into the impact of corporate governance. This study mainly attempts to explore corporate governance in UK listed firms, and it is motivated by several reasons. First, the UK corporate governance system has been improving since the publication of the Cadbury Report in 1992. Many corporate governance reviews and reports attempting to improve corporate governance system have been published in the UK. For example, the Greenbury Report (1995), the Higgs Review (2003), the Smith Review (2003) and a series of

combined codes have been issued since 1998 to 2010, focusing on different aspects of corporate governance. Thus, corporate governance seems to be continuously developing.

Another reason why this study considers UK listed firms for its investigation is because the majority of published studies have considered the US in their research (See for example, Yermack, 1996, Himmelberg *et al.*, 1999, Larcker *et al.*, 2007, Bhagat and Bolton, 2008, Coles *et al.*, 2008, Linck *et al.*, 2008). This is mainly due to the size of the US economy and the existence of a large body of researchers in the US academic institutions. However, it is also relevant to argue that the UK is the sixth biggest economy in the world, with a unique institutional set-up, and corporate governance requirements for listed firms. In addition, the differences in corporate governance requirements mentioned earlier between the US and the UK further justify the need for this research. Based on the above arguments, it is fair to argue that the relationship between corporate governance and corporate performance appears to have scope for more thorough investigation.

Similarly, the Companies Act (2006) in the UK has been amended to reflect changes in the corporate governance system and adopt the changes of the updated combined codes. The Combined Code on Corporate Governance has been revised and updated, and listed firms should follow the updated versions of the Code. For example, the Combined Code On Corporate Governance of 1998 requires a third of the board of listed firms to be non-executive directors. This changed to more than half of the board in 2003 when the code was updated. Additionally, the London Stock Exchange has introduced more strict listing rules which have adopted the recommendations of the Combined Codes on Corporate Governance in the UK (Financial Services Authority, 2008). Arguable, all these changes have an impact on both corporate governance mechanisms and, as a result, corporate performance.

In addition, few studies on UK corporate governance have used panel data to examine the relationship between corporate governance and corporate performance (Short and Keasey, 1999, Ozkan and Ozkan, 2004, Guest, 2008, Guest, 2009, McKnight and Weir, 2009, Guest, 2010). Moreover, none of the above mentioned studies have used the most up-to-date and comprehensive data, which makes this study different from the existing studies on

corporate governance in the UK. Also, the majority of the above mentioned studies have used data up to 2002, and many changes have occurred after that year. Further, none of the above studies have included in their empirical investigation a corporate governance index to measure whether compliance of the UK firms with the recommendations of the Combined Code on Corporate Governance is a determinant of firms' value.

The majority of existing empirical studies on corporate governance have modelled corporate performance as a function of corporate governance mechanisms. These empirical studies often face several serious methodological problems related to endogeneity (Guest, 2009, Wintoki *et al.*, 2012). First, in case of corporate performance and a specific variable of corporate governance are jointly determined by a specific control variable, this can cause unobserved heterogeneity. This problem can be solved by using a fixed-effects regression model. Second, a simultaneous endogeneity problem arises when a specific corporate governance variable and corporate performance may be simultaneously determined. Also, a dynamic endogeneity problem may occur as a result of a specific corporate governance variable being determined by the past corporate performance. To address these problems, a number of studies have attempted to employ an instrumental variable (See for example, Eisenberg *et al.*, 1998, Adams and Mehran, 2005, Bennedsen *et al.*, 2008). However, although employing instrumental variable regressions can possibly mitigate endogeneity, it requires a strict definition for instrumental variables, which is practically difficult (Wintoki *et al.*, 2012).

Therefore, it can be argued that examining the relationship between corporate governance mechanisms and corporate performance by employing fixed-effects models or instrumental variable regressions could lead to biased findings. In order to mitigate the endogeneity problem, Guest (2009) and Wintoki *et al.* (2012) suggest that using the generalised method of moments (GMM) estimator would be appropriate to examine the relationship between corporate governance and corporate performance. However, Guest (2009) and Wintoki *et al.* (2012) have not included other corporate governance mechanisms that empirically have an impact on corporate performance, such as director shareholdings and presence of board sub-committees. Further, they have not employed a corporate governance index among

their variables. In addition, there a few corporate governance studies have developed a corporate governance index to measure the extent to which firms have complied with corporate governance recommendations in the UK (Padgett and Shabbir, 2005, Arcot and Bruno, 2007). However, these studies have only focused on a limited period of time - four years and less - and have used ordinary least square regression to analyse their data. This study attempts to bridge this gap by examining an eleven-year period of time, from 1999 to 2009, using GMM to find out the impact of corporate governance mechanisms on corporate performance.

1.4 Objectives of the Study

It has been proposed that past corporate performance can affect the current board structure through two channels (Guest, 2009, Wintoki et al., 2012). First, Hermalin and Weisbach (1998) argue that the board independence is the result of a bargaining process between the CEO and the board. The CEO has the bargaining power from the past corporate performance. This leads to two important implications: first, the board's independence will be negatively related to ability of the firm's managers. The second implication is that the board structure will be associated with the past corporate performance. The second channel is that, since board structure is determined by firms' characteristics, such as sales growth, firm size, etc (Raheja, 2005), and these characteristics are affected by past corporate performance; therefore the board structure is related to the past corporate performance through the impact of corporate performance on firms' characteristics.

To address this challenge, the study adopts dynamic panel GMM regression, which has been developed in a number of academic papers (Holtz-Eakin et al., 1988, Arellano and Bond, 1991, Arellano and Bover, 1995, Blundell and Bond, 1998, Wintoki et al., 2012) to examine the impact of corporate governance on corporate performance. This enables the researcher to take into account unobservable heterogeneity by including firm fix-effects regression model. However, unlike fix-effects, GMM has the ability to capture the ability of current corporate governance to be affected by past corporate performance. Furthermore, dynamic GMM has the ability to take into account simultaneity by employing past corporate governance and corporate performance variables as instruments for current

corporate governance. This reduces the necessity of using external variables as instruments.

The main purpose of this study is, therefore, to investigate the relationship between corporate governance and corporate performance in listed firms over an eleven-year period. More specifically, this study investigates whether the level of compliance with the recommendations of corporate governance affects corporate performance. Also, it investigates the board's characteristics and their relationship with corporate performance. The purpose of examining the level of compliance and the board's characteristics is to better comprehend the exact impact on corporate performance. Further, the study investigates how corporate governance affects different measures of firms' value. In other words, how corporate governance affects the profitability measured by the return on assets ROA, and the future growth, measured by Tobin's Q.

This study finds several important conclusions. First, the level of compliance with governance regulations is positively related to profitability measured by ROA under OLS, fixed-effects and dynamic OLS models. However, the level of compliance has shown no relationship with the future growth measured by Tobin's Q. Second, applying dynamic OLS leads to a dramatic increase in R-square. Third, the use of dynamic GMM reveals that there is no relationship between corporate performance and the level of compliance with the recommendations of the Combined Code on Corporate Governance. Fourth, the presence of non-executive directors on the board is negatively related to profitability, while director shareholdings and the presence of nomination committees has a positive impact on profitability under OLS. However, duality, board size and the presence of nomination committees are positively related to Tobin's Q. Finally, the results of the GMM suggest that only director shareholdings are positively related to profitability.

The use of GMM regression has a number of limitations that have to be mentioned. First, since GMM depends on lags of corporate governance and corporate performance variables, there is the possibility of weak instruments. Second, the use of GMM assumes that there is no serial correlation among errors; this may not persist for all variables. Third, the use of lag variables in GMM assumes that any unexpected change in future corporate

performance is purely an exceptional error. This assumption implies that the GMM model includes any variables that have an impact on both dependent and control variables (Hansen and Singleton, 1982, Wintoki *et al.*, 2012). Finally, Wintoki *et al.* (2012) suggest that the dynamic panel GMM is not able to sort out all endogeneity problems.

1.5 Structure of the Study

The rest of this study is divided into five chapters, and these chapters are organised as follows. As has been mentioned before, this study attempts to explore the impact of corporate governance on corporate performance for UK listed firms. However, corporate governance is a very wide area. Therefore, Chapter Two will review not only the literature that is related to corporate governance mechanisms alone, but also the different theories, which could explain these mechanisms. It discusses the agency theory and its main principles in modern companies. It also reviews the extant theoretical and empirical literature and theories of corporate governance and shows to what extent the corporate governance mechanism affects corporate performance. This will cover the provisions of the Combined Code on Corporate Governance in the UK related to each corporate governance mechanisms.

Chapter Three will focus on the research methodology and data, explaining the data collection and methodology that will be used in the empirical chapters of this study. The chapter will explain the number of companies included in the analysis and the source of data. The chapter will also conduct a discussion about using different sorts of regression techniques. Further, the chapter will explain the measures of corporate performance and justify the reason behind using certain specific measures rather than others. Additionally, the chapter will explain the structure of the governance index of this study, referring to each corporate governance provision included in the index. Finally, the chapter will discuss the control variables and their possible impact on corporate performance.

Chapter Four will describe the level of compliance with the governance index for UK listed firms. It will describe the differences of level of compliance among industries for each provision included in the governance index. The chapter also will present the

empirical results based on OLS, fixed-effects, and GMM regression models. Chapter Four will also cover the results of empirical findings based on the level of the governance index models and corporate performance. The results of each model will be presented by using both corporate governance measures, which are the return on assets and Tobin's Q. Then the results of both corporate governance measures will be compared, to explore the differences between each measure.

Chapter Five will report the results of the relationship between characteristics of the board of directors and corporate performance. The second objective of this chapter is to develop the hypotheses and explain the variables of this research. For each variable, a theoretical discussion will be presented first, followed by the prior empirical studies. Specifically, the chapter will present the relationship between the presence of non-executive directors, duality, board size, director shareholdings, and the establishment of board sub-committees; and corporate performance. Each model will use the return on assets and Tobin's Q as a proxy for corporate governance.

Finally, Chapter six will summarises the findings and possible implications of the findings of this study. It will also highlight the recommendations, contributions, and possible areas for future studies.

1.6 Summary

This study will investigate the relation between corporate governance mechanisms and corporate performance in UK firms over the period 1999-2009. The focus will be concerned with an examination of the impact of corporate governance mechanisms on the return on assets and Tobin's Q as the most common measures of corporate performance. To achieve the aims of this research, the data will be collected from UK public companies registered on the London Stock Exchange during the period 1999-2009.

This chapter presented an overview of the whole thesis. It explained the definitions of corporate governance and the underlying motivations for pursuing the study, and discussed its justification. The chapter also explained the potential contributions of the study's

findings. It is hoped that the brief overview of all the chapters will make it easier for the reader to locate any particular areas of interest to them. The literature review in the next chapter presents an assessment of the theories and literature relevant to the study, highlighting pertinent points and identifying gaps in the subject area.

Chapter 2

Literature Review

2.1 Introduction

The conflict of interests among the contractual parties in firms has been the main focus of corporate governance literature since the article by Jensen and Meckling (1976). This conflict is mainly between directors, shareholders and debtors. A considerable number of prior studies have attempted to explain the nature of this conflict and its impact on corporations. Additionally, this conflict has been the main motivation to reform and regulate corporate governance. The Cadbury Report (1992) is regarded as the first initiative to reform and regulate corporate governance by proposing several corporate governance mechanisms. It has been the base of subsequent reports and reviews such as the Higgs Review (2003) and the Smith Review (2003), not only in the UK, but also around the globe.

This study presents a discussion reviewing the theoretical background of the relationship between corporate governance mechanisms and corporate performance. As has been mentioned in Chapter one, corporate governance mechanisms are products of different principles in different fields such as finance, management, and law (e.g., Durisin and Puzone, 2009, Mallin, 2009, Solomon, 2010). Consequently, prior studies have investigated corporate governance issues from different theoretical viewpoints. These viewpoints include agency theory, organisational behaviour, legal regulations, political and economic impacts, and shareholding and stakeholding concepts. Most of these theories have been reviewed in more detail by Clarke (2004). However, this study focuses on corporate governance from a financial perspective, and uses a quantitative research methodology to investigate the relationship between corporate governance mechanisms and corporate performance.

The main objective of corporate governance reforms in the UK is to encourage directors to act in the best interests of shareholders, as a result, reducing agency costs (e.g., Cadbury,

1992, Higgs, 2003). Generally, the vast majority of corporate governance studies have been conducted in the light of agency theory (Filatotchev and Boyd, 2009). However, recently it has been suggested that different theories should be used to exemplify the nature of corporate governance mechanisms, because agency theory itself includes many theoretical orientations such as information asymmetry and stewardship theory (Kiel and Nicholson, 2003, Haniffa and Hudaib, 2006, Filatotchev and Boyd, 2009, Van Ees *et al.*, 2009). Therefore, it is essential to review not only the literature that relates to corporate governance mechanisms alone, but also the different theories which could explain these mechanisms.

However, understanding the corporate governance mechanisms and their impact on corporate performance is an essential step, which this chapter attempts to achieve. This chapter reviews the extant theoretical and empirical literature and theories of corporate governance and shows to what extent the corporate governance mechanisms affect corporate performance. This chapter is organised as follows: section 2.2 reviews the agency theory and its causes; while section 2.3 discusses the development of corporate governance regulations in the United Kingdom. Section 2.4 explains the relationship between corporate governance and corporate performance, focusing on the level of compliance and characteristics of board of directors. The final section, section 2.5 presents a summary of the whole chapter.

2.2. Agency Theory

During the last decade, collapses of famous companies have emphasised the risks that are included in the contractual relationship between managers and shareholders. Unlike other fund providers such as debtholders and banks, shareholders are residual claimants on its dividends (Hansmann, 1992). Consequently, shareholders do not have an overt contract to assure their interest, but they depend on the corporate governance system to control management in order to balance their best interest with the interest of managers. Theoretically, it is the shareholders' responsibility to ensure a proper relationship with managers. Up to date, the corporate scandals of the twenty-first century have shown that, on a practical level, it seems difficult for shareholders to practise effective monitoring of

managers. In other words, it is an awkward task for shareholders to align the interests of managers with their own best interest, and it is clear that shareholders are the party most affected by the corporation collapses (Hermalin and Weisbach, 1998, Ferris *et al.*, 2003, Heath, 2009).

According to transaction cost theory and property rights theory, shareholders should get residual monitoring rights in the company since they are residual claimants and will push toward residual returns, which leads to the company having efficient managers. However, realistically, shareholders cannot monitor the firm. Berle and Means (1932) document that, over the period of the 1920s, shareholders of public firms were broadly distributed. Many small shareholders had shares in a small fraction of a huge company, and they were unable to direct the commercial operations and control the daily activities this was done by managers. This separation between ownership and monitoring leads to agency problem and agency theory. Agency problems have become the main focus of many studies since the publication of Theory of the Firm by Jensen and Meckling (1976). In that article, the authors have drawn attention to the contractual relationship between shareholders, managers and debt-holders. They concentrate on corporate governance by analysing it in terms of agency theory with the explanation of property rights theory. The majority of the literature has grown up to explain the nature of that relationship and how it can be resolved within the framework of agency theory.

The literature on agency problems has grown up rapidly since the publication of Jensen and Meckling's (1976) theory of the firm. This theory focuses mainly on conflict of interest between contracting parties, namely owners, managers and debt-holders. The literature attempts to clarify the nature of the conflict and how can be resolved. The Cadbury Report (1992) concentrates mainly on improving the monitoring mechanisms that restrict the degree of agency problems. In order to get a better understanding of what the Cadbury Report aims to achieve, it is essential to go through the agency conflict between managers and shareholders. It is difficult to summarise all the studies that have been conducted in the field of agency problems, but what follows is a summary of the main

points from the major studies that have been conducted, taking into account the causes of agency problems.

2.2.1 Agency relationship

Jensen and Meckling (1976) define an agency relationship as "*a contract under which one or more person (the principals(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent*". In terms of corporate governance, managers play the role of agents, who make decisions on behalf of shareholders, who are the principals. The main agency problem comes from the separation of decision-making. Decisions are made and managed by a firm's managers, whereasfirm's shareholders have no direct access to daily operating decisions. Shleifer and Vishny (1997) explain the agency problem as "*the difficulties financiers have in assuring that their funds are not expropriated or wasted on unattractive projects*". In this context, shareholders are expected to get profit or dividend from having shares.

Controlling agency problems is not a costless task since it is impossible to design a perfect contract for the behaviour of agent whose action influences the welfare of both the agent himself and the principal (Brennan, 1995). Shleifer and Vishny (1997) argue that "*Because of these problems in designing their contract, the manager and the financier have to allocate residual control rights, the rights to make decisions in circumstances not fully foreseen by the contract*".

Since managers are in a position to monitor and manage the company, they are able to get private benefits which shareholders cannot get or even control. Jensen and Meckling (1976) argue that opportunistic behaviour by managers can be reduced by providing the appropriate incentives for the managers to make choices that will maximise the firms' value. These incentives have their own costs, which are imposed on shareholders; these costs are captured by markets and affect the firms' share price. Agency costs can be noticed as loss of firms' share price as a result of high costs of minimising the conflict of interest between managers and shareholders. Jensen and Meckling (1976) consider agency

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costs as an unavoidable result of the agency relationship and these costs are the sum of monitoring, bonding and residual loss. The costs of monitoring include different types of expenditures, which are monitoring expenditures, bonding expenditures, and residual loss. The next sections present a brief explanation for each type of these costs.

2.2.1.1 Monitoring expenditures

Monitoring the behaviour of a firm's managers is an important mission in order to understand and judge to what extent managers have acted to maximise the firm's value. As mentioned earlier, monitoring is not a costless task; it has its own costs, and these costs are paid by shareholders to make sure managers (agents) act in the best interests of shareholders (principals). Fama and Jensen (1983b) argue that these costs will be shifted by agents to principals, since their compensation will be modified to cover the agency costs.

Regulations and code on corporate governance may also recommend specific factors for monitoring. For example, UK listed firms are required to comply with the Combined Code on Corporate Governance (the Code) which contains recommendations from previous reports of the Cadbury Report (1992), Greenbury (1995), Hampel (1998), Higgs (2003) and Smith (2003) committees. The Code recommends several mechanisms of monitoring that can play a considerable role in reducing agency problems and align the interest of managers with the best interests of shareholders. In case listed companies have not complied with the Code provisions, they must disclose and justify why they did not do so.

Denis, Denis and Sarin (1997) indicate that corporate control is limited to certain market forces or groups. These groups have both the financial sources to affect the cost of monitoring and the required experience to monitor the firm's managers. Burkart, Gromb and Panunzi (1997) concentrate more on director ownership as a monitoring motivation. They argue that monitoring is a costly task because managerial discretion comes with benefits to the firms and shareholders, and managers provide the company with their expertise and reputational capital, which shareholders do not generally have. The optimal level of corporate monitoring is determined by the firm's contracting environment

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(Himmelberg *et al.*, 1999). The mechanisms of corporate governance, which have been recommended by the Cadbury Report (1992) and some codes of best practice, have been criticised because these mechanisms could prevent managerial entrepreneurship (Short *et al.*, 1999). However, the subject of agency relationship leads us to consider another type of agency costs, that is, bonding expenditures.

2.2.1.2 Bonding expenditures

Agents understand and accept that they have to pay the costs of monitoring, and they are probably able to make monitoring structures to enable them to act in the best interests of their principals, or adjust their compensation according to their action. The costs of forming and complying with these structures are called bonding costs (Jensen and Meckling, 1976). The main cause behind the bonding costs is agents, but these costs are not only financial costs. They could involve the cost of generating extra information to shareholders and markets; but there are clear benefits for management to apply such structures. The bonding costs stop at the level when the managerial increase in bonding costs is equal to the managerial reduction in monitoring costs (Jensen and Meckling, 1976).

Denis (2001) proposes that one possible solution for agency problems is to design a contract indicating that agents will act in the best interest of principals. For instance, managers could agree to make decisions that maximise shareholder wealth, but this requires knowing every possible event and allocating what action the managers should take. In reality, this cannot be done because it is impossible to know every possible future situation. In addition, shareholders do not know exactly what action managers can take to maximise the firm's value. In fact, managers are hired for their expertise and the reputational capital that they have, and shareholders cannot force managers to do everything that shareholders wish by designing a perfect contract. However, shareholders can ensure that managers do some things which shareholders want by designing a less-than-perfect contract.

2.2.1.3 Residual loss

Theoretically, the objective of monitoring and bonding costs is to align the interest of managers with the interest of shareholders, but, in practice, it is difficult to fulfil this task. Therefore, there is a probability of conflicts of interest and this generates agency losses. Jensen and Meckling (1976) call this cost residual loss. It represents the value of output lost because the costs of full enforcement of contracts exceed the benefits (Fama and Jensen, 1983b). In real life, the behaviour of managers cannot be observed for every situation, because it is impractical to do so. Therefore, a contract with an optimal level of residual loss, which principals can affect and accept, may be the best solution to solve this problem. This could be considered as providing the managers with the discretion to achieve their own purposes and ignore the interest of shareholders.

The next section will briefly discuss different angles of agency theory, which are information asymmetry stewardship and resource dependence theories. These theories may offer more understanding of agency theory as a whole and the conflict between shareholders and directors. In addition, a discussion will be conducted about prior empirical evidence regarding the relationship between corporate governance and corporate performance.

However, it is also important to discuss the main assumptions of agency theory. This may offer clear understanding of the theoretical factors in the agency theory and also agency costs.

2.2.2 Assumptions of Agency Theory

2.2.2.1 Behavioural Assumptions

The behavioural assumptions of agency theory has been described by Jensen and Meckling (1994) highlighting several important elements in the human behaviour. First, they consider each person as an evaluator who is interested in improving each type of "good" such as wealth, peer appreciation and honour, etc. Second, the individual's needs are

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countless, which means s/he wants more goods for less and he cannot be satiated. Third. Jensen and Meckling consider each individual as a maximizer who tries to get the highest possible value that can meet his preferences and subject to constraints. In microeconomics these elements describe the opportunistic behaviour by managers in any firm. In addition, Jensen and Meckling add that

"Individuals are creative. They are able to conceive of changes in their environment, foresee the consequences thereof, and respond by creating new opportunities. Although an individual's opportunity set is limited at any instant in time by his or her knowledge and the state of the world, that limitation is not immutable. Human beings are not only capable of learning about new opportunities, they also engage in resourceful, creative activities that expand their opportunities in various ways." (Jensen and Meckling, 1994)

Thus, the agency theory assumes that individuals do not reactivate of traditional micro-theory, they are able to practice opportunistic behaviour. Taking into account these behavioural assumptions and given the fact that economic interests of shareholders and managers will not be perfectly aligned, and the fact that monitoring is not costless task, agency theory suggests that it is always possible that agents will not act in the best interests of principals (Jensen and Meckling, 1976). This has led Jensen and Meckling (1976) to draw the attention toward the main concept of "agency cost". In agency theory, agency costs occur in a situation where agents act in a way that benefits them at the expense of principals. Further, agency costs also cover the costs occur as a result of the efforts of principals to prevent the opportunistic behaviour of agents. For instance, in a company if an agent (manager) consumes on the position, this leads to an increase in the cost of productions and a drop in company's profit. In such this case it is suggested that agency costs have been generated to the extent of the amount of the manager's consumption. Furthermore, since principals (shareholders) have had placed monitoring mechanisms to prohibit the manager from consuming on the job, the monitoring costs are considered part of agency costs.

The next subsection will discuss agency costs of equity, the agency costs of debt and their relationship with ownership structure of the firm. Further, it is worth mentioning that

Jensen and Meckling (1976) have focused on that in the agency relationship individuals are aware of costs of involving in opportunistic behaviour and, as a result, it is in their interest to attempt to reduce agency costs.

2.2.2.2 Agency Costs of Outside Equity

The impact of agency costs of outside equity has been analyzed by comparing the behaviour of a manager who owns 100% of a firm with his behaviour when he sells a portion of the shares of his company (Jensen and Meckling, 1976). In terms of agency theory, It is expected that when the manager is the absolute owner of a firm, the manager will act to maximise his wealth. In this case, the manager will face only a traditional microeconomics issue where he is willing to increase his wealth by selecting between different sets of goods based on his own preferences and limited by the budget. To make it more clearer, Jensen and Meckling have categorised the set of goods into two groups. First, pecuniary returns which refers to the final wealth that the manager gets from his firm after tax. Second, the perquisites which refer to non-pecuniary aspects such as appointments of the office, employee discipline, etc.

However, when the manager sells a part of his firm in shares form, the shareholders have the right to obtain part of the profits that the company may have. In this case, agency theory anticipates that agency costs will occur in this situation. Since the manager only has a part of the company, so he only incurs a part of the costs from any perquisites he obtains from the firm and shareholders will take the other part of costs of such the cost. Therefore, the manager has the chance to get more perquisites at the cost of shareholders. Jensen and Meckling (1976) suggest that shareholders have the ability to limit the opportunistic behaviour of the manager by spending on monitoring up to the level where the cost of monitoring is equal to the benefit of monitoring.

In addition, the manager is an individual can bare agency costs and their impact. Based on that, Jensen and Meckling (1976) suggest another assumption the equity markets expect that the manager behave in a rational way. This implies that investors will be aware that the manager will be willing to increase his perquisite consumption if his ownership is

decreased and, as a result, the share prices decline. This reduction in share prices reflects agency costs from contractual arrangement. Therefore, it is desirable to increase managerial ownership as it play a role in encouraging managers to act in the best interests of shareholders. The main reason is that any decrease in agency costs leads to an increase in the price that investors will pay for the firm's shares. Thus, increasing the manager ownership through shares reduces the financing costs of the company.

Moreover, agency theory also anticipates that managers, who a number of shares in his firm, is willing to accept the presence of agency costs if his benefits form contractual relationship are great enough to satisfy his utility. In such these cases, the manager's benefits can be a form of diversification of wealth by liquidating assets or engaging in profitable risky projects which he could not have financed alone. However, it should be always remembered that the main aspect of this model is that monitoring managers is a task can be done by only rational shareholders without any participation from any other party or mechanisms.

2.2.2.3 Agency Costs of Debt

The behaviour of a manager can be compared when he is the only financer of the firm using his own wealth with a manager who has a proportion of the firm and fund the rest by using debt. When the manager funds his firm by debt, the lenders have the right to receive fixed payments at specific dates. In such this situation, agency theory suggests that agency costs will be generated. Since it is difficult to form a contract that perfectly protect lenders and cover all possible events in the future, the manager may take the opportunity to make decisions which increase his own wealth at the expense of lenders (Solomon, 2010). Specifically, Jensen and Meckling (1976) suggests that the manager will be in a position to engage in risk projects with high return. If these projects succeed, then the manager will enjoy profits, if not, the lenders will bear most of costs.

Moreover, if the lenders engaged in writing a contract with incredible details covering the most possible events in the future, agency costs would occur. There would be costs for forming such a contract and costs for implementing the conditions of the contract, these

costs would reduce profitability of the firm (Day and Taylor, 1998, Mallin, 2009). Similar to the cast of shareholders, it is assumed that rational lenders recognise inducements faced by shareholders and as a result pay less for the debt due to agency costs. Logically, this means that the manager pays for agency costs of debt and as a consequence it is in his best interest to reduce agency costs. Further, for shareholders it is acceptable to see the presence of agency costs as long as their benefits from the costs are large to increase his wealth (Jensen, 1986).

Finally, it is essential to understand that agency theory suggests that a manager is willing to pay higher cost to obtain fund from lenders as his ownership falls (Singh and Davidson Iii, 2003). The main incentive for the manager is that as the value of debt increases the manager has stronger motivation to increase the firm's exposure to risk since this leads to an increase of his equity. The increase in engagement of risky projects by the firm will mainly benefit the residual claimer as he can get possible higher profits. On the other hand, lenders have to share the risk of any project and receive the previously agreed fixed payments (Kaen, 2005, Keasey *et al.*, 2005).

2.2.3 Theory of Ownership Structure

The agency costs and ownership structure have been considered by Jensen and Meckling (1976). They have used the term of "ownership structure" rather than using "capital structure" to emphasise on that not only debt and equity are important, but also the equity owned by managers. They argue that since the manager who completely has to pay for agency costs, it is important for him to obtain external funds through debt or equity to minimise the total agency costs. Hence, a manager will be interested in finding external sources to fund profitable projects. The external fund can be obtained by issuing debt when the return from the new projects is more than the marginal agency costs of debt and these agency costs are less than those generated by selling more equity (Cho, 1998, Lemmon and Lins, 2003).

In contrast, the manager will select to issue shares when the return from investing in a new project is higher than the agency costs of external equity and these agency costs are less

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than those generated by issuing more debt. Overall, agency theory indicates that the manager will attempt to balance the fund from different sources; debt, equity and his own fund; in such a way to minimise the total agency costs (Jensen and Meckling, 1976). Therefore, in accordance with microeconomic theory, firms attempt to maximise their profits, in other words, they try to maximise the present value.

2.3.1 A Managerial Firm

So far, the discussion has focused on small or entrepreneurial firms ignoring the large modern companies. Thus, it is important to consider corporations where managers have little or no equity in their firm. Fama (1980) criticises the work of Jensen and Meckling (1976) for considering the firm as a set of contracts between different parties and not carrying far enough. Therefore, it is necessary to discuss agency theory in large modern firms where the control of the firm is in hands of managers who are separate from shareholders of the firm. Fama and Jensen (1983b) extend the work of Jensen and Meckling (1976) by building a special model for large firms where ownership is separate from control.

2.3.2 Separation of Ownership and the Role of Board of Directors

Fama and Jensen (1983b) start their approach by stating the main point which is "natural selection". This point means that if a firm or an organisation works in a highly competitive environment, then it must have significant advantages which others do not, or it must have special mechanisms that enable it to reduce agency costs. Hence, the main task for the theorists is to find out where these advantages reside. These advantages have two key sources (Fama and Jensen, 1983b, Fama and Jensen, 1985). First source is that the firm is managed by a group of professional managers. In this regards, it is argued that professional managers are likely to have high quality of decision skills compared with those of entrepreneurs. Second, since investors are free to buy and sell shares of a firm, this diversification enables investors to share and reduce their risks. By using this freedom, firms have an additional advantage of being able to obtain fund at relatively low cost.

Another important mechanism that help to reduce agency costs is the board of directors (Fama and Jensen, 1983b). It has been argued that in a firm in which ownership is separated from control, board of directors is a tool that can play a crucial role in reducing agency costs (Fama and Jensen, 1985, Jensen and Murphy, 1990). This can be explained as that shareholders authorise board of directors to control the firm, and in turn, board of directors appoint managers to administer the firm. The main role of the board is to monitor the management on behalf of shareholders. In addition, in the board itself there is difference between executive and non-executive directors to ensure that the board does not conspire with the management to proceed with opportunistic behaviour. The board is often dominated by a majority of independent non-executive directors who have the motivation to perform their duties and do not collude with managers (Baysinger and Butler, 1985, Zahra and Pearce Ii, 1989).

In addition, it has been mentioned that share prices are "visible signals" that can be used to monitor management performance (Warner et al., 1988, Gompers et al., 2003). Since the share prices change reflecting the market's evaluation of managerial decisions, firm management is likely to respond to pressure to perform in a way keeps share prices high (Fama, 1970, McConnell and Muscarella, 1985). Moreover, the takeover market is considered the last resort that works in when the internal control corporate governance mechanisms fail to control agency costs (Grossman and Hart, 1980, Jensen, 1986).

Jensen (1986) indicates that managers have motivations to extend the growth of their firm beyond optimal size. The growth leads to an increase in managers' power by increasing the resources under their control. It is also accompanied by an increase in managers compensation, which is positively related to the growth. In addition, Jensen suggests that conflicts of interests are intense between managers and shareholders over the use of excess cash flow. Managers may prefer to use the case flow to fund positive projects, while shareholders may prefer receiving dividends. Therefore, managers could expropriate shareholders not only through perquisite consumption but also by turning down dividends payments.

It is interesting to notice that moral hazard and holdup opportunism can be easily recognised as agency theory in small firms focuses on the former and ignore the latter. Alchian (1984) suggests that moral hazard opportunism occurs in firms when it is difficult for shareholders to monitor what managers did, is doing or will do with its assets. In contrast, Alchian (1984) suggests that holdup opportunism occurs in a situation where one party tries to expropriate the other by refusing to pay or serve and, moreover, the assets involved would lose much of their value. Therefore, a clear example of holdup opportunism would be refusal by managers to pay out free cash flows to shareholders.

However, managers can be motivated to disgorge accept paying cash by increasing debt. Jensen (1986) suggests that creating debt without retention of the proceeds of the issue, leads managers to keep their plans to pay out future cash flows. Therefore, debt can be deemed as a useful substitute for dividends. By issuing debt, managers have to pay out future cash flows in a form of periodical interests, otherwise they will face legal action from debtholders. Therefore, debt can reduces agency costs of free cash flow by reducing the case flow available for spending by management.

2.2.3 Supporting Theories of Agency Theory

2.2.3.1 Information Asymmetry

A considerable number of prior empirical studies have depended on information asymmetry and managerial signalling to explain the relationship between shareholders and directors (e.g., Healy and Palepu, 2001, Padgett and Shabbir, 2005, Black *et al.*, 2006b). Information asymmetry suggests that, since the directors manage the daily operations of a company, they have more information about the company than do shareholders or future shareholders (Healy and Palepu, 2001, Kapopoulos and Lazaretou, 2007). Because of this, investors face two choices when they make investment decisions in a company. First, they have to decide which firms have a good management team - this situation is called adverse selection (Rhee and Lee, 2008). The second possible problem is moral hazard, which means that the managers do not use the extra information in pursuit of extravagant behaviour; or confirming that managers distribute dividends to shareholders rather than to

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employees or other groups. This could lead to over investing, which could be more influential than managers' perquisites and may result in reducing corporate performance (Brennan, 1995, Kapopoulos and Lazaretou, 2007).

However, in the light of uncertainty and moral hazard, investors have to include the possible costs of these problems when they weigh up whether or not to invest in the investment opportunity (Jensen and Meckling, 1976, Mishkin, 2004). Regardless of which choice the investors go with, this situation may negatively affect the cost of outside equity for companies. In order for companies to reduce the impact of adverse selection and moral hazard, they have to adopt a good corporate governance system, which is considered a signal of the quality of a firm's management team. Theoretically, complying with recommendations of corporate governance codes is fundamentally regarded as a good signal by companies toward markets and investors. This indicates that, because a company follows the best practices of corporate governance, investors will be assured that managers will act in the best interests of shareholders. This means that the investors will offer high prices for companies with a good corporate governance system, because the investment in such companies will be profitable (e.g., La Porta *et al.*, 2002, Beiner *et al.*, 2006).

For instance, adding more independent non-executive directors to the board is considered a signal to investors and markets that the company will improve its corporate governance to meet the expectations of investors. Also, the disclosure of such an event is likely to increase the share price, due to the demand for shares by investors in the market, and to reduce information asymmetry (Black *et al.*, 2006b, Black *et al.*, 2006c). Consequently, an increase in share prices is supposed to reduce the cost of outside equity (Botosan, 1997).

2.2.3.2 Stewardship Theory

Stewardship theory assumes that managers are fundamentally trustworthy people and therefore they are good managers of investors' resources (Donaldson, 1990, Donaldson and Davis, 1991, Donaldson and Davis, 1994, Nicholson and Kiel, 2007). This suggests that these managers should have full authority to direct the business because they are trustworthy people as assumed by stewardship theory (Letza *et al.*, 2004). In addition,

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stewardship theory assumes that, because executive directors in the top level generally work for a long time in the firms they manage, so they have more knowledge and expertise than outside directors, and take priority when important decisions are made (Donaldson and Davis, 1991). Another assumption is that better decisions need knowledge and expertise, which executive directors have (Donaldson and Davis, 1994). In addition, stewardship theory assumes that the directors attempt to develop their reputation and human capital in the market, and they have to be competitive directors in the labour markets; this situation reduces agency costs (Fama, 1980, Fama and Jensen, 1983b).

2.2.3.3 Resource Dependence Theory

Resource dependence theory suggests that the components of corporate governance mechanisms, such as board of directors and its sub-committees, are not enough to ensure effective monitoring of managers. These mechanisms play a crucial role in connecting the company and the needed resources to increase corporate performance (Pfeffer, 1973). However, corporate governance mechanisms have essential sources that companies need. First, the board of directors and especially its independent non-executive directors have experience, expertise, knowledge and skills, which a firm needs (Haniffa and Cooke, 2002). Second, the presence of these directors builds the reputation of the firm and provides the firm with necessary business network (Haniffa and Hudaib, 2006). Third, the directors on the board have their own personal relationships, which they can use to access extra information from business and political elites (Nicholson and Kiel, 2007). Last, the board of directors is regarded as the most important link to outside resources such as creditors, suppliers, customers and institutional investors. Consequently, as Nicholson & Kiel (2007) argue, a strong relationship with outside resources has a positive impact on the corporate performance.

2.2.4 Causes of agency problems

Agency problems are a result of conflict of interest between two parties of the contractual relationship, and their characteristics are indefinite. However, the literature has focused on four elements in agency problems namely: moral hazard, earnings management, risk

aversion and time-horizon. A discussion and conclusions regarding the empirical studies are displayed in the next section in order to understand these four elements. The focus of the next section is mainly on theoretical and empirical studies that have been done in an environment where the legal protection system is powerful. This facilitates understanding the importance of investing because expropriation of investors in such an environment is generally kept down by courts. However, it seems to be more obtrusive and clear, causing high premiums for controlling ownership, which may reduce the probability of expropriation (Shleifer and Vishny, 1997, La Porta *et al.*, 1998, Denis and McConnell, 2003).

2.2.4.1 Agency problems and moral hazard

Moral hazard is one explanation of agency problems, which is offered by Jensen and Meckling (1976) in their article entitled Theory of the Firm. They propose a model and hypothesise that, in a firm where a single investor owns the company, this investor has the motivation to take private benefits, rather than reinvesting that in positive net present value opportunities, this motivation rises while his ownership in the firm declines. This assumption can be applicable to firms where the ownership structure is varied and managers do not have large stakes in their own company. This case is common in market economies such as are present in the UK and the US. Shleifer and Vishny (1989) argue that, instead of investing directly in their firms, managers can invest to increase their value to shareholders. This type of investment enables managers to reduce the possibility of being replaced and to get higher salaries and bigger perquisites for the firm. Consequently, the value of managers as individuals increases and the cost of replacing them increases as well, enabling the managers to get higher bonuses and more responsibility for the long-term.

Moral hazard conflicts can be seen more clearly and are more complicated in large firms (Jensen, 1993). Despite large companies bringing more attention to the role of external monitoring, in large companies the complication of contractual relationship grows rapidly. Consequently, monitoring management in such large companies will be more difficult and costly. Moreover, Jensen (1986) argues that in large companies such as oil companies,

moral hazard can play an important role in intensifying the free cash flow problems. In the absence of high demand for investment and presence of funds, managers may prefer to use corporate funds to get private perquisites because monitoring managers in large companies is a difficult task.

Another reason for moral hazard is a lack of effort by managers. Although it is hard to find out the impact of a lack of effort by managers, Rosenstein and Wyatt (1994) report that a firm's value declines as a result of appointing executive directors on the board of another firm. This sends signals to the market that there are directors available to take on additional responsibility.

2.2.4.2. Moral hazard

Relatively, moral hazard problems are considered less important than other theories that explain the conflicts of interest between agents and principals (Denis, 2001). Brennan (1995) states that *"a more general limitation of the moral-hazard-based theories of executive compensation is an overly stylised representation of the moral hazard problem itself as one simply of effort aversion"*. He indicates that although moral hazard may be a main concern in share-copping, preventing the pursuit of extravagant behaviour by managers or confirming that managers distribute dividends to shareholders rather than to employees or other groups, this could lead to over investing which could be more influential than perquisites of managers and may result in under investment.

Empirical evidence on the relationship between directors' remuneration has generally reported a positive relation between remuneration and firm size (See for example, Jensen and Murphy, 1990, Conyon and Kevin J. Murphy, 2000), encouraging managers to focus on size expansion rather than increase in shareholders' wealth (Jensen, 1986). Jensen also mentions conflicts of interest between shareholders and managers over dividend policies: managers prefer to keep earnings, while shareholders prefer to have high dividend, especially when the firm has low positive net present values. Since Jensen defines free cash flow as *"cash flow in excess of that required to fund all projects that have positive net*

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present values when discounted at the relevant cost of capital", managers may be willing to invest these funds in securities, or distribute them to the firm's shareholders.

It is clear that managers and CEOs can get privet benefits from retained earnings, since the growth in company size enables them to be more powerful and able to influence the board of directors and get higher bonuses (Jensen, 1986, Jensen, 1993). This situation reduces firm-specific risk and increases executive directors' job security. Shleifer and Vishny (1989) suggest that using free cash flow in manager-specific investments increases the cost of changing the incumbent managers, and enables them to derive higher bonuses and authority from the firm. Demsetz and Lehn (1985b) mention that a certain level of monitoring in the firm needs lower concentration of ownership as the size of the firm grows.

However, finance theory assumes that investors prefer to keep diversified portfolios, and therefore, earnings retention and more corporate diversification may be against their best interests. The literature has empirically reported that such plans are completely destroying investors' welfare. Lang and Stulz (1994) and Berger and Ofek (1995) document that firm value of a firm operates in multiple areas of business is lower than actual value of the component parts of each business unit. Lang, Poulsen and Stulz (1995) argue that management sells assets in order to provide cheap funds to continue its aims rather than working for efficiency reasons alone. Their conclusions reveal that such transaction has a significant positive reaction on stock price if the proceeds are planned to be paid out, but this reaction is significantly negative if the proceeds are retained. Denis, Denis and Sarin (1997) find that there is high probability for firms that reverse their diversification strategies to have negative excess values, compared to market firm value of their countraparts. In general, empirical findings suggest that shareholders' wealth can be damaged by managerial discretion in managing cash flow.

Morck, Shleifer and Vishny (1990) investigate the acquisitions of 326 US firms between 1975 and 1987 and find that firms' managers may drive acquisitions to fulfil their own purposes, which reduces the bidding firms' values. These acquisitions reduce the firms' value by resulting negative share price reaction on the date of acquisition announcement.

Generally, when managers make acquisition or any other investment, they take into account their personal benefits and the impact of those transactions on the firm's value. If managers get large personal benefits, they will be willing to ignore the firm's value in order to pursue that investment. Moreover, managers overpay for target firms if they get benefits, even though the net present value of the target firm is low.

In addition, earnings retention decreases the demand for external fund for new investment projects. However, in spite of the probable costs of issuing new capital (About these costs, see for example, Jensen and Murphy, 1990, Conyon and Kevin J. Murphy, 2000), the markets monitor and adjust the level of risk taken by management and investors (Easterbrook, 1984). Moreover, earnings retention could be one motivation to management to take value-maximising decisions, which are needed by shareholders and other stakeholders.

2.2.4.3 Horizon problem

One reason for agency conflicts between managers and shareholders may be the timing of cash flows. It is expected that shareholders and other stakeholders are concerned about the future cash flows of their firms, since these cash flows have an impact on the share prices. On the other hand, managers may be concerned about the future cash flows only during their employment term. This situation could lead to a bias in objectives of short-term investments, resulting in high return from expenses of long-term positive net present value projects. This problem obviously appears when the top managers reach the final years before their retirement, or they have planned to leave the firm.

Dechow and Sloan (1991) argue that, because retirement benefits depend on the compensation received in later years, chief executive officers in their final years reduce the R&D expenditures to improve short-term performance and, as a result, they can get more compensation in these years. The authors examine the changes in R&D expenditures for firms that have crucial ongoing R&D projects. Their findings show that CEOs reduce R&D during their final years, but this reduction can be mitigated by CEO ownership. They find no evidence that the reduction in R&D is associated with poor firm performance. The

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horizon problem may affect the managers' decision-making process since, as their compensation depends on earnings-based bonuses, they may select accounting practices to increase earnings in order to improve performance before their departure (Healy, 1985).

Nevertheless, any effort to examine these accounting practices is difficult since managers have motivations to reduce and increase earnings because of both earnings management and poor corporate performance associated motivations. Pourciau (1993) investigates the relation between non-routine CEO turnover and discretionary accounting practices, namely: earnings, accruals, cash flows, and special items and write-offs. Her findings indicate that incoming managers decrease earnings in the year of the executive turnover and increase earnings the next year, and record large write-offs and special items the year of CEO turnover. In contrast, departing CEOs decrease earnings by accruals and write-offs during their last year of tenure. Murphy & Zimmerman (1993) investigate changes in discretionary accounting practices, namely: R&D, advertising, capital expenditures, and accounting accruals surrounding CEO departures due to poor performance. They find that changes in these practices occur due mostly to poor performance rather than attempts from managers to manage earnings. On the other hand, Dechow and Sloan (1991) find no evidence that managers attempt to manage earnings in the final years before their retirement.

2.2.4.4 Managerial risk aversion

Another area of conflict between managers and shareholders is managerial risk-taking behaviour, which comes as a result of portfolio diversification restraint. Fama (1980) argues that "*the managers of a firm rent a substantial lump of wealth - their human capital - to the firm, and the rental rates for their human capital signalled by the managerial labour market are likely to depend on the success or failure of the firm*".

However, individual investors and managers behave in a similar way when they wish to diversify their own portfolio in the company that employs the managers. The difference between individual investors and managers is that individual investors are concerned about systematic risk, whereas managers are concerned about systematic risk and firm-specific

risk. Denis (2001) comments that the human capital of managers is tied up in the company that employs them, so they stand to lose much more than other investors if a project fails. This leads to possible conflicts of interest about investment policies. In other words, individual investors have a simple investment policy, which is to invest in all positive net present value projects; whereas managers evaluate the possibility of failure because they have more to lose than do individual investors. Therefore, managers may invest in projects that minimise the risk to their firm's value (Jensen, 1986).

Himmelberg, Hubbard & Palia (1999) support this meaning: they examine the relationship between director ownership and performance by using panel data, and they report that the higher is the firm's idiosyncratic risk, the lower is optimal director ownership. Demsetz and Lehn (1985b) state that *"normal risk aversion implies that they will purchase additional shares only at lower, risk-compensating prices. This increased cost of capital discourages owners of larger firms from attempting to maintain highly concentrated ownership"*. Benson and Davidson III (2009) find similar findings: that low levels of director ownership have an incentive alignment effect, but high levels cause a risk aversion effect.

The risk aversion conflict can be clearly noticed when executive managers are paid a large fixed salary or, in the case of specific required skills, cannot be transferred to another company. Furthermore, making decisions to invest in risky projects could lead eventually to the probability of bankruptcy, which damages managers' human capital and deprives them from other job opportunities. For instance, Gilson (1989) finds that managers in firms that experience financially distress or poor performance and lost who their jobs as a result, are not employed by another listed company for at least three years. The impact of risk aversion extends to affect a company's financial policies. In the literature it is known that higher debt can play a role in reducing agency problems (Jensen, 1986), and creates corporate tax shields (Myers, 1984). However, Brennan (1995) argues that managerial risk aversion requires equity financing since debt enhances the probability of default and bankruptcy.

Corporate governance mechanisms have been recommended to mitigate the agency problems and attempt to align the interests of managers with the best interest of shareholders. The development of corporate governance regulations is an important area which cannot be ignored, especially in the UK, because it is the first country in the world to start the initiative of developing the corporate governance system. The next section presents the developments of corporate governance regulations in the UK.

2.3 Corporate Governance in the United Kingdom

After dissection of the main two concepts of corporate governance, it is essential to know the stages of corporate governance development in the United Kingdom, since this study aims to find out the impact of corporate governance on corporate performance. The UK is considered an international leader of corporate governance development and reform, and its main concept focuses on shareholders. The voluntary approach of corporate governance in the UK has been supported, especially after the collapses of high profile firms in the US and the UK. The first attempt to reform the corporate governance system was initiated by Cadbury in 1992. He stated that principles of best practice in the UK depend on the voluntary approach, which listed companies should follow or justify if they do not follow it. The Cadbury Report in 1992 is considered the backbone of the work of all committees and reports that were published after it.

Solomon and Solomon (2004) indicate a number of reasons that improved the practice of corporate governance in the UK include increase of the institutional investors such as pension funds and insurance companies; issuance of Company Law, which introduces more fiduciary responsibilities on the board of directors; the establishment of the Financial Services Authority, which is responsible for the requirements of corporate governance in the UK; the legal requirements of independent external auditors; and the London Stock Exchange Code and Companies Act regarding share dealing and transactions by directors. Despite it being generally accepted that these aspects have affected the improvement in the codes of best practice on corporate governance, there is a consensus that the developments in the corporate governance codes are as a result of financial scandals in the UK as well as in other countries.

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2.3.1 The Cadbury Report (1992)

The publication of the Cadbury Report in 1992 is deemed the first attempt to formalise the corporate governance mechanisms in the UK. The report depended on the existing practices of corporate governance of UK listed firms, since they were clear; and the report was only emphasising what is good practice and could improve the governance of firms. The recommendations of the Cadbury Code adopted the voluntarily approach, since any company can chose which mechanism can adopt, but they have to justify their reasons if they do not follow the recommendations. However, despite the fact that compliance with the report was optional, it is clear that the majority of UK listed firms have adopted the recommendations because they are required by the London Stock Exchange.

The focus of the Cadbury Report was mainly on three tools of governance. First, the report sets the requirements of the board of directors as the main and most important mechanisms of corporate governance. Second, the report concentrates on disclosure and transparency, and the role that accounting and auditing practice can play in this regard. The final area to which the Cadbury Report draws attention is the role of institutional investors as large shareholders who can control and change the directors through the voting procedure, and contribute to the decision-making process. The rest of the report's recommendations concentrate on the role of board subcommittees such as the audit committee, and emphasising that different individuals should occupy the roles of CEO and board chairman.

2.3.2 The Greenbury Report (1995)

In 1995 the Greenbury Report was published as a consequence of concerns from the public and shareholders about the excessive remuneration of executive directors in the UK. The report was an attempt to create a link between remuneration and corporate performance. Greenbury recommends that more disclosure regarding the remunerations should be available in the annual reports, and that listed firms should establish a remuneration committee comprised entirely of independent non-executive directors. Further, the report requires the listed firms to disclose in their annual report details of the members of the remuneration committee; information on the basic salary of the directors on the board of

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directors and its subcommittees; bonuses, shares and options hold by directors; and the pension scheme of the directors.

2.3.3 The Hampel Report (1998)

The Hampel Report (1998) was a review of the impact of both the Cadbury Report (1992) and the Greenbury Report (1995). Hampel focuses on the important role of institutional investors in corporate governance, especially the pension funds, since they were accused of investing for the short term and thereby putting pressure on companies' directors to adopt strategies of short-term profitability rather than concentrating on the long-term corporate performance. The consequence of the Hampel Report was the publication of the Combined Code on Corporate Governance by the Financial Reporting Council in 1998, which decides the corporate governance mechanisms of UK listed firms. The Code continues to use the voluntarily approach, which depends on 'comply or justify', in contrast to the US governance approach, which adopts the legal requirements. The Code was the main motivation of the Myners Report (2001), which aims to empower the role of institutional investors, especially pension funds, in corporate governance.

Solomon and Solomon (2004) criticise the provisions of the Combined Code, as they take into account the interests of the directors more than those of the shareholders. They believe that the Hampel Report ignores the important role of accountability to shareholders by focusing on the prosperity of companies more than their accountability. Hampel states that *"The importance of corporate governance lies in its contribution both to business and prosperity and to accountability. In the UK the latter has preoccupied much public debate over the past few years. We would wish to see the balance corrected. Public companies are now among the most accountable organisations in society ... We strongly endorse this accountability and we recognise the contribution made by the Cadbury and Greenbury committees. But the emphasis on accountability has tended to obscure a board's first responsibility to enhance the prosperity of the business over time".* The collapse of high profile companies such as Enron has provided anecdotal evidence on the importance of accountability, which is the downside of the Hampel Report.

2.3.4 The Combined Code (1998)

In 1998 the first Combined Code Principles of Good Governance and Code of Best Practice was published, derived from the Cadbury, Greenbury and Hampel reports. It contains two parts: the first one is for listed companies, and the second one is for institutional investors. The code uses the 'comply or justify' approach, since the UK listed firms have to explain in their annual report whether or not they have complied with the code. Regarding the internal control system, in section D.2 the code states that *"The board should maintain a sound system of internal control to safeguard shareholders' investment and the company's assets"*. It requires the directors to review the internal control, stating *"The directors should, at least annually, conduct a review of the effectiveness of the group's system of internal control and should report to shareholders that they have done so. The review should cover all controls, including financial, operational and compliance controls and risk management"*. In 1999, the Turnbull Report was published to form a clear guide for directors about how to conduct this review.

2.3.5 The Turnbull Report (1999)

Following the publication of the Combined Code on 1998, the Turnbull Report was published on 1999 as a review of the internal control and reporting system in the Combined Code. In line with prior committees, it adopts the 'principles' approach, which depends on the voluntarily compliance of listed firms. Turnbull was a response to concerns about the internal control system and risk management. It provides recommendations for directors to discharge their responsibilities in controlling firms and ensuring the quality of the financial reporting system in the light of the Combined Code provisions. Turnbull requires listed firms to disclose information about their procedures for internal control. It states that *"the board should, as a minimum, disclose that there is an ongoing process for identifying, evaluating and managing the significant risks faced by the company, that it has been in place for the year under review and up to the date of the approval of the annual report and account"*. However, both directors and investors have indicated that the Turnbull Report has generally improved risk management and internal control (Turnbull, 2005).

The Turnbull Report is considered the first initiative in the UK to establish a guideline on the internal control reporting system. However, although the report requires more disclosure about risk management system in firms, it did not recommend clear recommendations for directors to be more specific about a firm's cash flows and associate this to risk management. Page and Spira (2004) investigate the impact of the Turnbull Report's recommendations on the internal audit departments in FTSE 350 companies. Their findings indicate that the Turnbull Report is reviewed by internal auditors as beneficial to their cause and it helped them to be more aware of internal audit in a positive perspective. This results in operating departments frequently requesting internal audit consultations when implementing new or modified procedures. However, the Turnbull Report has required listed firms to disclose an opinion on the influence of internal controls, but neither the managers nor the auditors have been agreeable about taking responsibility for this disclosure. Page and Spira (2004) show that there are different interpretations for some terms that Turnbull has used such as "risk management", "review" and "assessment". Consequently, these different interpretations create difficulties in understanding how to disclose information about risk management and to what extent this kind of information is useful for investors.

2.3.6 The Myners Report (2001)

The Myners Report was published by HM Treasury in 2001, and its main focus is on institutional investment in response to the government's concern that institutional investors mainly invest in quoted equities and gilts, avoiding investments in small and medium sized companies. Myners concentrates on the trusteeship aspects of institutional investors, aiming to raise the standards and encouraging the shareholders to be more active in protecting their investments, especially in underperforming firms.

2.3.7 The Higgs Review (2003)

After a series of scandals in high profile companies in the US such as Enron and WorldCom in the summer of 2001, due to poor corporate governance practices, investors lost their confidence in companies. In response to pressure from media and investors, in

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April 2002 the British government formed an independent committee chaired by Derek Higgs. His main task was to review the status quo and make any recommendations to the government and other related parties. Mainly he was asked to evaluate the contribution of non-executive directors in the UK, their independence, effectiveness, relationship with investors, remuneration, and the role of the Combined Code. Alongside Higgs' committee, the Co-ordinating Group on Audit and Accounting Issues formed a committee chaired by Sir Robert Smith to review audit and accounting practises and issue guidance for audit committees in the UK. Both Smith and Higgs published their reports on 20th January 2003 (Higgs, 2003, Jones and Pollitt, 2004, Corley, 2005).

The Higgs' recommendations focus mainly on the role of non-executive directors on the board of directors, their appointment, resignation, remuneration, responsibilities and relationship with shareholders (Higgs, 2003). His recommendations support the Combined Code, with some additional changes. He recommends that the disclosure of annual reports should include the number of meetings held by the board and its sub-committees; the role of CEO and board chairman should be separated; at least once a year the non-executive directors should hold a meeting without the presence of executive directors; a training programme should be developed for individuals to be future directors; the shareholders should be informed about the appointment of new independent non-executive directors and its procedure; an induction programme should be given to new non-executive directors; an assessment of the performance of the board and its sub-committees should be conducted at least once per year; a non-executive responsibility or a chairmanship of a main company should not hold by a full-time executive director; and a non-executive director should not be a member of all board sub-committees (Higgs, 2003). These recommendations were adopted by the Combined Code in 2003 (Financial Reporting Council, 2003).

2.3.8 The Smith Report (2003)

The Smith Report was a response to calls for more corporate governance reform, especially after the collapse of Enron in the US. The Smith Report's main concern was the framework for audit committees and the relationship between external auditors and firms. The main task of an audit committee is to monitor the integrity of the financial reporting system and

review the internal control system of a company. Smith recommends that every listed company should establish an audit committee of at least three independent non-executive directors, at least one of them with recent and relevant financial experience. Smith recommends audit committees to have not less than three meetings during the year. The report emphasises that the audit committee should monitor the external auditors to ensure they are independent and impartial. Solomon and Solomon (2004) indicate that the Smith Report should have not been specific in differentiating between consulting and auditing services by the same external auditor ,which can negatively affect the independence of the external auditor.

The publication of the Higgs Report and the Smith Report and their recommendations led to publication of an updated version of the Combined Code on Corporate Governance in 1998. In 2004, the Financial Reporting Council formed the Turnbull Review Group to review the effectiveness of the guidance of disclosures and decide whether Turnbull's recommendations of 1999 needed to be amended to reflect the recent changes. The group found that the Turnbull Review of 1999, which was based on the 'principles' approach, has contributed to the development of risk management and internal control system since its publication. This, however, does not mean that *"there is nothing new for boards to do or that some companies could not make more effective use of the guidance ... no such system remains effective unless it develops to take account of new and emerging risks, control failures, market expectations or changes in the company's circumstances or business objectives"* (Turnbull, 2005).

2.3.9 The Combined Code

In July 2003, the Financial Services Authority replaced the Combined Code of 1998 by publishing a revised vision of it. It also contains the recommendations of the Higgs Review (2003) and Smith Review (2003), and was applied on 1st November 2003. However, unlike the recommendation of the Higgs Review (2003), which suggests *"A full time executive director should not take on more than one non-executive directorship, nor become chairman, of a major company"*, the Code requires *"The value of ensuring that committee membership is refreshed and that undue reliance is not placed on particular individuals*

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should be taken into account in deciding chairmanship and membership of committees".
The Code also defines in more detail the role of chairman and the senior independent
director, stating that "*the chairman is responsible for leadership of the board, ensuring its
effectiveness on all aspects of its role and setting its agenda ... the non-executive directors,
led by the senior independent director, should be responsible for performance evaluation
of the chairman, taking into account the views of executive directors*". Furthermore. it
requires that at least half the board should be independent non-executive directors.

However, the Financial Reporting Council continues to publish updated versions of the
Combined Code. It issued an updated version in June 2006, then June 2008, and the latest
one was published in June 2010. Relatively, it could be said that there is no dramatic
change or requirement in these versions, but more details about the previous requirements
have been added. The updated versions of the code still follow the 'comply or explain'
approach, with the emphasis mainly on the role of the board and its chairman and CEO.
The Code of 2010 states that "*The chairman is responsible for leadership of the board and
ensuring its effectiveness on all aspects of its role ... The board as a whole has
responsibility for ensuring that a satisfactory dialogue with shareholders takes place*".
Regarding the role of CEO, the Code continues to require separation between the role of
CEO and that of board chairman.

2.4 The Impact of Corporate Governance on Corporate Performance

The literature has suggested that the agency problems can be mitigated by following good
practices of corporate governance. In addition, prior corporate governance studies have
intensively investigated the impact of corporate governance structure on corporate
performance. These studies have mainly focused on examining corporate governance by
investigating each mechanism alone or measuring the level of compliance with corporate
governance regulations by developing an index. This section conducts a discussion about
the theoretical background of both models and reviews the empirical studies. In addition, it
will also explain the development of corporate governance in the UK since the publication
of the Cadbury Report in 1992.

Examining the impact of each corporate governance mechanism in isolation suggests that corporate governance mechanisms have an endogenous association with corporate performance (e.g., Agrawal and Knoeber, 1996, John and Senbet, 1998). It also presumes there is an optimum corporate governance system, and every company should be free to select its own system without outside interventions, so the corporate governance mechanisms are internally determined (e.g., Danielson and Karpoff, 1998). Consequently, a company is expected to create its own corporate governance system that achieves a balance between the cost of corporate governance system and corporate performance (e.g., Agrawal and Knoeber, 1996, Himmelberg et al., 1999). For example, the establishment of an audit committee in a firm may increase the quality of financial reporting system and the firm's value, but this may not be the case in another firm due to the differences in industry, ownership concentration, and firm size, amongst other reasons. This assumption was the popular corporate governance approach in the past (e.g., Baysinger and Butler, 1985, Demsetz and Lehn, 1985a), specifically before the publication of corporate governance best practices codes around the world during 1990s (e.g., Danielson and Karpoff, 1998, Black et al., 2006c, Aguilera and Cuervo-Cazurra, 2009).

Another trend of corporate governance studies is that they have focused on the level of compliance with corporate governance regulations. They have developed their own governance index which has been used in the early 2000s as a result of the variety of corporate governance codes around the globe (e.g., Black, 2001, Gompers et al., 2003, Morey et al., 2009). The main assumption of the governance approach is that companies seem to select their corporate governance system as a set from corporate governance codes (e.g., Danielson and Karpoff, 1998, Padgett and Shabbir, 2005). In particular, it suggests that corporate governance mechanisms and other interactive factors are likely to affect corporate performance as a group rather than as independent mechanisms. As a result, studies used this approach examine the relationship between corporate governance and corporate performance by constructing a governance index that includes all corporate governance mechanisms as a group, instead of examining the impact of every mechanisms in isolation (e.g., Gillan et al., 2003, Gompers et al., 2003, Beiner et al., 2006, Bebchuk et al., 2009).

Prior corporate governance studies, as will be mentioned in more detail later in this chapter, have mainly focused on one approach, either investigating each corporate governance mechanism in isolation, or using an index (e.g., Agrawal and Knoeber, 1996, Beiner *et al.*, 2006). This study attempts to develop its own governance index as well as examining the characteristics of the board of directors. A discussion will be conducted in the next subsections about the governance index and each characteristic of the board of directors.

This study examines the relationship between corporate governance and corporate performance for UK listed firms over an eleven-year period. It focuses on investigating the impact of level of compliance with corporate governance regulations on performance. Additionally, it examines the core of the corporate governance system which is the board of directors. The next sections discuss the literature and the findings of prior corporate governance studies.

2.4.1 The Corporate Governance Index

Using the corporate governance index is considered a significant movement from the typical approach of examining each corporate governance mechanism in isolation towards a new era of corporate governance research approach. The corporate governance index assumes that corporate governance is likely to be affected by corporate governance mechanisms as a set rather than to be independently affected by each mechanism (e.g., Gompers *et al.*, 2003, Padgett and Shabbir, 2005, Beiner *et al.*, 2006, Black *et al.*, 2006b, Larcker *et al.*, 2007). Therefore, instead of separately investigating the impact of each corporate governance mechanism, the index suggests an inclusive structure of provisions of corporate governance code to measure the effectiveness of corporate governance on corporate performance. This section discusses the results of prior studies that have used the index in their examination.

The first attempt to use the governance index to find out the relationship between corporate governance and corporate performance has been conducted by Gompers et al. (2003). They investigate how shareholder rights vary across companies and their influence on corporate

governance in 1500 US firms per year from 1990-1998. They use 24 corporate governance provisions to build a non-compliance index as a measure of shareholder rights' level. Their findings show that there is a positive relationship between strong shareholder rights and corporate performance measured by Tobin's Q and higher accounting profits. They also find stronger shareholder rights are positively associated with sales growth, and negatively associated with capital expenditure and corporate acquisitions.

Cremers and Nair (2005) use the non-compliance index of Gompers et al., (2003) to investigate how the market for corporate control shareholder activism interacts in US firms. Their findings support the findings of Gompers et al., (2003), that companies with better corporate governance system have higher share returns and firm value than other companies. Likewise, Bebchuk et al., (2009) examine the relative importance of the twenty four provisions of the corporate governance code that are used by Gompers et al., (2003) by using a longer period of time - from 1990 to 2003. Their findings demonstrate that there is a significant negative relationship between the level of non-compliance corporate governance index and firm value, computed by Tobin's Q and abnormal stock returns. This conclusion has been supported by a number of studies which have found empirical support for Gompers *et al.,* (2003) in the US and other countries (Gillan *et al.*, 2003, Larcker *et al.*, 2004, Aggarwal *et al.*, 2007, Chhaochharia and Grinstein, 2007, Bruno and Claessens, 2009).

In contrast, it has been suggested that the validity of previous US studies which found a relationship between corporate governance indices and corporate performance is questionable (Core *et al.*, 2006, Bhagat and Bolton, 2008). Core, Guay, and Rusticus (2006) re-examine the conclusion of Gompers *et al.,* (2003) that weak shareholder rights' experience is significantly related to stock market underperformance, using takeover activity as a control variable. They do not accept that a poor corporate governance system is associated with poor stock returns. Similarly, Bhagat and Bolton (2008) report that there is no significant relationship between the corporate governance index of Gompers et al. (2003) and corporate performance in a sample of US listed firms.

However, the tendency of empirical evidence seems to be consistent of a positive relationship between corporate governance indices and corporate performance in emerging markets. Black (2001) investigates the relationship between corporate governance ranking created by the Russian Investment Bank, which is based on 60 provisions, and corporate performance for 21 Russian quoted companies in 1999. His findings show that the corporate governance ranking is statistically significantly positively associated with firm value. The findings of Black are based on a small sample - only 21 firms - and the interaction between legal and cultural and the companies is weak.

Henry (2008) constructs a compliance composite corporate governance index from eight provisions of the Australian Stock Exchange requirements and examine its impact on corporate performance for 116 Australian quoted firms over the period from 1992 to 2002. His findings reveal that there is a statistical significant and positive relationship between the index and corporate performance, measured by Tobin's Q. This result has been supported by a number of studies in different counties such as Baek, Kang, and Park (2004), and Black, Jang, and Kim (2006b) in South Korea; Black, Love and Rachinsky (2006c) in Russia; Cheung, Thomas Connelly, Limpaphayom, & Zhou (2007) in Hong Kong; Cui, Evans, and Wright (2008) in Australia; and Garay and Gonzalez (2008) in Venezuela; which have indicated that compliance with corporate governance codes of best practice is likely to be associated with higher corporate performance.

Beiner *et al.,* (2006) examine the impact of a compliance corporate governance index on corporate performance in 109 Swiss listed firms in 2002. They use 38 corporate governance provisions of the Swiss Corporate Governance Code to build the index and divide the provisions into five groups, namely: board of directors, shareholders' rights, corporate governance commitment, transparency, and auditing. Their compliance index is based on giving one point for each company that complies with any of the 38 provisions, which means a firm with complete compliance is given 38 points and zero for complete non-compliance. Consistent with prior studies, their findings show that the governance index is positively associated with corporate performance measured by Tobin's Q.

In the UK, and in Europe generally, the empirical studies that have investigated the impact of corporate governance indices and corporate performance are limited compared with US studies (Bauer *et al.*, 2004). Bauer *et al.*, (2004) examine the impact of a corporate governance index on common stock returns and firm value in the FTSE Eurotop 300, including the UK, over the period 2000 and 2001. They use the corporate governance ratings of Deminor, which rates most firms in the FTSE Eurotop 300 and covers about 300 different governance criteria in each company, as their corporate governance index. Their findings show almost no significant relationship between the index and corporate governance measured by market and accounting measures, with even some level of a negative association.

However, the findings Bauer *et al.*, (2004) have been criticised in that corporate governance mechanisms are largely determined by country-specific factors (Renders and Gaeremynck, 2006). In addition, it has been suggested that corporate governance mechanisms and structure are different from country to country (Aguilera and Cuervo-Cazurra, 2009, Filatotchev and Boyd, 2009). Thus, using standard corporate governance ratings, such is the corporate governance ratings of Deminor, does not represent legal systems, regulations, or cultural and other differences in corporate governance mechanisms across different countries. This suggests that standard ratings are not able to show the impact of the provisions of corporate governance codes on corporate performance in each individual country. In addition, cross-country studies generally suffer from sample bias, since they usually use companies ranked by analysts, and these rankings seem to be biased to large companies (Botosan, 1997, Hassan and Marston, 2010b).

Using 245 UK non-financial firms in the FTSE 350 index over the period from 1998 to 2003, Arcot and Bruno (2007) build a corporate governance index based on eight provisions of the corporate governance code, and examine its relationship with corporate performance measured by return on assets. Interestingly, they find that firms that shift from compliance with the combined code outperform other companies, as performance is measured by return on assets. Further they argue that *"mere adherence to general accepted*

principles of good corporate governance is not necessarily associated with superior performance".

In contrast, Padgett and Shabbir (2005) build a non-compliance index based on 12 corporate governance provisions and investigate the relationship between the index and corporate performance as measured by total share return in 120 UK non-financial listed companies over the period from 2000 to 2003. They find an inverse relationship between the index and corporate performance. This suggests that more compliance with the combined code leads to higher total share return. However, the sample of Padgett and Shabbir (2005) includes only active companies, which makes their study suffer from a survivorship bias. Further, because their sample covers the period from 2000 to 2003, they ignore considerable changes that happened during 2003, which are the publication of Higgs and Smith Reports, and the adoption of the recommendations of these reports in the Combined Code of 2003 and its subsequent versions.

This study attempts to overcome these previous studies' limitations by taking different steps. First, as will be explained in Chapter Three, this study avoids the sample bias by selecting a large sample that includes listed and delisted, large and small companies over an eleven-year period of time. Second, unlike previous corporate governance studies, the sample size of this study is quite large, more than 400 companies. This increases the possible generalisation of the findings. Third, this study addresses the problem of endogeneity directly, as will be explained in Chapter Three. Fourth, the corporate governance index used in this research is more comprehensive than that used in prior studies in the UK. It includes aspects which were not taken into account by prior studies, such as the number of meetings held by audit committees and whether there is at least one financial expert on the audit committees. Finally, since the impact of corporate governance systems may arguably need time to become apparent, this study investigates the impact of corporate governance on corporate performance for an eleven-year period. Therefore, the impact of corporate governance may be accurately captured in this study. These improvements in this study may develop more understanding of corporate governance generally, and in the UK in particular.

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As will be explained in Chapter Three, the governance index of this study includes 15 provisions of the corporate governance code. The general expectations from complying with the Combined Code on Corporate Governance provisions are to reduce agency costs and improve corporate governance. These expectations are consistent with what agency theory has suggested. Furthermore, managerial signalling theory indicates that complying with the code of corporate governance is a primary sign by management to markets that the management follows better corporate governance structure. This can lead to an increase in the demand for shares by investors, which means an increase in the wealth of the shareholders. Consequently, it is expected that companies that adopted the recommendations of the combined code are likely to have higher corporate performance than other companies that have not done so.

2.4.2 The Characteristics of the Board of Directors

Corporate governance mechanisms aim to mitigate agency problems and ensure that managers act in the best interests of shareholders (e.g., Jensen and Meckling, 1976, Fama, 1980, Netter *et al.*, 2009). The most important component of any corporate governance system is the board of directors (Lipton and Lorsch, 1992, John and Senbet, 1998, Filatotchev and Boyd, 2009). The main task of the board is to monitor the managers and ensure that a firm's obligations to shareholders and others are met. This means that the board of directors' role is to advise managers, set the strategy plans, ensure the optimal use of resources, and supervise management; and it is accountable to shareholders for its role (Demsetz and Lehn, 1985a, Brennan, 2006). However, in order for the board of directors to fulfil its responsibilities, it has to be effective and efficient when it carries out its tasks (Jensen, 1993, Brennan, 2006). Empirical studies have suggested that there are several variables that effect the board of directors' performance, such as presence of independent directors, size of the board, and experience of directors, amongst others (e.g., Yermack, 1996, Baranchuk and Dybvig, 2009).

Consistent with prior corporate governance studies, the next subsections review the findings of corporate governance mechanisms that have been reported to be influential in corporate performance. These variables include the proportion of non-executive directors

on the board, size of the board of directors, whether the role of CEO and chairman are occupied by one individual (duality), director shareholdings, and the existence of board sub-committees. The review of each variable will be conducted in three parts. First, a theoretical and an empirical review of the relationship between corporate governance and corporate performance will be discussed. Second, the related provision of the Combined Code on Corporate Governance in the UK will be described. Finally, according to the review, the hypotheses will be extracted from the discussion.

2.4.2.1 The Board Processes

It has been suggested that board of directors should be generally active and its members should participate in decision making (Scherrer, 2003). In general, little has been done to practically measure the participation of directors on decision making process. Strebel (2004) suggests that board of directors has mainly four tasks to performance, which are to audit, coach, steer and supervise. He adds these four tasks depend on four key factors that board perspective, board behaviour, internal circumstances and external circumstances. It is expected that the board will be an auditing tool if management is effective and insignificant externalities are involved, a coaching tool if management is ineffective and for short-term, a steering tool if board is involved in executive tasks for long-term, and a supervising tool if board assumes a monitoring tasks and externalities are considerable.

Similarly, Pearce and Zahra (1991) mention four sorts of board of directors according to power of the CEO. First, a caretaker board that have low power and its CEO has low power as well. Second, a statutory board that has low power as a board, but its CEO has high power, and in such this case the board is lack of independence and expertise. Third, a proactive board that deemed the ideal board as it has more power than its CEO. Finally, a participative board that the board and its CEO both have high power, and usually the board is well informed and takes quick decision. Likewise, Pye and Camm (2003) defines four important duties for independent non-executive directors on the board, which are consultant, auditor, supervise executive directors and tame pensioner, these duties depend on how effective non-executive directors were in strategic and management contribution.

Furthermore, Van Ees *et al.* (2009) initiate the first attempt to develop a behavioural theory of boards that concentrates on the interactions and behavioural process among different parties in and around the board of directors. Employing a behavioural approach, a limited number of empirical studies have already been conducted. Gabrielsson and Winlund (2000) and Gabrielsson (2007) suggest that board involvement is a crucial determinant of board task performance. Other board processes like cognitive conflict (Zona and Zattoni, 2007, Minichilli *et al.*, 2009), effort norms (Zona and Zattoni, 2007), background diversity (Minichilli *et al.*, 2009), knowledge and skills (Zona and Zattoni, 2007, Van Ees *et al.*, 2008) and commitment (Minichilli *et al.*, 2009) are deemed to be of influence on the board process.

However, it is worth mentioning that the board process is beyond the scope of this study. Also, investigating the board process needs to be conducted by using primary data and this study only uses secondary data to examine certain characteristics of the board. Next subsections will focus on the main characteristics of board of directors, liking those characteristics to corporate performance.

2.4.2.2 Non-Executive Directors

The literature has suggested that, in order to reduce agency problems and mitigate information asymmetry, more independent non-executive directors (NEDs) should be appointed to the board of directors (e.g., Fama, 1980, Lipton and Lorsch, 1992, Jensen, 1993). This variable is measured as the percentage of NEDs on the board to the total number of directors on the board. However, having more NEDs is a desirable aspect of corporate governance on one hand, but having more executive directors is a desirable aspect of corporate governance on the other hand. The argument of having more NEDs is based on agency theory, information asymmetry, and resource independence. Agency theory suggests that domination of executive directors on the board makes the board less accountable (e.g., Fama, 1980, Sonnenfeld, 2002), whereas the presence of NEDs makes the board more independent in its decisions, and bring more skills, expertise, experience and business network contacts (Haniffa and Hudaib, 2006, Baranchuk and Dybvig, 2009).

NEDs' reputation and performance are monitored by labour markets, which encourages them to provide professional work (Fama, 1980, Fama and Jensen, 1983b).

However, Fama (1980) argues that when the executive directors dominate the board, there is a likelihood that they may decide collusion and expropriation of security holder wealth are better than competition among themselves. Additionally, Fama suggests that any possible collusion by directors on the board can be minimised by having more NEDs on the board. Jensen (1993) suggests that the independence of NEDs enables them to criticise the management without any hesitation or fear of being fired. Furthermore, it has been suggested that appointing independent NEDs is considered as a credible signal to the market that the intention of the company is to treat its shareholders fairly and to apply good corporate governance practices (Black *et al.*, 2006c). It is also considered as a signal to investors and shareholders that the company has the required skills and expertise to make its decisions ,and make its control system more functional (Fama and Jensen, 1983b). Consequently, a high proportion of NEDs on the board of directors is likely to improve corporate performance and firm value.

In addition, based on stewardship theory, it has been argued that boards of directors that are dominated by NEDs are likely to have a negative impact on corporate performance (Baysinger and Hoskisson, 1990, Weir and Laing, 2000, Bozec, 2005). Weir and Laing (2000) argue that usually the knowledge of NEDs is less than that of executive directors, and NEDs face many difficulties in understanding the complex operations of the firm. This problem may arise because NEDs are generally part-time and they usually have directorship in other firms (Bozec, 2005, Jiraporn *et al.*, 2009). This means that NEDs do not have enough time to spend monitoring executive directors and to discharge other responsibilities.

In contrast, a high percentage of NEDs on the board is associated with easy access to all information required to make accurate and high quality decisions, which can positively affect corporate performance (Nicholson and Kiel, 2007). Importantly, NEDs may not have the same ability to access information and knowledge from their informal sources as executive directors have. Therefore, a board of directors that is dominated by NEDs might

not be able to make the same high quality decisions compared to a board dominated by executive directors. Additionally, it has been argued that having a high percentage of NEDs on the board may repress strategic plans and engulf the firm in excessive managerial monitoring (Goodstein *et al.*, 1994, Haniffa and Hudaib, 2006).

Given the conflicting impact of NEDs on corporate performance, the empirical evidence about this issue is mixed. A considerable number of empirical studies have reported that boards of directors that are dominated by NEDs have a positive impact on corporate performance. Weir *et al.* (2002) investigate this issue in 311 UK listed companies over the period 1994 to 1996 and document that proportion of NEDs is positively associated with corporate performance measured by Tobin's Q. Furthermore, Gupta and Fields (2009) examine the board members' resignations announcements and their perceived importance in the context of firms' existing governance structure from 1990 to 2003 in 744 US firms. Their findings report that the announcement of independent NED resignations causes a 1.22% reduction in firm value. This suggests that the markets assess the independence of board of directors according to the percentage of independent NEDs, since they are likely to be associated with more monitoring of managers.

In contrast, a considerable number of corporate governance studies have found a negative impact of the proportion of NEDs on corporate performance (e.g., Agrawal and Knoeber, 1996, Yermack, 1996, Laing and Weir, 1999, Bozec, 2005). Likewise, Bhagat and Black (2002) report that US firms with a high percentage of NEDs do not perform better than other firms. This may mean that, although having more NEDs can improve the independence of the board, skills and expertise, it may also repress the entrepreneurial initiatives of directors by imposing excessive monitoring by NEDs.

A third strand of empirical evidence has indicated that having more NEDs on the board has no impact on corporate performance (e.g., Vafeas and Theodorou, 1998, Weir and Laing, 2000, Haniffa and Hudaib, 2006). For instance, Hermalin and Weisbach (1991) examine the relationship between board of directors' structure and corporate performance in 142 US firms. They report that there is no relationship between board composition and corporate performance. In the UK, Vafeas and Theodorou (1998) find no significant relationship

between board structure and corporate performance in 250 UK listed companies. Weir and Laing (2000) investigate the relationship between the recommendations of the Cadbury Report and corporate performance in 200 UK listed companies over the period from 1992 to 1995. Their findings indicate that the presence of NEDs does not have an impact on corporate performance. In addition, Haniffa and Hudaib (2006) document no statistical significant relationship between the presence of NEDs and corporate performance in 347 Malaysian quoted companies.

As has been mentioned in Chapter Two, the Financial Services Authority is responsible for issuing and reviewing the Combined Code on Corporate Governance in the UK. This Code states the requirements of corporate governance best practices. In section A.3, the Code requires the board of directors to be balanced between executive directors and NEDs, especially independent NEDs. It states that *"(The board should include a balance of executive and non-executive directors (and in particular independent non-executive directors) such that no individual or small group of individuals can dominate the board's decision taking)"*. It adds *"(there should be a strong presence on the board of both executive and non-executive directors)"*.

In section A.3.2, the code requires a specific proportion of NEDs' presence: *(at least half the board, excluding the chairman, should comprise non-executive directors determined by the board to be independent)*. This suggests that having NEDs can have a positive impact on corporate performance. However, it is fact that a majority of studies that have investigated the effect of non-executive directors used data from US companies. There are differences also between board construction in the UK and the US. After publication of the Cadbury Report (1992), the percentage of non-executive directors on the boards of UK companies increased from 35.3% in 1988 to 46% in 1996 (Dahya *et al.*, 2002). It is clear that UK boards are dominated by executive directors, whereas in the US executive directors account for 18% of board composition (Xie *et al.*, 2003).

2.4.2.3 Duality

Another important aspect of the corporate governance system is duality, which has the possibility to mitigate or aggravate agency problems. Duality occurs when one individual is appointed as CEO and board chairman, which concentrates too much power in one person. The main responsibility of the board chairman is to manage the board of directors. Traditionally, this includes monitoring managers, reviewing the corporate performance, setting the strategic plans for a firm, scheduling the meetings of the board, and resolving problems in the board or firm (Laing and Weir, 1999). On the other hand, the main responsibility of the CEO is to manage the daily operations of the company and fulfil the decisions of the board of directors.

Duality can be explained in the light of agency theory and stewardship resource dependence. However, combining the role of CEO and the board chairman can positively affect corporate performance for several reasons, according to stewardship theory. First, considering the CEO as an executive director: the CEO seems to be more experienced, knowledgeable and more informed about the future plans and investment opportunities of the firm than a non-executive director who is the board chairman or CEO (Weir *et al.*, 2002). Second, duality enables the CEO to concentrate more on the main objectives of his company (Haniffa and Hudaib, 2006), which may improve corporate performance, because the process of decision-making will be quicker, and the directorship will be clearer (Haniffa and Hudaib, 2006). Third, it has been suggested that combining the role of the CEO and the chairman reduces compensation, which leads to reducing the remuneration of managers in general (Vafeas and Theodorou, 1998). Combining the role also easies the accountability by specifying who is responsible for poor corporate performance and who should be blamed for it (Bozec, 2005).

On the other hand, the literature has suggested that combining the role of the CEO and the chairman has a negative impact on corporate performance (See for example, Lipton and Lorsch, 1992, Jensen, 1993). Jensen (1993) suggests that duality can reduce the ability of board to monitor the CEO and can increase agency costs, since the board is responsible for appointing, assessing and compensating the CEO. As a consequence, from agency theory's

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perspective, having two individuals in the roles of CEO and chairman increases the ability of the board to be more independent and effective in monitoring managers (Lipton and Lorsch, 1992, Haniffa and Cooke, 2002). For instance, having different individuals as the CEO and chairman enables the board to dismiss a CEO who performs poorly (Jensen, 1993, Monks and Minow, 2004). This leads to limiting opportunistic behaviour by managers and discourages them from pursuing their own objectives.

However, the empirical studies that have examined the impact of duality on corporate performance have been inconsistent (See for example, Rechner and Dalton, 1991, Brickley *et al.*, 1997, Weir *et al.*, 2002). Rechner and Dalton (1991) examine the relationship between duality and corporate performance measured by return on equity, return on investment, and profit margin in 141 US companies over the period 1978 to 1983. Their findings document that duality is negatively associated with corporate performance. However, their study focuses only on large US firms, uses only accounting measures to evaluate performance, and does not control specific characteristics of a firm, such as size and industry sector (Donaldson and Davis, 1991). Dahya (1996) investigates the reaction of the stock market to the combining or splitting of the roles of CEO and chairman in 124 UK companies over the period from 1989 to 1992. Their conclusions suggest that the market reacts favourably to the separation of the roles.

Dahya, Garcia and Bommel (2009b) investigate the impact of splitting the roles of CEO and chairman on corporate performance in 1124 UK firms over the period 1986 to 1997. They find that companies separating the combined positions of CEO and chairman did not experience absolute development in corporate performance. Likewise, Vafeas and Theodorou (1998) and Weir and Laing (2000) find that duality does not negatively affect corporate performance. Further, Haniffa and Hudaib (2006) report that companies that have different individuals as CEO and chairman experience better corporate performance than other companies that combine the role. This suggests that splitting the roles is likely to improve the ability of the board of directors to monitor the management. Furthermore, Chahine and Tohmé (2009) examine the association between duality and initial underpricing and initial price offerings in 127 companies in 12 countries across the Middle

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East and North Africa. Their findings show that there is a significant relationship between combining the roles of CEO and chairman and underpricing. This conclusion indicates that the market considers duality to be an undesirable aspect of the corporate governance system.

In contrast, a considerable number of corporate governance studies have found a positive relationship between duality and corporate performance (See for example, Donaldson and Davis, 1991, Boyd, 1995, Kiel and Nicholson, 2003). Donaldson and Davis (1991) examine the relationship between duality and shareholder returns in 321 US listed firms over the period from 1985 to 1987. Their findings show that companies that have combined the roles have higher shareholder return than companies that have separated the roles. This is inconsistent with the findings of Rechner and Dalton (1991), who find a significant relationship between duality and corporate performance; the results of Donaldson and Davis show the same tend even after taking into account specific features of firms such as firm size and industry.

Similarly, Boyd (1995) investigates the impact of duality on corporate performance, measured by returns on investment, in 192 US listed firms in 12 industries, over the period from 1980 to 1984. He finds that companies that combined the role of the CEO and the chairman outperformed companies that separated the roles. This may suggest that combining the leadership of a firm leads to the development of the decision-making process and enables the CEO to focus more on the firm's objectives. Additionally, Kiel and Nicholson (2003) investigate the impact of duality on corporate performance, measured by Tobin's Q, in 348 Australian listed firms in 1996. Their findings report that there is a positive relationship between duality and corporate performance.

However, another stream of empirical studies has indicated that there is no relationship between duality and corporate performance. Using 25 Canadian listed companies over the period of 1976 to 2000, Bozec (2005) finds that there is no relationship between duality and return on sales, assets turnover, and sales efficiency. Likewise, Haniffa and Hudaib (2006) find that duality is statistically insignificantly associated with corporate performance, measured by Tobin's Q, in 347 Malaysian listed companies. This conclusion

is consistent with findings of prior studies that duality has no effect on corporate performance (e.g., Baliga *et al.*, 1996, Brickley *et al.*, 1997, Vafeas and Theodorou, 1998, Laing and Weir, 1999, Weir and Laing, 2000, Rhoades *et al.*, 2001). In the UK, this issue has been investigated by several studies. Dahya, Garcia & Bommel (2009b) find no differences in corporate performance between companies that combined the roles of CEO and chairman, and other companies that separate the roles. Further, Weir, Laing & McKnight (2003) indicate that duality does not have impact on the firms' value.

In its different versions, the combined code on corporate governance has emphasised that duality is an undesirable aspect of corporate governance. In section A.2, it states that *"There should be a clear division of responsibilities at the head of the company between the running of the board and the executive responsibility for the running of the company's business. No one individual should have unfettered powers of decision"*. In subsection A.2.1, the code becomes clearer in requiring the separation of the roles of CEO and chairman; it states *"The roles of chairman and chief executive should not be exercised by the same individual"*. Furthermore, it requires that the chairman should be an independent non-executive director. In subsection A.2.2, it states *"The chairman should on appointment meet the independence criteria"*. However, prior UK empirical evidence has been inconsistent in this regard. For example, Carapeto, Lasfer and Machera (2005) and Dahya, Lonie and Power (1996) report the announcement of the separation of the roles of CEO and chairman is positively related to abnormal returns for large UK firms. By contrast, a number of studies have found no impact of duality on corporate performance (Vafeas and Theodorou, 1998, Weir and Laing, 2000).

2.4.2.4 Size of Board of Directors

One key factor that has an important impact on the board of directors is its size. As a consequence, the literature has attempted to examine theoretically and empirically the impact of board size on corporate performance, and has reported inconsistent conclusions. From agency theory perspective, having a large board of directors is not a desirable aspect of corporate governance, whereas a smaller board of directors seems to be more effective and a motivator of better corporate performance (e.g., Lipton and Lorsch, 1992,

Sonnenfeld, 2002). This because a large board needs more financial resources such as remunerations and bonuses, thus it is costly to have a large board of directors. Further, a large board of directors can easily be dominated by the CEO since coordination is difficult among a large number of directors (Jensen, 1993).

In particular, it has been suggested that the optimal board of directors' size should be not more than nine directors (Lipton and Lorsch, 1992). Lipton and Lorsch (1992) argue that, if the number of directors on the board is more than the a maximum level of ten, then the extra charges of having more directors that are usually linked to slow progress of decision-making are greater than any marginal benefits to be gained from an increased ability of monitoring the managers' actions. In addition, it is likely that having a small board of directors leads to the ability to have productive discussions. This can be because every director has the chance to participate in the discussion and express their view in a meeting (Lipton and Lorsch, 1992). Further, Yawson (2006) argues that *"smaller boards are effective in corporate decision-making and are more likely to sanction personnel layoffs in response to performance declines"*.

On the other hand, it has been suggested that a large board of directors is likely to be related to the development of corporate performance (e.g., John and Senbet, 1998, Yawson, 2006). This is because a large board of directors provides a firm with more skills, expertise, and experience than are found in smaller boards (Haniffa and Hudaib, 2006). Further, a large board of directors facilitates interaction between the firm and its business environment, which leads to a reduction in business risk and costs of sources such as fund and raw materials (Pearce II and Zahra, 1992, Goodstein *et al.*, 1994). In addition, a large board of directors is likely to be associated with more experience and knowledge, which makes the board able to make decisions based on worthy advice (Yawson, 2006). Finally, it has been indicated that there is a positive relationship between a board's size and its ability to monitor managers (John and Senbet, 1998). This is because a large number of directors on the board can provide required experience and skills to monitor managers' actions (Kiel and Nicholson, 2003).

The findings of empirical studies regarding the impact of board size on corporate performance are contradictory. Yermack (1996) is considered among the first initiatives to examine the impact of board size on corporate performance in 452 US industrial firms over the period 1984 to 1991. His results document that there is a negative relationship between board size and corporate performance measured by Tobin's Q. This finding is robust with specific characteristics of a firm such as firm size, growth opportunities, board structure, director ownership and industry sector. In particular, Yermack indicates that corporate performance declines steadily if the board size is between four and ten directors. Beyond this limit, there is no impact between board size and corporate performance.

Generally, the empirical evidence in the US (e.g., Vafeas, 1999b, Vafeas, 1999a, Cheng, 2008, Cheng et al., 2008, Coles et al., 2008) and in other countries (e.g., Eisenberg et al., 1998, Bozec, 2005, Guest, 2009) indicates that, generally, small boards of directors seem to be associated with better corporate performance. This is consistent with the findings of Yermack (1996). However, Yermack (1996) has been criticised for concentrating solely on large industrial companies, and his findings cannot be generalised to small companies, as they are in different sectors and legal environments (Eisenberg et al., 1998). Avoiding the criticism of Yermack, Eisenberg et al., (1998) investigate the impact of board size on corporate performance in 879 small and midsize Finnish companies over the period from 1992 to 1994. They find a negative relationship between board size and return on assets as a measure of companies' profitability, which is consistent with Yermack.

In addition, in a sample of 460 UK listed companies over the period from 1981 to 2002, Dahya et al. (2002) report that performance is associated with CEO turnover and board size. Likewise, Guest (2009) finds a statistical significant negative relationship between board size and corporate performance in 2746 UK quoted firms over the period from 1981 to 2002. Generally, these results suggest that smaller board size is likely to be related to quick decision-making process, effective assessment of managers' performance, and supports the effectiveness of monitoring by the board (e.g., Lipton and Lorsch, 1992, Jensen, 1993). Using Tobin's Q to measure corporate performance in 347 Malaysian quoted companies, Haniffa and Hudaib (2006) find larger board size has a negative impact

on corporate performance. This supports the findings of prior studies that investors consider larger boards cannot effectively monitor managers and are financially costly in terms of compensation and bonuses (e.g., Yermack, 1996, Eisenberg *et al.*, 1998).

In contrast, Adams and Mehran (2008) find board size is statistically significantly and positively related to corporate performance measured by Tobin's Q in 35 US quoted banks over the period from 1959 to 1995. This relationship takes the same trend even after taking into account a possibility of endogeneities between board size and Tobin's Q. Furthermore, this statistically significant and positive relationship between board size and Tobin's Q has been found by Beiner et al. (2006) in Swiss quoted firms, and Henry (2008) in Australian quoted firms. In the UK, Vafeas (1999a) indicates that board size is likely to be related to a high level of board activities in 307 UK firms over the period from 1990 to 1994. Similarly, Haniffa and Hudaib (2006) report a positive relationship between board size and corporate performance measured by return on assets in Malaysian listed firms. This conclusion is in contrast with the negative relationship they find when they measure corporate performance by Tobin's Q.

As has been mentioned before, the findings of Guest (2009) find board size has a strong negative impact on corporate performance measured by Tobin's Q in 2746 UK listed firms over the period from 1981 to 2002. In addition, Conyon and Peck (1998) find a significant negative relationship between board size on one hand, and market to book value and profitability on the other, in 481 UK listed firms for 1992 to 1995. Similarly, Lasfer (2004) reports a significant negative relationship between board size and Tobin's Q.

2.4.2.5 Director Shareholdings

The literature has proposed that director shareholdings is a possible solution that can mitigate agency problems. Director shareholdings can be explained in the light of two conflicting theory: first, interest convergence; and second, entrenchment. Agency theory proposes director shareholdings as a mechanism that reduces the conflict of interest between managers and shareholders (e.g., Jensen and Meckling, 1976, Fama, 1980, Jensen, 1993). This interest convergence model assumes that, as the directors' ownership in the

company increases, their opportunistic behaviour decreases and their interests become closer to the interests of shareholders. In this situation, the directors will endeavour to increase the wealth of shareholders, since any decrease in it will lead to decrease in the directors' wealth as well. Therefore, an increase in share ownership by directors is considered as an additional motivation for them to monitor the management and increase corporate performance.

However, another stream of literature has suggested an alternative explanation of director shareholdings in the light of manager entrenchment (Morck *et al.*, 1988, McConnell and Servaes, 1990, Short and Keasey, 1999). The entrenchment concept assumes that at low level of director shareholdings, the external and internal competitive parties play an important role in aligning the interests of managers with the best interests of shareholders. However, it has been suggested that, at a high level of director shareholdings, directors may use their voting right to defend their interests against shareholders and other stakeholders. In such a situation, directors may be willing not to maximise the wealth of shareholders because they can get bonuses, compensations, salaries and other benefits greater than earnings from their ownership in the company. This leads to directors' entrenchment, where shareholders cannot intervene in directors' decisions or fire them, even if there is seriously poor performance. Therefore, director shareholdings in this case is likely to have a negative impact on corporate performance. In addition, the literature has indicated that, combining the assumptions of interest convergence and entrenchment, leads to rise no relationship between director shareholdings and corporate performance (e.g., Morck *et al.*, 1988, McConnell and Servaes, 1990). Consequently, a low level of director shareholdings is likely to be associated with better corporate performance.

However, the empirical evidence regarding the relationship between director shareholdings and corporate performance is inconsistent. Some studies have reported a negative relationship between both variables; others have found no relationship; and a third group has found no link. Using 371 US firms from Fortune 500 in 1980, Morck et al., (1988) find a significant non-monotonic impact of director shareholdings on corporate performance measured by Tobin's Q. They report Tobin's Q first increases, then decreases, and finally

increases slightly as director shareholdings increases. Specifically, their findings show a statistical significant and positive relationship between director shareholdings and corporate performance between 0% to 5% director shareholdings; then a statistical significant and negative impact between 5% and 25%; and finally a statistical significant and positive impact at 25% or more. This suggests that a low level of director shareholdings mitigates agency problems and increases corporate performance, whereas high level managerial entrenchment has a negative impact on corporate performance.

In the US, McConnell and Servaes (1990) report a significant curvilinear relationship between director shareholdings and Tobin's Q for 1173 US listed firms for 1976, and 1093 US listed firms for 1986. This relationship continues positively until the director shareholdings level reaches between 40% and 50%, and then is negative after that. This evidence has been supported by Hermalin and Weisbach (1991). In the UK, Short and Keasey (1999) investigate the relationship between director shareholdings and Tobin's Q as a proxy of corporate governance in 225 UK listed firms from 1988 to 1992. They find UK management becomes entrenched at a higher level of director shareholdings than does US management. Charlie Weir and Laing (2000) find a significant positive relationship between director shareholdings and return on assets in a sample of 200 UK listed firms for two years, 1992 and 1995. Furthermore, Davies, Hillier, and McColgan (2005) examine the relationship between director shareholdings and firm value, measured by Tobin's Q, in a sample of 802 UK industrial listed firms for 1996 and 1997. Their findings reveal that Tobin's Q increases at director shareholdings level of 7% and then decreases at director ownership level of 26%. In contrast, Owusu-Ansah (1998) report a positive relationship between director shareholdings and mandatory disclosure in 49 Zimbabwean listed firms in 1994.

Another trend in the literature has documented that director shareholdings has no impact on corporate performance. For instance, Demsetz and Lehn (1985a) report no relationship between director shareholdings and accounting profit rates for 511 US quoted firms from 1984 to 1989. This evidence is re-examined by Himmelberg et al. (1999) in a sample of 600 US listed firms from 1984 o 1992. They find that director shareholdings do not affect

corporate performance, measured by Tobin's Q. They use panel data to show that director shareholdings is explained by variables describing the firm's environment such as cash flow, capital, and research and development expenses, amongst others. They also report that director shareholdings is an endogenous variable in corporate performance regressions, indicating concerns about the robustness of previous US empirical studies that consider director shareholdings as an exogenous variable.

The Combined Code does not require directors to have a specific number of shares in their companies in all its different versions. However, it suggests that the remuneration of directors, such as stock options, should be related to corporate performance. Also, it adds that the remuneration scheme should be designed to align the interests of directors with those of shareholders, and a considerable portion of the remuneration should include stock options. These recommendations indicate that the Code assumes director ownership has a positive impact on corporate performance. In section B.1, it states *"Levels of remuneration should be sufficient to attract, retain and motivate directors of the quality required to run the company successfully, but a company should avoid paying more than is necessary for this purpose. A significant proportion of executive directors' remuneration should be structured so as to link rewards to corporate and individual performance"*.

2.4.2.6 Existence of Board Sub-Committees

The literature has suggested that board sub-committees play an important role in improving the effectiveness and efficiently of the board of directors (Jiraporn *et al.*, 2009, Laux and Laux, 2009). There are two types of board sub-committees, those for monitoring, and others for supporting the board of directors (Harrison, 1987). The main task for supporting committees is to give suggestions to the board of directors on important decisions and plans, whereas monitoring committees are responsible for ensuring that management acts in the best interests of shareholders. Agency theory suggests that the main task of monitoring committees is to audit business actions and activities of firms (e.g., Jensen and Meckling, 1976, Fama and Jensen, 1983b). Additionally, monitoring committees are also responsible for ensuring adequate remuneration for directors and managers, and to

nominate experienced and skilful people for managerial positions in companies (e.g., Chhaochharia and Grinstein, 2009, Jiraporn *et al.*, 2009).

Consequently, the establishment of monitoring committees has been adopted widely during the last thirty years (Harrison, 1987). The main committees among monitoring committees are audit committees, nomination committees, and remuneration committees. It is noticeable that the vast majority of corporate governance regulations and codes have recommended the establishment of these committees (Cadbury, 1992, Financial Reporting Council, 1998, United States of America, 2002). However, despite monitoring committees having been widely established, their impact on corporate performance is still seen as a conflicting issue in the literature. In addition, it has been suggested that the establishment of such committees has a positive impact on corporate performance (e.g., Harrison, 1987, Wild, 1994, Sun and Cahan, 2009).

The monitoring committees have unique features, which other operation committees in firms do not have. First of all, the directors on these monitoring committees are generally independent non-executive directors, which give them an advantage as they can the interests of shareholders their first priority (e.g., Klein, 1998, Vafeas, 1999b). Second, members of board sub-committees are usually fewer than members of the board. This enables them to have frequent meetings, fruitful discussions, and a quick and effective decision-making process (Karamanou and Vafeas, 2005, Vafeas, 2005). Third, because monitoring committees are formed to fulfil specific responsibilities, they have to have directors with specific skills, experience and expertise. Consequently, they provide the board of directors with a variety of skilful directors (Harrison, 1987). This also helps the board of directors to concentrate more on strategic objectives and plans. Lastly, the establishment of board sub-committees increases accountability and credibility of financial reporting system by having specialist board sub-committees (Weir *et al.*, 2002).

For example, the audit committee, as one of the board's sub-committees, is required to hold regular meetings with the external auditor to review the financial reporting system and internal auditing system. This leads to a decrease in agency costs and information asymmetry by providing timely information to shareholders and markets (Klein, 1998). In

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addition, the presence of audit committees is likely to be associated with a high quality reporting system (McDaniel *et al.*, 2002, Beasley *et al.*, 2009). Another example is the remuneration committee, which is responsible for determining and reviewing the compensation and bonuses of directors. Its task may reduce agency costs by designing remuneration schemes that link remuneration to corporate performance, in order to motivate directors to act in the best interests of shareholders (Klein, 1998, Weir and Laing, 2000). Further, nomination committees nominate candidates of positions in the board of directors. By appointing independent non-executive directors, nomination committees improve the board of directors' independence and bring skilful and knowledgeable directors to the board (Vafeas and Theodorou, 1998, Vafeas, 1999b).

In contrast, some studies have indicated that board sub-committees may have a negative impact on corporate performance. It has been suggested that establishing board sub-committees is a costly strategy, since the members of these committees need to be compensated and have additional expenses (Vafeas, 1999a). In addition, board sub-committees may practise excessive monitoring to an extent which prevents directors' entrepreneurial initiatives (Goodstein *et al.*, 1994, Vafeas, 1999b, Vafeas, 1999a). Furthermore, the presence of a board of directors and board sub-committees may cause duplication in their duties. This may increase the cost of running these committees and the board. Finally, having specialists in specific areas among the members of board sub-committees and the board of directors could increase the possibility of disagreement among directors.

However, the empirical evidence about the impact of the existence of board sub-committees and corporate performance is still at its beginning (Dalton *et al.*, 1998, Laing and Weir, 1999). A number of studies have suggested the presence of board sub-committees has a positive impact on corporate performance (e.g., Wild, 1994, Chhaochharia and Grinstein, 2009, Sun and Cahan, 2009). Using 260 US listed firms over the period from 1966 to 1980 to find out the market's reaction before and after the formation of an audit committee, Wild (1994) indicates that the market's reaction is significantly greater after the establishment of the committee. This conclusion suggests that

the existence of an audit committee is an effective part of corporate governance and it improves managerial accountability to shareholders. Vafeas (2005) examines the relationship between audit committees and financial reporting quality in 252 US firms between 1994 and 2000. He finds the existence of audit committees has a positive impact on financial reporting quality.

In addition, Karamanou and Vafeas (2005) document that the presence of an audit committee is associated with higher financial disclosure quality in 275 US firms from Fortune 500 between 1995 and 2000. Further, Vafeas (1999b) demonstrates that the presence of nomination committees is positively related to an increase of independent non-executive directors on the board. This suggests that the nomination committees have the ability to enhance the board of directors' quality, which may be associated with the effectiveness of the board in carrying out its responsibilities. Interestingly, Sun and Cahan (2009) and Chhaochharia and Grinstein (2009) document that companies that have compensation committees experience a significant decrease in CEO compensation compared with companies that do not have compensation committees. This conclusion suggests that establishment of remuneration committees is related to high quality of monitoring directors' compensation.

In contrast, other empirical studies have found a negative relationship between the existence of board sub-committees and corporate performance (e.g., Main and Johnston, 1993, Vafeas, 1999a). Main and Johnston (1993) investigate the role of remuneration committees in 220 large British firms for 1989 and 1990. Their findings show that the establishment of remuneration committees seems to be associated with a higher level of pay for top executive directors, which consequently reduces the wealth of shareholders. Likewise, using 606 large US firms in 1994, Vafeas (1999b) examines the relationship between board sub-committees, which are nomination, remuneration and audit committees, and corporate performance. He demonstrates that the formation of board sub-committees has a negative impact on firm value.

A third trend found by the empirical studies suggests that board sub-committees have no impact on corporate performance (e.g., Klein, 1998, Vafeas and Theodorou, 1998, Laing

and Weir, 1999). Klein (1998) examines the relationship between board sub-committees' structure and corporate performance for 485 US firms for 1992 and 486 for 1993. She finds board sub-committees have no statistical significant impact on corporate performance. Additionally, she reports her findings are robust regardless of the structures of committees' membership. Furthermore, in 250 publicly traded firms for 1994 and 1995, Vafeas & Theodorou (1998) find that there is no significant relationship between board structure, including its sub-committees' composition, and firm performance. This conclusion has been supported by Weir and Laing (2000), Weir et al. (2002), Dulewicz and Herbert (2004) and Bozec (2005), who find that the formation of board sub-committees, namely nomination, remuneration and audit committees, has no significant impact on corporate performance.

2.5 Research Questions

Corporate governance mechanisms aim to mitigate the agency problem between managers and shareholders. These mechanisms have mainly focused on the role of the board of directors and its sub-committees (See for example, Cadbury, 1992, Greenbury, 1995, Hampel, 1998, Higgs, 2003). Despite the compliance with the recommendations of the corporate governance is voluntary, UK listed companies are expected to comply with them since the London Stock Exchange requires all listed firms to disclose in their annual reports whether they have complied with the code or justify if they have not done so (Vafeas and Theodorou, 1998, Weir *et al.*, 2002, Financial Reporting Council, 2003, Financial Reporting Council, 2008, Financial Service Authority, 2008).

The examination of the relationship between corporate governance and corporate performance has been the objective of a number of prior empirical studies. However, the findings of these studies are inconsistent. In addition, empirical studies have mainly focused on US listed firms (See for example, Morck *et al.*, 1988, McConnell and Servaes, 1990, Hermalin and Weisbach, 1991, Agrawal and Knoeber, 1996, Beasley, 1996, Bhagat and Black, 1999, DeZoort *et al.*, 2003b). However, the findings of US studies may not generalised to other centuries due to the differences in the regulations, economic environment and governance practices in each country. In addition, accounting regulations,

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financial reporting requirements and institutional differences such as tax system and ownership structure between the UK and the US also highlight the need for more studies in this area (Main and Johnston, 1993, Rosenstein and Wyatt, 1994, Dahya and Travlos, 2000). Consequently, the relationship between corporate governance and corporate performance should be separately examined in each country (Aguilera and Cuervo-Cazurra, 2009, Filatotchev and Boyd, 2009).

Therefore, examining the relationship between corporate governance and corporate performance in different legal systems in different countries could offer insights into the impact of corporate governance. This research mainly aims to explore corporate governance in UK listed firms and it attempts to answer the following questions. Hence, this study investigates the following important research questions using UK listed firms in the FTSE-ALL Share Index for the period of 1999-2009: What is the impact of compliance with the recommendations of the Combined Code on Corporate Governance (2003) on corporate performance? What is the impact of the characteristics of board of directors; namely presence of non-executive directors, duality, board size and the presence of board sub-committees, on corporate performance? The research questions are deconstructed into testable hypotheses as will be explained in chapters four and five.

2.6 Summary

The main focus of this chapter is the theoretical and empirical background of the impact of corporate governance on corporate performance. It attempts to explain the link between corporate governance mechanisms and corporate performance. In this regard, agency theory is considered as the key theoretical background for this study, whereas other supporting theories, namely information asymmetry, stewardship and resource dependence theories are reviewed to offer more understanding of the relationship between agency contractual parties. The review includes the theoretical association of each corporate governance mechanism to the theoretical view in the literature and the empirical impact on corporate performance.

Agency theory suggests that agency problems exist in any contractual relationship between agents and principals. As a consequence of agency problems, agency costs come out when any party of the contractual relationship attempts to violate the contract. Applying the principal of agency theory to modern corporations with a separation between ownership and leadership, the main issue in modern corporations is how to ensure directors act in the best interests of shareholders and work to increase firm value. This can be done by establishing an appropriate control system, which is called corporate governance.

In addition, according to information asymmetry, in order to minimise the moral hazards conflict, directors need to show their intentions to shareholders and markets by adopting certain corporate governance aspects. Furthermore, resource dependence theory assumes that having proper corporate governance mechanisms such as a board of directors and its board sub-committees not only ensures that directors will act in the best interests of shareholders, but also ensures the efficient use of resources to fulfil the firm's objectives. On the other hand, stewardship theory considers a different angle of management by arguing that the directors are trustworthy and consequently they should be authorised to direct a company without being excessively monitored.

The second main objective of this chapter is to review the empirical studies that have investigated the impact of corporate governance on corporate performance. The prior studies have mainly examined the relationship between corporate governance and corporate performance using either an index approach or examining each individual corporate governance mechanism. This study focuses on examining the impact of the level of compliance on corporate performance using a governance index. It also examines the relationship between characteristics of the board of directors and corporate performance. Although the findings of studies that have used governance indices are conflicting, they seem more comprehensive in terms of covering the requirements of corporate governance. Furthermore, the literature of governance index modelling focuses mainly on US firms; whilst the evidence in other countries is limited due to lack of required data. Additionally, since the sample of this study covers quite a long period of time, so this study may help to show the impact of these reports on corporate governance system in the UK.

The next chapter will discuss the research methodology and data. In particular, it will explain data collection; the research methodology, including dependent, independent and control variables; and the regression models that will be used to analyse the data.

Chapter 3

Research Methodology and Data

Introduction

This chapter contains a discussion about the research methodology and the data collection of this study. The main aims of the chapter are as follows: first, it attempts to provide a comprehensive explanation of the data collection and research methodology of this study. The most important point in academic research is to be accurate, and this can be done if the study shows a clear procedure of how the investigation is conducted (Hussey and Hussey, 1997). The second aim of this chapter is to provide a clear explanation of the main reason behind selecting the specific data and methodology design at every step of this research. The third objective is to present a definition for each variable examined and justification for selecting a specific variable to be included. Finally, this chapter will discuss the empirical methods that will be used in the empirical chapters to find out the relationship between corporate governance and corporate performance.

This chapter is organised as follows: section 3.1 discusses the procedure of data collection and the criteria which have been used to include or exclude a firm from the sample. Section 3.2 presents definitions of the variables. This includes definitions of measuring corporate performance, corporate governance variables, and control variables. Section 3.3 discusses the structure of the corporate governance index of this study; while section 3.4 presents descriptive statistics of dependent, independent and control variables. Section 3.5 discusses the panel data analysis and empirical design of the regression models. Finally, section 3.6 summarises the main points discussed in this chapter.

3.1 Quantitative and Qualitative Methodologies

This study follows quantitative approach to examine the relationship between corporate governance and corporate performance. It focuses on secondary date collected from well-known databases. However, the use of secondary date can be among the limitations of this

study and future research should consider examining the relationship between corporate governance and corporate performance by using qualitative research method.

In contrast, Ghauri *et al.* (1995) believe that qualitative approach is accepted for inductive, exploratory research and if the researcher is interested in investigating in depth insight a phenomenon. Qualitative approach is also useful as it can lead the researchers to build and explain hypothesis. This study does not consider the qualitative approach for several reasons. First, investigating the relationship between corporate governance and corporate performance needs several years to be clearly seen. Second, the required data for this study are available in secondary sources such as databases and firms' annual reports. Third, the vast majority of corporate governance studies have mainly employed secondary data, so the use of secondary data facilitates the comparison between the findings of this study and previous studies. Finally, the use of qualitative approach would be very costly if it was used.

3.2 Data

This study uses data that covers corporate governance and financial characteristics of a sample of UK listed firms in the FTSE All-Share Index over the period 1999 to 2009. The sample includes any company that has been part of the FTSE All-Share Index during that period. Both listed and de-listed companies have been included in the sample of UK firms listed on the London Stock Exchange (LSE), from the beginning of 1999. Initially, the sample was of 1513 companies, for any relevant year for which a firm has the required data. Firms were dropped from the sample when any of the independent variables required for the analysis were missing. Since the data was collected from different sources, the sample includes any firm that has available data in the *BoardEx Database* and *Datastream Database*. This selection process reduced the sample to 648 companies.

Also, 199 firms from the financial industry, which accounts for about 31% of the entire population, were excluded from the sample for the following reasons. First, financial firms are heavily regulated, which may differently affect their corporate governance systems and corporate performance compared with other sectors (Yermack, 1996, Weir *et al.*, 2002.

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Cheng, 2008). For example, Section 448 in Chapter ten of Company Act 2006 states that *"the provisions of the act are not applicable to banks and insurance companies, which are regulated by special rules"*. Banks, for example, were specially ruled by the Banking Act 1979, and now by the Banking Act 2009[1]. Therefore, the final sample is of 435 firms and 3875 firm-year observations over the eleven-year period. However, it is worth mentioning that since the sample includes listed and de-listed firms, some companies have no data for the whole period. For example, in 2009 there are 407 firms, but final sample is 435 firms, this is because some of these firms have been included in FTSE-All Index at some point during period but not from the beginning of 1999.

The data is obtained from different sources of data; data on corporate governance characteristics are collected from the *BoardEx database*. This database provides in-depth profiles of directors in private and quoted firms in Europe, North America and Asia. Specifically, this database is used to collected data on the number of executive and independent non-executive directors on the board and board sub-committees, and director ownership. Further, financial data are collected from the *Datastream Database*. Finally, data regarding the number of meetings held by audit committees and whether or not they have at least one financial expert among their members are hand-collected from annual reports. Annual reports for UK listed companies are obtained in electronic format from the *Northcote Website*[2].

Table 4.1 shows the number of companies in the FTSE-All Index for every year from 1999 to 2009, and the number of firms in the sample for each year. It is clear that the sample is a good representation of the population of UK firms in each given year. For instance, in 1999, the sample represents 36% of the population, which is the lowest percentage; and 70% in 2008, which is the highest. Table 4.2 displays the sectors of UK firms according to one-digit FTSE Industry Classification Benchmark (2008) over an eleven-year period. There is a slight change of sample size in every sector, but this change is considerable in sectors such as the Basic Materials Sector, which includes chemicals, forestry and paper,

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[1] For more information visit http://www.legislation.gov.uk

[2] http://www.northcote.co.uk offers electronic copies of UK companies' annual reports.

industrial metals, and mining: the sample size is 10 companies in 1999 and 25 in 2009. Another noticeable change is in the Utilities And Technology Sectors, where the samples have shown a considerable increase. In the Utilities Sector, which includes electricity, gas, water and multi-utilities, the sample size was 6 companies in 1999 and 15 in 2009; and the Technology Sector increased from just 17 companies in 1999 to 42 companies in 2009. In addition, the sample size is quite small in the Oil and Gas sector and the Telecommunications sector.

Table 3. 1 Year-by-year analysis of sample firms

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
Firms in FTSE-All	811	790	754	715	689	695	688	681	673	618	622	7736
Number of Sample Firms	234	282	302	324	343	363	385	403	420	412	407	3875
Percentage of the sample	30.0%	40.0%	40.0%	50.0%	50.0%	50.0%	60.0%	60.0%	60.0%	70.0%	70.0%	

Table 3. 2 Sectoral Breakdown of Sample Set

Industry	Code*	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
Oil & Gas	IN1	7	7	7	7	7	7	7	8	8	8	8	81
Basic Materials	IN2	10	15	16	17	18	19	21	22	25	24	25	212
Industrials	IN3	90	106	114	121	125	133	138	142	145	143	137	1394
Consumer Goods	IN4	23	27	27	30	30	32	32	33	34	32	33	333
Health Care	IN5	13	17	17	20	22	22	24	28	28	28	27	246
Consumer Services	IN6	64	73	80	87	93	100	106	112	117	116	115	1063
Telecommunications	IN7	4	4	4	4	4	4	5	5	5	5	5	49
Utilities	IN8	6	8	9	9	10	10	14	15	15	15	15	126
Technology	IN9	17	25	28	29	34	36	38	38	43	41	42	371
Total		234	282	302	324	343	363	385	403	420	412	407	3875

*This code will be used later in regression equations

Outliers were controlled to deal with their influence on the analysis. There are some extreme values in the dependent variables that measure corporate performance, specifically Tobin's Q (*TQ)* and return on assets (*ROA)*. These extreme values also exist in control variables. For example, the maximum and minimum values of Tobin's Q are -0.46 and 6.76 respectively; whilst for leverage the values are 0% and 190%. Some of the extreme values do not make sense from an economic point of view, and their presence could be as a consequence of entry errors in the databases from where the data was collected. For instance, theoretically a value of leverage that is more than 100% is not possible since a

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company can only fund its operations by debt and equity together or by 100% of both sources. Therefore, in order to ensure the results of this study are not affected by outliers, I follow Shumway (2001) by setting all the observations higher than 99% of each variable to that value; and all values lower than 1% of each variable are set in the same way.

Winsorisation for dependent and control variables improves the statistical results for several reasons. First, the presence of outliers could have a serious impact on regression models, which this study examines. Second, prior corporate governance studies have excluded outliers (See for example, Durnev and Kim, 2005, Beiner et al., 2006, Black et al., 2006b, Chhaochharia and Grinstein, 2007). Last, as will be discussed more below, in general, corporate governance variables have less outliers than dependent and control variables; therefore, following the literature, winsorisation has not been used with them (See for example, Klapper and Love, 2004, Durnev and Kim, 2005).

3.3 Variables' Definitions

This section presents the definitions of dependent and independent variables used in this research. The discussion will focus on the corporate performance variables, which are the dependent variables, namely return on assets and Tobin's Q. In addition, it will define the corporate governance variables as well as control variables. Table 3.3 displays a summary of the variables and their definition, as well as how each variable was measured.

3.3.1 Measuring Corporate Performance

This study attempts to examine the relationship between corporate governance mechanisms and corporate performance in the UK. Thus the main task of dependent variables is to measure the corporate performance. Unlike prior corporate governance studies (e.g., Agrawal and Knoeber, 1996, Yermack, 1996, Beiner et al., 2006, Black et al., 2006a, Henry, 2008), but following some other studies, namely Gompers et al., (2003), Klapper and Love (2004), Haniffa and Hudaib (2006), Weir et al., (2002), and Guest (2008), this study uses Tobin's Q *(TQ)* as a market measure, and return on assets (*ROA*) as an accounting measure of corporate performance. *ROA* is obtained directly from the

Datastream Database, whereas Tobin's Q *(TQ)* is defined as market capitalisation plus total debt divided by total assets.

Using *ROA* and Tobin's Q *(TQ)* to measure corporate performance is motivated by two reasons. First, prior empirical evidence indicates that corporate performance is valued differently by directors and investors (Black *et al.*, 2006a, Dahya and McConnell, 2007). Thus, the *ROA* aims to find out the wealth impacts of corporate governance from the viewpoint of directors, whereas Tobin's Q *(TQ)* attempts to evaluate the corporate governance from the viewpoint of investors. Second, both measures have their own weaknesses and strengths, and prior corporate governance studies have not agreed on a specific measure to be the perfect proxy for corporate performance (Haniffa and Hudaib, 2006). Therefore, the use of *ROA* and Tobin's Q (TQ) attempts to investigate the robustness of the findings of one measure against those of the other.

i) Return on Assets (ROA)

This has been defined as the book value of operating profit divided by the book value of total assets at the end of a financial year (Yermack, 1996, Beiner *et al.*, 2006, Fich and Shivdasani, 2006). Return on assets (*ROA*) is an indicator of the efficiency and effectiveness of companies' directors in managing operations and using their companies' assets to create profits (Ross *et al.*, 2003). Generally, a high value of *ROA* indicates that the managers direct the firm effectively and efficiently and this leads to maximisation of the firm's value and the wealth of its shareholders. In addition, *ROA* is a good tool to measure corporate performance since it eradicates the differences in firm size, which eases the comparisons between companies (Lev and Sunder, 1979). Further, it has been suggested that *ROA* may demonstrate year-to-year fluctuations in fundamental business conditions better than other rates of stock market return (Demsetz and Lehn, 1985a). This can be explained as ratios of stock market return demonstrate future developments which may not reflect the current fluctuations in business conditions. Also, *ROA* has been widely used by previous studies that have investigated the relationship between corporate governance and corporate performance (e.g., Shrader and Blackburn, 1997, Gompers *et al.*, 2003, Klapper and Love, 2004, Core *et al.*, 2006, Haniffa and Hudaib, 2006, Cui *et al.*, 2008).

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However, the use of *ROA* has its limitations, which have to be mentioned in this regard. First, the main focus of *ROA* is on historical data, so it does not give any indicators about the future expected profits (Ross *et al.*, 2003). Second, it has been suggested that *ROA* is vulnerable to any type of manipulation by management, since it is sensitive to changes in policies and methods of accounting (Alexander *et al.*, 2007, Mangena and Tauringana, 2008). Third, because *ROA* is an accounting ratio to measure profitability, it does not take into account the level of risk for different companies (Ross *et al.*, 2003). The final criticism is that *ROA* does not identify the differences in industry sector and non-financial performance, such as clients' and workers' satisfaction, and changes in inflation rate (Alexander *et al.*, 2007). However, the effect of these limitations is reduced by adding control variables that consider the impact of industry sector, firm size, and years dummy on corporate performance.

ii) Tobin's Q

Tobin's Q (*TQ*) has been defined as the ratio of the market value of equity plus the book value of debt to the book value of total assets (Chung and Pruitt, 1994, Beiner *et al.*, 2006). *TQ* has been used as a measure of financial performance and firm value from the investors' perspective, and markets' valuation of a company and its corporate governance mechanisms. This study adopts the definition of Chung and Pruitt (1994) approximation of *TQ* as it demonstrates 96.6% of the original *TQ*, and the original equation of Tobin (1969) has some difficulties in calculation such as costly effort and information requirements. Lewellen and Badrinath (1997) describe the role of *TQ* as it *"measures the replacement cost of a firm's assets"*. However, this study uses book value of assets as a proxy for the replacement cost of a firm's assets; this is because of data limitations. In general, *TQ* assesses to what extent a company's management is successful in using its assets to maximise the wealth of shareholders. Similar to *ROA*, a high value of *TQ* indicates that managers work effectively and provides a better indicator for the market about the firm's performance and value.

In the literature, *TQ* has been widely used as a proxy for firm value and corporate performance, not only in the terms of corporate governance (See for example, Morck *et al.*,

1988, Agrawal and Knoeber, 1996, Yermack, 1996, Gompers *et al.*, 2003, Henry, 2008), but also in corporate finance studies (See for example, Chung and Pruitt, 1994, Perfect and Wiles, 1994, Lewellen, 2004). This wide use in corporate performance empowers the validity of *TQ* and establishes an empirical justification for using it in any other study. However, like any performance measure, *TQ* has its own disadvantages and limitations as a proxy of firm value. The criticisms of it concern its construction and possible errors (See for example, Klock *et al.*, 1991, Chung and Pruitt, 1994).

TQ has been criticised for requiring too much data and calculating efforts, so it is considered a costly measure (Chung and Pruitt, 1994). Consequently, different approximations of *TQ* have been consistently developed to use the book values of assets, debt and equity (See for example, Chung and Pruitt, 1994, Perfect and Wiles, 1994, Lewellen and Badrinath, 1997). Therefore, it can be argued that *TQ* is a historical measure because it depends on historical accounting data which is prepared according to historical cost accounting (Padgett and Shabbir, 2005). Hence, *TQ* seems to have the same limitations as accounting-based measures of corporate performance, such as creative accounting and manipulation by managers. However, this criticism can be considered unimportant in the light of the movement towards fair value accounting (Alexander *et al.*, 2007), or the use of a mixed approach of historical cost accounting and mark-to-market accounting (Danbolt and Rees, 2008).

Another criticism of *TQ* is that its associations with corporate governance may generate counterfeit findings, which means that a high value of *TQ* may not actually indicate a good use of a company's assets by its managers. This can be explained due to different values of some items of the balance sheet. In other words, different book and market values of some assets in the balance sheet, such as tangible assets, can be undervalued or overvalued (Beattie and Thomson, 2007). Another reason can be that some intangible assets cannot be measured accurately and shown in the balance sheet, such as human resources; also, the market value may not be able to evaluate the real value of assets (Beattie and Thomson, 2007). Similar to *ROA*, *TQ* may not be able to capture other aspects of corporate governance mechanisms, such as the relationship between executive and non-executive

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directors on the board or its sub-committees. Like market based performance measures, different values of TQ may not display an accurate value of the unobserved economic situation of a company, but may be affected by the feelings of investors, and speculation (Henwood, 1998). A clear anecdotal instance of this case is the current financial crisis, which is sometimes called the 'credit crunch', whereby share prices for some financial companies decreased as a result of investor speculations (Daglish, 2009, Gorton, 2009, Turner Review, 2009, Walker Review, 2009).

3.3.2 Control Variables

In investigating the relationship between corporate governance and corporate performance, the economic variables that estimate corporate performance should not be omitted, because to do so could cause erroneous findings (Black *et al.*, 2006a, Chenhall and Moers, 2007b). Furthermore, theoretically, the use of control variables has the possibility of forbidding companies to reach 'optimal differences', that is, a position where different companies apply different corporate governance practices (Black *et al.*, 2006a); endogeneity; or omitted variable bias (Larcker and Rusticus, 2007). In order to minimise possible omitted variable bias and endogeneity, a number of control variables are included in the regression model, in addition to the governance index, which is the main focus in this model. The next section describes reasons for selecting control variables and how to calculate each of them. Furthermore, it is worth mentioning that the control variables have been selected according to theory and the empirical evidence of prior studies; similar to prior positive accounting research, these control variables may not be comprehensive (See for example, Chenhall and Moers, 2007b, Chenhall and Moers, 2007a, Larcker and Rusticus, 2007). It may be that there are other control variables that affect corporate governance and corporate performance, but they have been excluded from the model due to unavailability of data or lack of theoretical support (Chenhall and Moers, 2007b).

i) Sales Growth

Durnev and Kim (2005) document that companies that have higher opportunities are more likely to grow faster than other companies. Theoretically, growth opportunities can be

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reflected in the market valuation of companies (Klapper and Love, 2004). Additionally, growing firms with a large need for external financing have the motivation to adopt better governance practice so that they can attract investors and reduce capital cost (Beiner *et al.*, 2006). Previous studies have found a positive relationship between corporate performance and growth opportunities measured by year on year sales growth *(SALESG)*, as this study adopted (See for example, Gompers *et al.*, 2003, Drobetz *et al.*, 2004, Cui *et al.*, 2008, Henry, 2008).

ii) Capital Expenditure

Theoretically, companies that work in technology invest in innovative initiatives so that they can gain competitive advantage by producing new products or services (Jermias, 2007, Brown *et al.*, 2009). These new products enable the companies to gain quasi-monopoly and as a result gain premium prices and profit for long-term performance (Jermias, 2007). In contrast, innovation requires intensive investment, with the expectation of high future revenue, and this may have a negative impact on the performance for the current period (Weir *et al.*, 2002). Therefore, companies in the technology sector have to adopt strict corporate governance to protect their intangible assets, since this type of asset can be stolen more easily than fixed assets (Durnev and Kim, 2005). Consistent with prior studies, investment opportunities and the innovative potential of companies, measured by the ration of capital expenditure to total assets *(CAPITE)*, are expected to have a negative impact on corporate performance (Durnev and Kim, 2005, Black *et al.*, 2006c, Brown *et al.*, 2009).

iii) Firm Size

It has been suggested that firm size is likely to be have a positive impact on corporate governance mechanisms, due to the differences in costs of compliance, differences in operations, market regulations, and agency problems (e.g., Jensen, 1986, Himmelberg *et al.*, 1999, Beiner *et al.*, 2006). Botosan (1997) suggests that large companies may get external fund at lower cost or gain higher firm value, due to their size. On the other hand, smaller firms seem to be better than large firm in terms of growth opportunities, and as a

result they will need external funding to finance these opportunities (Klapper and Love, 2004). Therefore, in order for smaller companies to attract investors, they have to adopt a strict corporate governance system, so that they can gain external funding at lower cost and increase profitability. Additionally, faster growth is likely to have a positive impact on financial performance, measured by TQ (Black *et al.*, 2006a); this is due to the fact that growth opportunities can be reflected in TQ (Young *et al.*, 2008).

Empirical corporate governance studies have been inconclusive on the effect of firm size on corporate performance (Himmelberg *et al.*, 1999). For instance, Agrawal and Knoeber (1996) and Durnev & Kim (2005) document that firm size is negatively associated to corporate performance measured by TQ; whereas Haniffa and Hudaib (2006) report a positive relationship between corporate performance, measured by return on assets, and TQ. This study uses firm size *(FSIZE)* as a control variable, and it is calculated as the natural logarithm of total assets.

iv) Leverage

Jensen (1986) suggested that debt can be considered as a corporate governance mechanism, since it plays a role in reducing the agency costs of free cash flows by preventing investments in non-positive net present value (NPV) projects. Therefore, using debt improves the control system and motivates the management to improve their companies in a satisfactory manner (Jensen, 1986). In addition, debt is deemed a tool to increase firm value by giving the management an opportunity to signal its desire to increase the firm's business and to be monitored lenders (Beiner *et al.*, 2006). Financially, interest payments are tax deductible (Modigliani and Merton, 1963), and as such, assuming everything else is equal, high leverage should be a reason to enhance corporate performance. Therefore, leverage is included as a control variable, which is calculated as ratio of total debt to total assets (Weir *et al.*, 2002).

Jensen (1986) indicates that the use of debt will be higher in larger companies rather than smaller companies. This has been supported by Bevan and Danbolt (2002). Rajan and Zingales (1995) document that there is a positive relationship between debt and firm size,

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and a negative relationship with profitability in a sample of UK listed companies. Thus. it is expected that there will be a positive relationship between leverage and firm size, but a negative one between leverage and corporate performance. On the other hand, using debt enhances the chance of bankruptcy and credit risks (Jensen, 1986), which may deprive a firm from investing in profitable opportunities and growing (Myers, 1977). Therefore, the growth potential, which is measured by sales growth, innovative potential which is measured by capital expenditure, will be negatively associated with leverage. Furthermore, leverage is expected to vary among different industries and over a period of time.

v) Research and Development Expenditure

A firm invests in new products to get a competitive advantage in the market by creating a new product or introducing a new service. Once these new products or services become available, companies can demand higher prices and generate profitability in the long term (Barney, 1991, Calantone *et al.*, 2002). Additionally, a new invention can also be considered as a barrier for rivals, preventing them from entering the market and attracting new clients (Golder and Tellis, 1993). However, despite the important role of research and development expenditure (R&D) in achieving success in the market, empirical studies have been inconclusive about the impact of R&D on corporate performance. For example, Lev and Sougiannis (1996) find that every increase in R&D by one dollar, generates between 1.70 to 2.60 dollars in future earnings. Likewise, Bublitz and Ettredge (1989) report that R&D expenditures have a positive impact on future cash flows. Similarly, Chan *et al.* (1990) find that share prices respond positively and significantly to announcements of an increase in R&D. However, other empirical studies have not found a significant relationship between R&D expenditure and corporate performance (Johnson, 1967, Hall and Bagchi-Sen, 2002).

Following prior corporate governance studies (See for example, Vafeas and Theodorou, 1998, Dahya and McConnell, 2007), this study uses R&D as a control variable, measured by the ratio of total research and development expenditure to the book value of total assets.

vi) Industry Sector

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The impact of corporate governance practices on corporate performance may differ from one company to another according to the industry sector, complex operations, concentration ownership and type of business (Haniffa and Cooke, 2002, Lim *et al.*, 2007). Additionally, some industries may be more affected by economic and global financial environment than others. For instance, the increase in oil price may increase the performance of companies in the Oil and Gas sector, but this increase has a negative impact on the Industrial Goods and Services sector. Following prior corporate governance studies (See for instance, Klapper and Love, 2004, Beiner *et al.*, 2006, Black *et al.*, 2006a, Henry, 2008), this study uses the first digit of the *Industry Classification Benchmark (FTSE, 2008)* to classify UK listed firms in sectors. This classification includes nine industries, as shown in Table 3.2; this research uses industry dummies, which are *IN0* for *Oil & Gas Industry*, *IN1* for *Basic Materials Industry*, etc, up to *IN9* for *Technology Industry*.

vii) Year

The literature has suggested that corporate governance practices and practices change over a period of time across companies (Padgett and Shabbir, 2005, Henry, 2008). For instance, Padgett and Shabbir (2005) examine the relationship between compliance with the corporate governance requirements and corporate performance for FTSE 350 UK listed firms over the period 2000 – 2003. They report that compliance with corporate governance recommendations is positively related to time. This conclusion has been supported by Henry (2008), who investigates the relationship between compliance with corporate governance requirements in 116 Australia listed companies and firm value during the period 1992 – 2002. He documents a positive relationship between time and compliance with corporate governance requirements. However, there is another important factor affecting corporate performance, which is economic change. Generally, corporate performance seems to be higher in times of economic boom than it is in periods of financial crisis. The current state of global economies shows anecdotal evidence about the impact of economic changes on corporate performance (Turner Review, 2009, Walker Review, 2009).

Likewise, corporate governance mechanisms and corporate performance can be affected by changes in tax regulations, technology development, and changes in listing rules over a period of time. This can be interpreted as there is a likelihood that corporate performance, measured by *TQ* and *ROA*, will be different among firms over time. Additionally, prior studies have used a year dummy as a control variable among their variables (e.g., Padgett and Shabbir, 2005, Guest, 2008, Henry, 2008), which can make the comparison between them more easer. Hence, this study uses dummy variable equal to one for every for eleven years *(Y1, Y2 ... Y11)* from 1999 to 2009 to control any possibility of unobserved heterogeneity.

Table 3. 3 Variables definitions and explanation for the equilibrium model

Variable	Acronym	Explanation *(Datastream Code)*
1. Corporate Performance	*CP*	
Return on Assets (ROA)	*ROA*	Collected directly from Datastream Database *(WC08326)*.
Tobin's Q	*TQ*	It is the total assets *(WC02999)* minus book value of equity *(WC03501+ WC03451)* plus market value of equity *(MV)*, all divided by total assets *(WC02999)*.
2. Corporate Governance		
Percentage of independent non-executive directors	*NED*	The ratio of total independent non-executive directors to total number of directors on the board
Board Size	*BSIZE*	The total number of directors on the board at the end of financial year
Duality	*DUAL*	A dummy variable is equal to (1) if the position of CEO and chairman are played by the same director, (0) otherwise.
Managerial shareholdings	*MOWNER*	The ratio of total number of ordinary shares owned by directors of the board to total number of outstanding ordinary shares.
External shareholdings	*EOWNER*	The ratio of total number of ordinary shares held by institutions or block shareholders with at least 3%, to total number of ordinary shares.
Presence of Audit Committee	*AC*	A dummy variable is equal to (1) if a firm has an audit committee and 0 otherwise.
Presence of Nomination Committee	*NC*	A dummy variable is equal to (1) if a firm has a nomination committee and 0 otherwise.
Presence of Remuneration Committee	*RC*	A dummy variable is equal to (1) if a firm has an audit committee and 0 otherwise.
4. Control Variables		
Sales Growth	*SALESG*	The ratio of current year's sales *(WC01001)* minus previous year's sales *(WC01001)*, all divided by previous year's sales *(WC01001)*.
Capital Expenditure	*CAPITE*	The ratio of total capital expenditure *(WC04601)* to total assets *(WC02999)*.
Capital Structure	*CAPITS*	The ratio of total debt *(WC03255)* to total ordinary equity *(WC03501+ WC03451)*.
Firm Size	*FSIZE*	Natural logarithm of the book value of total assets *(WC01001)*.
Leverage	*LEV*	The ratio of total debt *(WC03255)* to total assets *(WC02999)*.
R&D Expenditure	*R&D*	The ratio of R&D expenditure *(WC01201)* to total assets *(WC02999)*.
Industry Sector	*IN*	A dummy variable for each ten industry sectors: oil & gas (IN0). basic materials (IN1), ... Technology (IN9)
Year	*Y*	A dummy variable for each year of the eleven years from 1999 – 2009. 1999 (Y1), 2000 (Y2) ... 2009 (Y11)

3.3.3 Characteristics of Board of Directors

As has been discussed in the literature review chapter, this study aims to examine the relationship between corporate governance mechanisms and corporate performance. The main focus is on the characteristics of the board of directors, namely the percentage of non-executive directors on the board, CEO-Chairman duality, board size, director ownership, and presence of board sub-committees. In addition, this study develops a governance index to measure to what extent UK listed firms have complied with corporate governance recommendations, and also looks at the impact of this index on corporate performance. Specifically, the characteristics of board are defined as follows:

i) Non-Executive Directors

This variable is defined as the ratio of non-executive directors on the board to the total number of directors on the board.

ii) Duality

Duality occurs when the positions of chairman and CEO are held by the same director. In this study, duality is measured as a dummy variable that is equal to one if one director is appointed as a chairman and CEO, and zero otherwise.

iii) Size of Board of Directors

This variable is defined as the total number of director on the board. This includes the number of non-executive directors plus the number of executive directors.

iv) Director Shareholdings

Director ownership is the number of common stocks held by directors on the board to the total number of outstanding common shares.

v) Establishment of Board Sub-Committees

The recommendations of corporate governance suggest that UK listed firms should establish an audit committee, a remuneration committee, and a nomination committee. This variable is measured by using three dummy variables: AC for audit committees, RC for remuneration committee, and NC for nomination committees. Each dummy variable is equal to one if the committee is established, and zero otherwise. More explanation about the characteristics of the board of directors will be presented in Chapter Five.

3.3.4 Corporate Governance Index

In investigating the relationship between corporate governance and corporate performance, the governance index *(GI)* is used as an independent variable. The index aggregates the provisions of the Combined Code on Corporate Governance in 2003. The Combined Code is composed of two sections, addressing the board of directors and its subcommittees, and institutional shareholders. This Code had been adopted by the London Stock Exchange as requirements for UK listed firms to comply with the Code, or to provide justification in the case of non-compliance. Following prior studies that have followed their national or international codes of corporate governance (e.g., Beiner *et al.*, 2006, Cheung *et al.*, 2007, Shabbir, 2008), this study uses the provisions of the Combined Code to build the governance index.

This study defines the compliance with corporate governance recommendations, which the index of this study attempts to measure, as compliance with the Combined Code on Corporate Governance (the Code) (2003) for two key reasons. First, the Code has adopted the recommendations of Higgs Review (2003) regarding the role of independent non-executive directors, and the Smith Review (2003) regarding the impact of audit committees in UK firms. Therefore, it is more comprehensive than the previous versions. Second, the other versions that followed the Code of 2003 do not make a fundamental change that could affects the corporate governance variables which this study examine.

The governance index investigates the aspects of corporate governance as a whole and their impact on corporate performance. Prior studies that employ the governance index have focused on only one aspect. For example level of shareholder rights (Gompers *et al.*, 2003, Cremers and Nair, 2005); board of directors' size (Yermack, 1996); independence of board of directors (Dahya *et al.*, 2009a); corporate ownership (Demsetz and Lehn, 1985a); role of board chairman and CEO (Baliga *et al.*, 1996, Dahya *et al.*, 2009b); management ownership (Morck *et al.*, 1988); board meeting frequency (Vafeas, 1999a); and other studies. The governance index allows this study to find out the possible interactions between different corporate governance mechanisms as a set and corporate performance.

The literature has suggested two methods to measure the quality of the disclosures of corporate governance mechanisms (See for example, Botosan, 1997, Lang and Lundholm, 2000, Beattie *et al.*, 2004). The first approach has used subjective analyst disclosure quality rankings, which depends on surveys of corporate governance disclosure. This approach is usually used by professional corporate governance rankings institutions such as Standard & Poor's (S&P). The second approach, which is more common, has used researcher-constructed disclosure indices, which are based on calculation of the disclosure of governance aspects, and find out the quality of the disclosure by using a proxy for it; this type of disclosure can be found in annual reports (Beattie *et al.*, 2004). Both approaches have their advantages and disadvantages.

The subjective analyst disclosure quality rankings has been criticised for not considering the disclosure in other sources of information such as media and interim reports, whereas researcher-constructed disclosure indices do consider these types of disclosures (Lang and Lundholm, 1993). However, Hassan and Marston (2010b) indicate that the subjective analyst disclosure quality rankings could be more convincing than researcher-constructed disclosure indices because the latter depend on the knowledge and skills of a professional researcher. Moreover, the researcher-constructed disclosure indices' approach is subject to errors and bias of personal choices by researchers (Core, 2001). It is also more labour intensive and so it is more suitable for research using a small sample size of companies that have less observations than firms in researcher-constructed disclosure indices (Hassan and

Marston, 2010b). Finally, Marston and Shrives (1991) recommend using a current index, which has an important advantage, which is that it can be compared with previous studies that have employed this approach.

In spite of these criticisms, this study follows the researcher-constructed disclosure indices' approach, for several reasons. First, the subjective analyst of disclosure quality rankings have been used to rate corporate governance in a specific country, and the majority of them rate US companies. Therefore, the standards of rating companies may not be appropriate to other countries due to different regulations and approaches of corporate governance. Second, the subjective analyst disclosure of quality rankings may be out of date or suspended (Hassan and Marston, 2010b). In these circumstances, there is no corporate governance ranking for UK listed companies. Third, analysts' ratings usually focus on the largest companies that are influential in their industry, and they are unlikely to produce adequate variation in terms of corporate governance disclosure (Botosan, 1997). Fourth, researcher-constructed disclosure indices are a straightforward measure of corporate governance disclosures, and more accurate and reliable (Lang and Lundholm, 1993). Fifth, the subjective analyst disclosure quality rankings has been described as opinion-based research, which depends on subjective data such as S&P ranking; so any conclusions based on this approach can be considered to be questionable (Beattie *et al.*, 2004, Chen *et al.*, 2009). Finally, so far there is no published UK study that examines the relationship between a corporate governance index and corporate performance by using panel dataset with generalised method of moments regression models.

Following prior studies (For example, Gompers *et al.*, 2003, Black *et al.*, 2006a, Arcot and Bruno, 2007, Henry, 2008, Shabbir, 2008, Morey *et al.*, 2009), this study uses a dummy coding scheme to evaluate the compliance of UK listed firms with the Code. This method of rating includes giving a value of 1 if a company complies with a particular provision of the Combined Code and 0 otherwise. This study selects the Combined Code of 2003 because it includes the recommendations of the Higgs Review (2003) and the Smith Review (2003). It also requires that non-executive directors should form half of the board of directors instead of third of it, which was required by the Code of 1998. The total score

of the Governance Index is 15 points, so a firm's total score ranges between zero (0%), indicating complete non-compliance, and 15 points (100%), indicating complete compliance.

Table 3.4 displays the structure of the Governance Index and the provisions of the Combined Code that are used to structure the index. These provisions include the structure of the board of directors and its sub-committees, namely: audit committees, nomination committees and remuneration committees. Further, the Table shows accurate definitions of the index coding and how variables are measured. In addition, the elements of the Governance Index are more inclusive compared with previous UK studies that used a governance index. For instance, Padgett and Shabbir (2005) compose a non-compliance index of only 12 provisions selected from the Combined Code of 1998. Similarly, Arcot and Bruno (2007), who employ eight provisions of the Combined Code to build their governance index.

However, there is an important limitation in the governance index, which is that it only covers all provisions of the Code that can be logically measured; it ignores others which cannot practically be measured. For example, provision A.5 of the Code states that *"The board should be supplied in a timely manner with information in a form and of a quality appropriate to enable it to discharge its duties"*; and provision D.1 states that *"There should be a dialogue with shareholders based on the mutual understanding of objectives. The board as a whole has responsibility for ensuring that a satisfactory dialogue with shareholders takes place"*. Practically, it is difficult to differentiate between companies in this regard for a relatively big sample size over a quite long period of time, so the index does not cover these corporate governance aspects.

Table 3. 4 Definition of Corporate Governance Variables and the Governance Index

Corporate Governance Variable	Acronym	Code section(s) / Page No.	Explanation
1. Board of Directors			
Chairman and CEO	*DUAL*	A.2.1(P.6)	A dummy variable equal to 1 if the roles of chairman and chief executive are combined, 0 otherwise.
Board Structure	*NED*	A.3.2(P.7)	A dummy variable equal to 1 if half or more of directors on Board of Directors are independent non-executive directors, 0 otherwise.
Chairman	*CHA*	A.2.2(P.6)	A dummy variable equal to 1 if the board chairman is independent non-executive director, 0 otherwise.
Senior independent director	*SEN*	A.3.3(P.8)	A dummy variable equal to 1 if the firm has independent non-executive directors as a senior independent director, 0 otherwise.
2. Board Sub-Committees			
Remuneration Committee			
Presence	*RC*	A.1.2 & B.2.1(P.6 & P.15)	A dummy variable equal to 1 if the company has a remuneration committee, 0 otherwise.
Structure	*RCS*	B.2.1 (P.15)	A dummy variable equal to 1 if the remuneration committee has three independent non-executive directors or more, 0 otherwise.
Chairman of remuneration committee	*CRC*	B.2.1 (P.65)	A dummy variable equal to 1 if the chairman of the remuneration committee is independent, 0 otherwise.
Audit Committee			
Presence	*AC*	C.3.1 (P.17)	A dummy variable equal to 1 if the company has an audit committee, 0 otherwise.
Structure	*ACS*	C.3.1 (P.17)	A dummy variable equal to 1 if the audit committee has three independent non-executive directors or more, 0 otherwise.
Financial expert	*ACF*	C.3.1 (P.17)	A dummy variable equal to 1 if the audit committee has at least one financial expert, 0 otherwise.
Chairman	*CAC*	C.3.1 (P.17)	A dummy variable equal to 1 if the chairman of the audit committee is independent, 0 otherwise.
Meetings	*ACM*	C.3 (P.17)	A dummy variable equal to 1 if the audit committee holds at least three meetings a year, 0 otherwise.
Nomination Committee			
Presence	*NC*	A.4.1 (P.67)	A dummy variable equal to 1 if the company has a nomination committee, 0 otherwise.
Structure	*NCS*	A.4.1(P.67)	A dummy variable equal to 1 if the more than half of members of nomination committee are independent non-executive directors, 0 otherwise.
Chairman	*CNC*	A.4.1(P.67)	A dummy variable equal to 1 if the chairman of the nomination committee is independent, 0 otherwise.

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3.4 Descriptive Statistics

This section shows descriptive analyses of dependent, independent and control variables. Table 3.5 shows the descriptive statistics for the variables of this study over an eleven-year period. The Table displays the mean, median, standard deviation, skewness, kurtosis, and minimum and maximum values for each variable. As can be seen from the Table, after winsorisation the return on assets *(ROA)* ranges between a minimum of -58.13 to a maximum of 33.48, with an average of 4.71 for the whole sample over the period. Furthermore, the standard deviation of *ROA* is 12.95, suggesting that there is a significant variation in the *ROA*. In addition, Tobin's Q *(TQ)* after winsorisation ranges from a minimum of 0.050 to a maximum of 1.488, with an average of 0.579 for the whole period. The standard deviation is 0.204, suggesting that the data is very close to the mean.

However, the skewness and kurtosis statistics suggest that Tobin's Q and ROA are mildly non-normal (the absolute critical value for accepting skewness is zero). For example, the skewness of ROA is negative (-2.061), indicating that the distribution tends to have longer than a normal left tail. Similarly, the skewness statistic of Tobin's Q seems to have the opposite direction but with less value: it is positive and equal to 0.552. Nonetheless, the kurtosis statistics of Tobin's Q and ROA are positive, but the kurtosis statistic of ROA is more than the absolute critical value, which is three, and this is also the case for Tobin's Q. This indicates that the distribution is mildly non-normal, and the positive sign of both values suggests that the both variables have longer tails than that of a normal distribution. However, the non-normal distribution by the variables has been indicated in prior studies that have examined the relationship between corporate governance and corporate performance (Cheung and Wei, 2006, Haniffa and Hudaib, 2006, Francoeur *et al.*, 2008).

Table 3. 5 Descriptive Statistics of the Independent Variables

	Mean	Median	Standard Deviation	Kurtosis	Skewness	Min	Max
ROA	4.712	6.540	12.947	7.346	-2.062	-58.130	33.480
TQ	0.579	0.582	0.240	1.686	0.552	0.050	1.488
NED	0.563	0.571	0.131	-0.399	-0.087	0.250	0.857
DUAL	0.060	0.000	0.238	11.641	3.693	0.000	1.000
BSIZE	8.131	8.000	2.633	0.950	0.963	4.000	17.000
MOWNER	0.069	0.005	0.159	10.255	3.202	0.000	0.804
AC	0.988	1.000	0.108	79.355	-9.017	0.000	1.000
RC	0.976	1.000	0.153	36.740	-6.223	0.000	1.000
NC	0.852	1.000	0.355	1.929	-1.982	0.000	1.000
GI	0.822	0.867	0.181	1.745	-1.293	0.000	1.000
SALESG	0.150	0.076	0.395	18.469	3.635	-0.536	2.637
CAPITE	0.054	0.039	0.052	4.368	1.941	0.000	0.270
FSIZE	5.558	5.488	0.818	-0.143	0.203	3.595	7.560
LEV	0.210	0.188	0.179	0.499	0.878	0.000	0.794
R&D	0.025	0.000	0.063	15.779	3.758	0.000	0.394

Table 3.5 also presents the descriptive analyses of corporate governance mechanisms, which this study examines. The figures present the percentage of non-executive directors *(NED)* on the board, which is on average 56% for the sample. This percentage ranges between a minimum of 25% to a maximum of 86%. These figures are in line with the prior UK corporate governance studies that have found similar results. Dahya et al., (2009b) report that the average percentage of NEDs for UK listed firms has increased from 30% in 1989 to 48% in 1996. Likewise, Ozkan (2007) reports that the percentage of non-executive directors on the board is 55.6 for 414 UK firms in 2003/2004. Further, Vafeas and Theodorou (1998) find that the percentage of non-executive directors on the board is 33% for 250 UK firms in 1994.

The Table also shows that board size *(BSIZE)* for UK listed companies ranges between a minimum of 4 to a maximum of 17 directors, with an average size of 8.131. This average follows the desirable board size, which has been recommended by Lipton & Lorsch (1992) to be between eight and ten directors, so that the board can fulfil its responsibilities

efficiently and effectively. However, the Combined Code on Corporate Governance does not recommend a specific number of directors to be appointed on the board; rather, it states that *"the board should not be so large as to be unwieldy. The board should be of sufficient size that the balance of skills and experience is appropriate"* (Financial Reporting Council, 2003). The board size is also consistent with the results of prior UK corporate governance studies. Using a panel data of eight years, from 1989 to 1996, Dahya, Garcia, and Bommel (2009b) report that the number of directors on UK corporate boards ranges between 6.90 to 8.20, with an average of 7.6 over the whole period. Similarly, Vafeas and Theodorou (1998) find that, in 1994, the average board size of 250 UK listed firms is eight directors. Finally, using 1631 UK quoted firms Conyon and Mallin (1997) report that, again in 1994, the average board size is 7.08.

In addition, Table 3.5 shows director ownership by executive and non-executive directors on the board. It reveals that director ownership is about 7%, on average, and it ranges between a maximum of 80% to a minimum of 0%. This is consistent with the results of prior UK corporate governance studies. For example, McKnight and Weir (2009) report that the average of director ownership ranges between 4% to 5% over the period from 1996 to 2000. In contrast, Young (2000) reports a highly significant director ownership (9.2%) for 470 UK listed firms in 1991. However, it is worth mentioning that the recommendations of UK corporate governance do not indicate a specific range regarding to what extent the managers on the board should have hold shares in their firm.

Furthermore, Table 3.5 shows to what extent UK listed firms have established board sub-committees: namely audit committee, remuneration committees and nomination committees. Clearly, audit committees have been widely formed with the highest mean (0.988) among other board sub-committees. However, as will be presented in later chapters, there are certain aspects of audit committees that have shown a low level of compliance despite the wide establishment of these committees. For example, less than 50% of audit committees in UK listed firms have held three meetings or more per year, as recommended by the Combined Code on Corporate Governance (2003). Additionally, the table contains descriptive statistics for the governance index, which shows a high level of

compliance, with an average of 82% over the period. However, the sample includes firms that complied completely with the Code, with a maximum level of compliance of 100%, and those who recorded complete non-compliance with a minimum of 0%. Finally, Table 3.5 contains descriptive statistics for control variables, namely sales growth, capital expenditure, firm size and leverage. Sales growth ranges from 264% to -54% with an average of 15%. Further, firm size is represented by a natural logarithm of a company's total assets at the end of the financial year. This figure ranges between 3.595 (3935.501 million) to 7.560 (3630785 million).

It is important to know to what extent the variables of this study are correlated. A correlation matrix for the variables is used to test the multicollinearity assumption. Table 3.6 presents a correlation matrix for corporate performance variables, corporate governance variables and control variables. As has been shown in Table 3.5, the skewness and kurtosis statistics indicate that there is a general mild non-normal trend in the variables. Table 3.6 reports that the highest correlation among independent and control variables is between board size *(BSIZE)* and firm size *(FSIZE)* (0.573). Since the highest correlation is less than 0.80, therefore, as has been suggested by Gujarati (2004), multicollinearity is not a problem. Therefore, the results of this study will not be affected by any data problems. These coefficients are also similar to those that have been reported in previous studies (Cheung and Wei, 2006, Haniffa and Hudaib, 2006, Francoeur *et al.*, 2008).

Furthermore, the high correlation between the board size and firm size suggests that, generally, large companies seem to have large sized board of directors. In addition, as has been predicted, the percentage of non-executive directors on the board *(NED)* is positively correlated with the establishment of board sub-committees; while duality *(DUAL)* is negatively correlated to the presence of non-executive directors on the board. This suggests that companies with a higher percentage of non-executive directors on the board are likely to have better corporate governance system than are other companies. This result is consistent with theoretical and empirical evidence that finds having more non-executive

directors on the board can play a role in improving the corporate governance system in a firm (See for example, Kini *et al.*, 1995, Bhagat and Black, 1999, Core *et al.*, 1999).

As was expected, the governance index is positively associated with both measures of corporate performance, which are return on assets *(ROA)* and Tobin's Q *(TQ)*. This indicates that companies with a high score of the governance index are expected to perform better than other companies that have a low score of the governance index. Empirically, this is consistent with prior corporate governance studies. For example, using 245 UK non-financial companies over the period 1998 to 2004, Arcot and Bruno (2007) report a positive coefficient between return on assets *(ROA)* and their corporate governance index. Similarly, Shabbir (2008) reports the same results for 115 UK non-financial companies over the period from 2000 to 2003.

Table 3. 6 Correlation Matrix of Corporate Performance and Corporate Governance Variables

	ROA	TQ	NED	DUAL	BSIZE	MOWNER	AC	RC	NC	GI	SALESG	CAPITE	FSIZE	LEV
ROA	1													
TQ	0.049*	1												
NED	-0.003	0.064*	1											
DUAL	0.031	-0.03	-0.173*	1										
BSIZE	0.099*	0.136*	0.09*	-0.04*	1									
MOWNER	0.007	-0.151*	-0.233*	0.105*	-0.148*	1								
AC	0.012	0.094*	0.155*	-0.183*	0.085*	-0.095*	1							
RC	0.031	0.103*	0.058*	-0.109*	-0.027	-0.01	0.528*	1						
NC	0.161*	0.132*	0.228*	-0.142*	0.232*	-0.166*	0.257*	0.158*	1					
GI	0.119*	0.136*	0.526*	-0.305*	0.221*	-0.268*	0.402*	0.33*	0.691*	1				
SALESG	-0.045*	-0.118*	-0.051*	0.044*	-0.003	0.087*	-0.023	-0.021	-0.117*	-0.118*	1			
CAPITE	0.129*	-0.03	-0.047*	0.072*	0.033*	0.063*	-0.008	0.022	-0.049*	-0.039*	0.033*	1		
FSIZE	0.258*	0.245*	0.287*	-0.064*	0.574*	-0.352*	0.109*	0.002	0.359*	0.386*	-0.102*	0.033*	1	
LEV	0.017	0.65*	0.118*	-0.052*	0.154*	-0.168*	0.079*	0.054*	0.106*	0.155*	-0.048*	0.104*	0.344*	1

*the value is significant at 95%

3.5 Empirical Design

This study uses a panel dataset, where data about the observed variables are collected for a number of firms n, over a long period of time t. Thus, the data represents a time series of cross-sectional data. Traditionally, the period of time t is less than the number of individual firms n. Therefore, the econometric techniques that are suitable for time-series data are not suitable to be used in panel dataset. Meanwhile, such a panel dataset can be examined by using a technique of time-series data (Gujarati, 2004, Wang, 2009). Suppose that a firm i, is observed over a period of time t, and K is a number of independent variables $x_1, x_2 \dots x_k$, and dependent variable y_{it}, then the panel data model in its general structure can be structured as follows

$$X_{it} = \beta_1 + \beta_2 X_{2it} + \cdots + \beta_k X_{kit} + \mu_{it} \qquad (1)$$

$i = 1, 2 \dots i$

$t = 1, 2 \dots t$

$k > 1$

$E(\mu_{it}) \sim N(0, \sigma^2)$

Using panel dataset has a number of advantages. First, using panel data controls for heterogeneity since the data includes observations for a number of companies over a period of time. Second, *"panel data give more informative data, more variability, less collinearity among the variables, more degrees of freedom and more efficiency"* (Baltagi, 2005). Third, studies that use panel data are better in investigating the dynamics of adjustment. Fourth, panel datasets have the ability to capture effects that cannot be detected in pure time-series data or pure cross-section. For example, the impact of changes in firm performance needs to be examined over a period of time, since it is difficult to find out the impact of any change in corporate governance on corporate performance in cross-section. Fifth, an empirical study that uses panel data has the ability to examine more complicated behavioural models. Finally, the panel dataset conducted on individuals over a long period

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of time reduces the possible bias that may be the outcome if the data are aggregated (Baltagi, 2005, Wang, 2009).

Few studies on UK corporate governance have used panel data to examine the relationship between corporate governance and corporate performance (Short and Keasey, 1999, Ozkan and Ozkan, 2004, Guest, 2008, Guest, 2009, McKnight and Weir, 2009). Furthermore, none of the above mentioned studies have used the most up-to-date and comprehensive data, which makes this study different from the existing studies on corporate governance in the UK. Also, the majority of the above mentioned studies have used data up to 2002. In addition, none of the above studies have included a corporate governance index in their empirical investigation to measure whether compliance of UK firms with the recommendations of the Combined Code on Corporate Governance is a determinant of firms' value.

The majority of existing empirical studies on corporate governance have modelled corporate performance as a function of corporate governance mechanisms. These empirical studies often face several serious methodological problems related to endogeneity (Guest, 2009, Wintoki et al., 2012). First, the presence of unobserved heterogeneity, which occurs when corporate performance and a specific corporate governance mechanism are jointly determined by an observed firm-specific variable. This problem can be solved by using a fixed effect regression model. Second, a simultaneous endogeneity problem arises when a specific corporate governance variable and corporate performance may be simultaneously determined. Also, a dynamic endogeneity problem may occur as a result of a specific corporate governance variable which is determined by the past corporate performance. A number of studies have attempted to employ an instrumental variable to address this problem (See for example, Eisenberg et al., 1998, Adams and Mehran, 2005, Bennedsen et al., 2008). However, although employing instrumental variable regressions can possibly mitigate endogeneity, this requires a strict definition for instrumental variables, which is difficult, in practice, since it is difficult to find an instrumental variable that is not affected by any of the firm's characteristics (Wintoki et al., 2012).

Therefore, it can be argued that examining the relationship between corporate governance mechanisms and corporate performance by employing fixed effects models or instrumental variable regressions can lead to biased findings. In order to mitigate the endogeneity problem, Wintoki *et al.* (2012) suggest that using the GMM estimator would be appropriate to examine the relationship between corporate governance and corporate performance. However, Wintoki *et al.* (2012) have not included other corporate governance mechanisms that empirically have an impact on corporate performance, such as director ownership and presence of board sub-committees. Further, they have not employed a corporate governance index among their variables. In addition, there are a few corporate governance studies that have developed a corporate governance index to measure the extent to which firms have complied with corporate governance recommendations in the UK (Padgett and Shabbir, 2005, Arcot and Bruno, 2007). However, these studies have only focused on a limited period of time, four years and less, and have used ordinary least square regression to analyse their data. This study attempts to bridge this gap by examining an eleven-year period of time, from 1999 to 2009, using GMM to find out the impact of corporate governance mechanisms on corporate performance.

Based on the discussion above, the following models, which will be examined in the empirical chapters, were framed. The first model is:

$$CP_{it} = \alpha_0 + \beta_1 NED_{it} + \beta_2 DUAL_{it} + \beta_3 BSIZE_{it} + \beta_4 MOWNER_{it} + \beta_5 AC_{it} + \beta_6 RC_{it}$$
$$+ \beta_7 NC_{it} + \sum_{i=1}^{n} \beta_i\, Control.V$$
$$+ \varepsilon_{it} \tag{2}$$

The second model will examine the relationship between the governance index and corporate performance:

$$CP_{it} = \alpha_0 + \beta_1 GI_{it} + \sum_{i=1}^{n} \beta_i\, Control.V + \varepsilon_{it} \tag{3}$$

Where:

CP = independent variables, which are Tobin's Q (TQ) and return on assets (ROA) as measures of corporate performance.

GI = the governance index

α_0 = constant term

NED = the ratio of non-executive directors on the board to the total number of directors

DUAL = a dummy variable equal to 1 - the roles of CEO and chairman are combined, 0 otherwise.

BSIZE = total number of directors on the board at the end of a financial year

MOWNER = director ownership

AC = a dummy variable is equal to 1 if a firm has an audit committee and 0 otherwise.

RC = a dummy variable is equal to 1 if a firm has a remuneration committee and 0 otherwise.

NC = a dummy variable is equal to 1 if a firm has a nomination committee and 0 otherwise.

Control.V = Control variables for sales growth (*SALESG*), capital expenditure (*CAPITE*), firm size (*FSIZE*), industry sector (*IN0, IN1 ... IN9*), year (*Y1, Y2 ... Y11*).

ε = Error term

3.6 Summary

This chapter describes the research methodology and the procedure of data collection. It aims to cover four key related objectives. First of all, it explains the procedure of data collection and the source from which the data were collected. In this regard, two types of data were collected: corporate governance data and financial data. Corporate governance data were collected from different sources: the *BoardEx* database and annual reports; and financial data were collected from the *Datastream* database. The data collection covers an

eleven-year period of time, from 1999 to 2009 for UK listed companies in the FTSE-All Index in the London Stock Exchange.

Second, this chapter describes the dependent, independent and control variables and how to measure each one of them. This includes explanation of the measuring of corporate performance, namely return on assets and Tobin's Q. These two corporate performance measures have been intensively used in previous corporate governance studies. Therefore, the results of this study will be comparable with others in this field. Furthermore, this chapter explains the independent variables that represent the characteristics of the board of directors and the corporate governance index. The focus of characteristics of the board of directors and the governance index is due to changes in the corporate governance recommendations over the last decade; for example, the Higgs Review (2003), which suggests listed firms should include more non-executive directors on the board. Also, the Smith Review (2003), which emphasises the crucial role of audit committees and their characteristics.

Finally, this chapter aims to explain the empirical design of the data analysis and regression models. Following Wintoki *et al.* (2012),this study employs the generalised method of moments to examine the relationship between corporate governance and corporate performance. This model enables the researcher to examine the dynamic impact of corporate governance and corporate performance and vice versa. A considerable number of corporate governance studies suggest that certain corporate governance mechanisms have a positive impact on corporate governance, but this study attempts to focus more on the endogeneity problem. This is because it is difficult to ensure that corporate governance mechanisms affect corporate performance and that this relationship is not reversed.

Chapter 4

Compliance with the Corporate Governance Recommendations and its Impact on Corporate Performance

Introduction

This chapter focuses mainly on the impact of compliance with the corporate governance recommendations on corporate performance. Compliance with corporate governance recommendations is measured by a governance index that is structured by using the Combined Code on Corporate Governance (2003). This chapter aims to describe the data of the governance index by displaying the main descriptive statistical measures. Further, it will also report to what extent UK firms have complied with the governance index, and describe the observed changes in compliance with the governance index. In order to have a meaningful explanation, the sample of this study is divided into two categories based on firms' size and industry, so that compliance with the governance index can be explained in the light of these two categories.

In addition, this chapter examines the impact of compliance with the corporate governance recommendations on corporate performance by using different types of regressions. This enables the researcher to discover the ability of different regressions to capture the impact of corporate governance on corporate performance. These different regressions mainly aim to examine the link between the relationship between corporate governance and corporate performance, based on ordinary least square regression, fixed-effects regression and generalised method of moments. However, this study measures corporate performance by return on assets (ROA) and Tobin's Q, which have been heavily used in previous literature to measure corporate performance. The use of these two measures makes the results of this study comparable with the results of prior studies in the UK and other countries.

This chapter is organised as follows. Section 4.1 discusses the main hypothesis of this chapter, focusing on the possible impact of the level of compliance with corporate governance recommendations on corporate performance. Section 4.2 reports descriptive statistics of the compliance level of the governance index, describing the changes in the

aspects of corporate governance in UK listed firms over the period of this study. Section 4.3 examines the relationship between the corporate governance, measured by the governance index developed in the previous chapter, and corporate performance. The final section, 5.5, summarises the main results of the descriptive statistics and regression model.

4.1 Hypothesis Development

There are a considerable number of corporate governance studies that have examined the impact of specific corporate governance mechanisms on corporate performance. These mechanisms include the size of boards of directors; structure of the board; presence of board sub-committees and their independence; duality of CEO and board chairman; and remuneration of directors. The literature has reported conflicting findings regarding the relationship between individual corporate governance mechanisms and corporate performance. These conflicting conclusions may arise from inter-relationship between corporate governance mechanisms. Furthermore, the optimal level of corporate governance mechanisms may be different between companies, causing different findings for a different sample of companies. The inconclusive empirical evidence on the impact of corporate governance on corporate performance has led to the governance index approach to examine this relationship. The structure of these indices depends on ranking the corporate governance system for each firm according to its level of compliance with corporate governance regulations.

A number of empirical studies have employed a governance index and examined corporate governance as a set. The first attempt to employ an index in corporate governance studies was conducted by Gompers *et al.* (2003). Their findings show a positive relationship between stronger shareholder rights, measured by an index based on 24 anti-takeover provisions; and corporate performance, measured by Tobin's Q, for US firms. They also report share returns and sales growth are likely to be higher for companies with stronger shareholder rights than for other US firms. However, Bebchuk *et al.* (2009) indicate that the findings of Gompers *et al.* (2003) are likely to be affected by being time-period specific, with weaker findings observed over an extended time-period.

Black (2001) finds that his corporate governance index is positively related to corporate performance for Russian firms. Likewise, Black *et al.* (2006b) report a positive relationship between the score of their corporate governance index and Korean firm value listed on the Korean Stock Exchange in 2001. These findings are backed by Black *et al.* (2006c). who used time-series empirical evidence. Cremers and Nair (2005) report that external governance mechanisms, measured by an index of takeover vulnerability; and internal corporate governance mechanisms, measured by institutional blockholder and public pension fund, play a complementary role in increasing abnormal share returns, and conversely role on affecting firm value, measured by Tobin's Q. Larcker *et al.* (2007) employ principal component analysis to examine the impact of 14 corporate governance indices structured by 39 corporate governance provisions, and document that their indices are related to future operating performance and excess stock returns, but have no relation to abnormal accruals and accounting restatements.

However, there are a limited number of UK studies based on the governance index. One example is the study by Padgett and Shabbir (2005), who find a positive relationship between compliance with the recommendations of corporate governance, measured by a non-compliance index, and corporate performance measured by total share return. Arcot and Bruno (2007) find that a high level of compliance with the corporate governance best practice, measured by a governance index, has no impact on corporate performance, measured by return on assets and Tobin's Q. In addition, no prior UK studies have employed panel dataset in a context similar to the current study, which is one of the main contributions of this research. Furthermore, all the prior corporate governance studies that have used the governance index approach have not employed generalised method of moment to examine the impact of the governance index on corporate performance.

This study aims to evaluate corporate governance characteristics based on the Combined Code on Corporate Governance recommendations in the UK, represented by a governance index. As it is not possible to totally examine the level of compliance with these recommendations, either individually or collectively, on an ex ante basis, concentration is based on structuring a governance index that has been considered in the literature to be

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potentially value-relevant. As has been explained in the previous chapter, the governance index of this study includes fifteen corporate governance recommendations. Four recommendations are related to the board of directors' structure, while eleven relate to board sub-committees and their characteristics. The main task of the governance index is to measure compliance with the corporate governance recommendations as a set rather than independently examining each corporate governance mechanism.

However, the vast majority of prior corporate governance studies that used a governance index have a number of limitations. First of all, they use a short period of time to examine the relationship between the governance index and corporate performance. For example, in the UK, Padgett and Shabbir (2005) examine the impact of a non-compliance index on firm performance for a four-year period of time, from 2000 to 2003, for a small sample of 100 firms. Arcot and Bruno (2007) investigate the impact of their governance index on corporate performance for only one year (2003). Second, it has been argued that the relationship between corporate governance and corporate performance is dynamic in nature. This suggests that the past corporate performance may affect the current corporate governance and vice versa (Guest, 2009, Wintoki *et al.*, 2012). So far, all the published corporate governance studies that employed a governance index have ignored the possibility that corporate governance and corporate performance are likely to be dynamic. All the previous studies that used a governance index have employed either ordinary least square regressions or fixed-effects regressions to find out the impact of compliance on corporate performance. Neither method can capture this impact, due to the dynamic nature of the governance/performance relationship, as suggested by Wintoki *et al.* (2012).

To address the issues mentioned above, this study examines the relationship between corporate governance and corporate performance for UK listed companies. There are several reasons for doing so. First, the investigation of corporate governance in a flexible regime, as the UK offers a good environment since the corporate governance regulations are optional and each firm can select the suitable one for its governance system. Second, the corporate governance regime in the UK, unlike US regime that adopts a legal approach, is voluntary, and this voluntary approach has been adopted internationally, creating an

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interesting area to examine from a policy perspective. Finally, this study improves on the methods of analysis by applying GMM to address the concerns expressed above regarding the endogeneity of the variables. This method has not yet been applied by published papers that studied the effect of compliance with governance regulations on the firm's value (See for example, Gillan *et al.*, 2003, Gompers *et al.*, 2003, Klapper and Love, 2004, Bhagat and Bolton, 2008, Black *et al.*, 2011).

As has been explained in the literature review chapter, the governance index of this study includes 15 provisions of the corporate governance code. The general expectations from complying with the Combined Code on Corporate Governance provisions are to reduce agency costs and improve corporate governance. These expectations are consistent with agency theory as described in Fama and Jensen (1983b), Fama and Jensen (1983a), and Jensen (1986), among others. Furthermore, managerial signalling theory indicates that complying with the code of corporate governance is a primary sign by management to markets that the management follows better corporate governance structure. This can lead to increased demand for shares by investors, which means an increase in the wealth of the shareholders (La Porta *et al.*, 2002, Beiner *et al.*, 2006). Consequently, it is expected that companies that adopt the recommendations of the combined code are likely to have a higher corporate performance than companies that have not done so.

Given the general expectations of complying with corporate governance provisions, it is expected that more compliance with the recommendations of the Combined Code should be accompanied by an increase in the corporate performance. This study measures the compliance of UK listed companies by a governance index developed in section 3.2.4 of the previous chapter. Therefore, a higher governance index score should have a positive impact on corporate performance, so the following hypothesis is proposed:

Hypothesis 1: There is a positive relationship between the governance index and corporate performance.

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4.2 Descriptive Analysis

Table 4.1 shows the extent of compliance by UK listed companies in this study's sample with fifteen corporate governance provisions from the Combined Code on Corporate Governance (2003, 2006, 2008), which constructed the governance index of this study. In order to simplify the comparison, the compliance level is shown as a percentage for each provision of the index over the period. Two main observations can be clearly seen from Table 4.1. First of all, there are dramatic changes in the level of compliance with the Combined Code recommendations over the period. The level of compliance varies between about 99% in the case of established audit committees, which means a high level of compliance by listed firms over the period; and less than 50% regarding the number of meetings held by audit committees per year, which means a low level of compliance.

Table 4. 1 The Compliance Level with the Combined Code

Corporate Governance Variable		Average	Compliance level over the period										
			1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
1. Board of Directors													
Chairman and CEO (Duality)	DUAL	0.936	0.889	0.908	0.914	0.926	0.942	0.931	0.935	0.948	0.971	0.964	0.966
Board Structure	NED	0.756	0.585	0.61	0.656	0.657	0.735	0.774	0.805	0.844	0.879	0.891	0.88
Independent chairman	CHA	0.739	0.645	0.652	0.682	0.688	0.726	0.744	0.766	0.794	0.805	0.82	0.808
Senior independent director	SEN	0.789	0.581	0.631	0.709	0.769	0.828	0.884	0.868	0.878	0.79	0.881	0.862
2. Board Sub-Committees													
Remuneration Committee													
Presence	RC	0.974	0.949	0.961	0.967	0.972	0.983	0.981	0.974	0.978	0.976	0.988	0.99
Structure	RCS	0.805	0.744	0.762	0.788	0.83	0.81	0.802	0.79	0.811	0.833	0.85	0.838
Independent chairman	CRC	0.946	0.855	0.908	0.921	0.954	0.968	0.959	0.951	0.965	0.971	0.976	0.978
Audit Committee													
Presence	AC	0.987	0.974	0.986	0.987	0.988	0.988	0.989	0.982	0.988	0.988	0.995	0.998
Structure	ACS	0.798	0.761	0.791	0.815	0.843	0.834	0.821	0.782	0.779	0.79	0.767	0.796
Financial expert	ACF	0.63	0.415	0.511	0.543	0.559	0.592	0.628	0.706	0.727	0.735	0.757	0.759
Independent chairman	CAC	0.955	0.889	0.94	0.954	0.969	0.971	0.961	0.956	0.963	0.969	0.976	0.956
Three meetings or more	ACM	0.493	0.145	0.206	0.225	0.33	0.466	0.554	0.639	0.653	0.655	0.767	0.784
Nomination Committee													
Presence	NC	0.842	0.756	0.727	0.762	0.787	0.837	0.89	0.883	0.881	0.893	0.91	0.931
Structure	NCS	0.819	0.692	0.677	0.728	0.778	0.819	0.871	0.868	0.864	0.886	0.903	0.921
Independent chairman	CNC	0.702	0.556	0.55	0.603	0.636	0.708	0.755	0.74	0.749	0.802	0.82	0.799
Average		79.8%	69.0%	71.5%	74.2%	77.1%	80.2%	82.2%	82.8%	83.8%	84.5%	86.5%	86.6%

However, a high level of compliance proves that listed companies follow the recommendations of the Combined Code on Corporate Governance. These recommendations require every listed company to have an independent board of directors and independent board sub-committees. On the other hand, the decrease in the level of compliance is an undesirable indicator in terms of the Code's recommendations. A possible explanation for this may be that some corporate governance mechanisms are suggested as a response to financial scandals without considering how such mechanisms work in practice (Spira, 2006). However, research methodology in corporate governance, as will be explained later in this chapter and as was explained in Chapter Three, link only one mechanism of corporate governance to corporate performance, without taking into account the variation in other mechanisms; this could lead to unclear findings, which the index approach attempts to avoid in this study. It has been also suggested that, because compliance with the UK corporate governance code is voluntary, listed firms can select what is suitable for them without complying with all the recommendations, but they have to justify the alternative measures that they have taken. Another reason for a low level of compliance is that, as long as share price does not decrease, investors tolerate non-compliance (MacNeil and Xiao, 2006).

The second main observation from Table 4.1 is that UK listed firms generally seem to adopt the recommendations of the Code over time. It can be seen from Table 4.1 that there is a clear development in the level of compliance with the Combined Code of Corporate Governance in the whole listed firms over the period from 1999 to 2009. The governance index has increased in all its corporate governance aspects over time. For example, appointing an independent non-executive director as a senior member of the board has increased from just over 58% in 1999 to 88% in 2008. This significant change is clearer in the characteristics of audit committees. The Table shows that the number of audit committees holding three meetings or more per year has risen from just over 14% in 1999 to about 78% in 2009. Further, having a financial expert among the audit committees' members has increased from 41% in 1999 to 76% in 2009. Also, a noticeable development

is the appointment of an independent non-executive director as a chairman of the nomination committees. Only 55% complied with that in 1999, whereas this figure reached about 80% in 2009. These changes are consistent with the requirements of the Combined Code of Corporate Governance.

However, despite the general improvement in the level of compliance with the corporate governance requirements, as Table 4.1 shows, this level is likely to be different for each corporate governance aspect. For example, while more than 98% of the sampled firms have established audit committees, only 63% of them have a financial expert among their members. Further, whereas 93.6% of UK firms have separated the roles of CEO and board chairman, only 73.9% of them have an independent non-executive director as a board chairman.

Furthermore, these improvements in the level of compliance are over the findings of previous studies that investigated corporate governance in UK firms. Weir and Laing (2000) report that firms that combined the role of CEO and chairman were 15% in 1995, and 95% of UK listed firms had remuneration committees in 1995. And only 50% had established a nomination committee in 1996 (Weir *et al.*, 2002). Collier and Gregory (1996) report that only 41.9% of their sample had an audit committee before 1991. However, Table 4.1 shows that in 2009 less than 4% of UK listed firms still combined the role of CEO and chairman; 99% had formed a remuneration committee; 93% had a nomination committee; and 99.8% had an audit committee. This suggests that there is a dramatic improvement in the level of compliance, compared with the findings of prior studies.

The increase in the Governancen Index
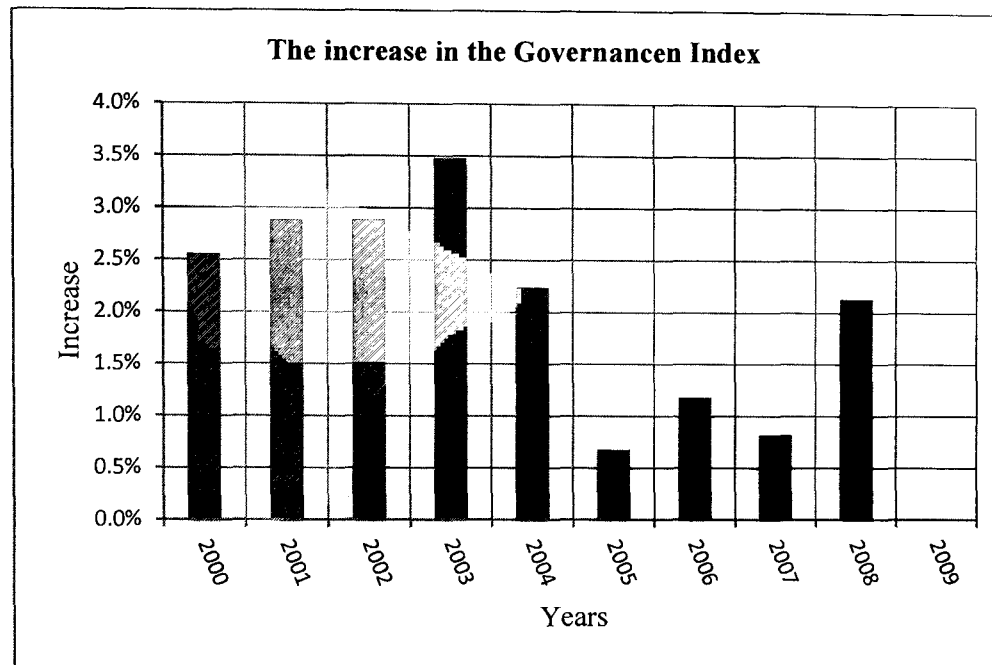
Figure 4. 1 Year-by-year Level Increase in the Governance Index

Figure 4.1 shows year-by-year increase in percentages in the level of compliance with the Governance Index of this study. The Figure demonstrates that there is an increase in the compliance with corporate governance recommendations in each year over the period. Second, in 2003 the governance index displayed the highest annual increase over the period, about 1% more than 2002; this may due to the 2003 publication of the Higgs Review and the Smith Review. Then the increase continues to fluctuate for the rest of the period.
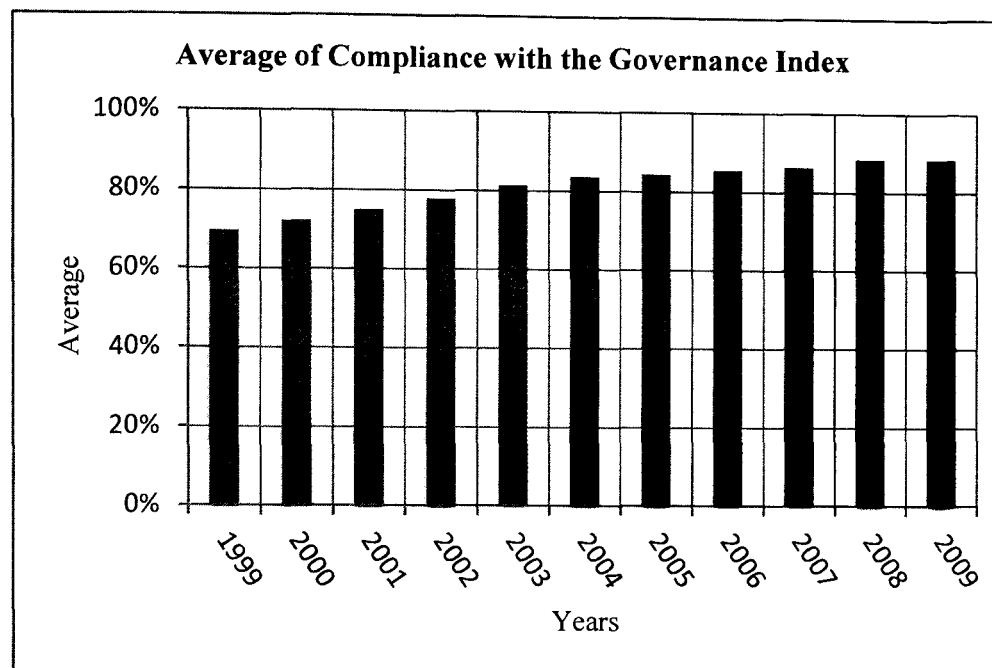
Figure 4. 2 Average of Compliance with the Governance Index

Figure 4.2 shows the change of the governance index over the period, using computed means. It is clear that the level of compliance with corporate governance recommendations increased over the period: it was about 70% in 1999; then it increased to reach about 88% in 2009. This suggests the level of compliance is positively associated with time, which prior studies have reported. For instance, Conyon (1994), Padgett and Shabbir (2005), Conyon and Mallin (1997) in the UK; Bauer et al. (2004) in Europe; and Cui et al. (2008), and Henry (2008) in Australia have reported a positive relationship between the level of compliance with the requirements of corporate governance over time.

Table 4.2 shows that descriptive statistics of the governance index for each of the eleven years are quite similar. From the Table is clear that there is a large variability in the level of compliance with the governance index over the period: it ranges between 0% to 100% over the period from 2000 to 2005; and between 7% to 100% in 1999, 2006, 2007, and 2008. Then it is quite higher for 2009: between 27% to 100%. Specifically, as Table 4.3, just over 26% of the sample of this study had a compliance level between 61% - 80%. Less level of compliance has been conducted by less number of listed firms. For example, about 3% of UK listed firms had a compliance level between 21% - 40%. In contrast, more than

58% of the sample had a compliance level between 81% and 100%. In addition, it can be seen that the governance index has the lowest mean, 0.696 in 1999, and then it has gradually risen over the rest of the period, suggesting that listed firms tend to comply over time. This tendency is supported by the figures of the mode rising from 0.867 in 1999 to 1 in 2009.

Table 4. 2 Descriptive of Governance Index

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mean	0.696	0.721	0.75	0.779	0.814	0.836	0.843	0.855	0.863	0.885	0.884
Standard Error	0.012	0.011	0.01	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.007
Median	0.733	0.733	0.8	0.8	0.867	0.867	0.867	0.933	0.933	0.933	0.933
Mode	0.867	0.867	0.867	0.867	1	1	1	1	1	1	1
Standard Deviation	0.187	0.185	0.174	0.17	0.172	0.178	0.184	0.18	0.163	0.153	0.147
Sample Variance	0.035	0.034	0.03	0.029	0.03	0.032	0.034	0.032	0.027	0.024	0.022
Kurtosis	0.425	0.91	1.393	1.794	1.769	3.272	3.003	2.619	3.491	4.029	2.643
Skewness	-0.823	-0.873	-0.977	-1.081	-1.228	-1.657	-1.652	-1.598	-1.709	-1.891	-1.634
Minimum	0.07	0	0	0	0.07	0	0	0.07	0.07	0.07	0.27
Maximum	1	1	1	1	1	1	1	1	1	1	1
Observations	234	282	302	324	343	363	385	403	419	411	407

Table 4. 3 Frequency of the Governance Index Scores

%	Observations	% of sample
0-20	39	1.0%
21-40	104	2.7%
41-60	447	11.5%
61-80	1021	26.4%
81-100	2262	58.4%
	3873	100%

The literature has suggested that corporate governance compliance differs between industrial sectors (see for example, Bauer et al., 2004; Black, Jang, & Kim, 2006; Botosan, 1997; Henry, 2008; Lang & Lundholm, 1993). Likewise, Padgett and Shabbir (2005)

indicate that the level of compliance with corporate governance recommendations among UK listed firms varies in different industrial groups. The difference in industry sectors seems to have an impact on the level of compliance. Athreye and Keeble (2000) find that the technology sector in the UK is dominated and managed by foreign ownership. They mention that the main motivation leading this trend is the growth potential of the company and the availability of skilled human resources. Therefore, the presence of blockholders gives control and power to these specific shareholders. As a result, they can impose on their companies the structure of corporate governance that benefits them the most. Furthermore, this type of firms is usually associated with high director ownership, because the blockholders serve as directors on the board or its subcommittees.

Table 4.4 shows the mean of the Governance Index for each industry over the period of this study. It based on based on one-digit of FTSE Industry Classification Benchmark (FTSE, 2008). It seems that industry concentration has its impact on the Governance Index trend. From the table it is clear that the Oil and Gas industry has the highest mean of the Index with an average of 90%, while the Technology industry has the lowest with an average of 73%. This trend means that the Oil and Gas industry is more compliant than other sectors among listed firms. The Basic Material industry, which includes chemicals, forestry and paper, industrial metals, and mining, comes second after the Oil and Gas industry with an average 86%. This suggests that the level of compliance is somehow correlated to the industry that a firm is in.

In addition, the mean shows a substantial increase for most sectors over the period from 1999 to 2009. For example, the mean of Telecommunication has increased from 57% in 1999 to 91% in 2009. This movement can be also seen for the mean of the Consumer Services industry, which includes retail, media, and travel and leisure: it has increased from 66% in 1999 to 85% in 2009. The changes in the mean of the Governance Index over the period in the table below could be as a result of a change in the number of companies in each sector. Another noticeable observation from Table 4.4 is that although the mean of the Governance Index in the majority of sectors has increased over the period, it is still systematically lower for some industries for the whole period, such as the technologies

industry. Athreye and Keeble (2000) find that the technology sector in the UK is dominated and marked by foreign ownership. They mention that the main motivation leading this trend is the growth potential of the company and the availability of skilled human resources. Therefore, the presence of blockholders puts the control and power into the hands of these specific shareholders. As a result, they can impose on their companies the structure of corporate governance that benefits them most.

Further, this type of firm is usually associated with high director ownership, because the blockholders serve as directors on the board of directors or its subcommittees. The impact of this structure of corporate governance on corporate performance is the main question that this study attempts to address. Table 4.4 also shows, in the Oil and Gas industry, the number of firms has slightly changed over the eleven years, while the number in the Technology industry has increased to more than double - from just 17 firms in 1999 to 42 firms in 2009. This is also the case with the Consumer Services industry, which has increased from 64 firms in 1999 to 115 in 2009. Unlike the Oil and Gas industry, the number of firms in the Telecommunications industry has slightly changed, from just 4 firms to 5 firms; but its governance index has shown a dramatic increase. Another noticeable observation from Table 4.4 is that, although the mean of the Governance Index in the majority of sectors has increased over the period, it is still systematically lower for some industries for the whole period, such as the Technology industry.

Table 4. 4 The mean of the Governance Index for each industry

Industry	Average	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Oil & Gas	0.9	0.8(7)*	0.81(7)	0.84(7)	0.92(7)	0.97(7)	0.96(7)	0.96(7)	0.9(8)	0.91(8)	0.91(8)	0.93(8)
Basic Materials	0.86	0.79(10)	0.77(15)	0.79(16)	0.83(17)	0.9(18)	0.88(19)	0.9(21)	0.89(22)	0.87(25)	0.92(24)	0.91(25)
Industrials	0.83	0.69(90)	0.73(106)	0.77(114)	0.79(121)	0.83(125)	0.86(133)	0.87(138)	0.88(142)	0.89(145)	0.92(143)	0.92(137)
Consumer Goods	0.84	0.72(23)	0.74(27)	0.8(27)	0.8(30)	0.81(30)	0.85(32)	0.87(32)	0.88(33)	0.89(34)	0.91(32)	0.93(33)
Health Care	0.83	0.75(13)	0.79(17)	0.78(17)	0.8(20)	0.83(22)	0.84(22)	0.84(24)	0.87(28)	0.88(28)	0.89(28)	0.88(27)
Consumer Services	0.78	0.66(64)	0.7(73)	0.71(80)	0.74(87)	0.79(93)	0.82(100)	0.82(106)	0.83(112)	0.84(117)	0.86(116)	0.85(115)
Telecommunications	0.81	0.57(4)	0.77(4)	0.78(4)	0.85(4)	0.83(4)	0.83(4)	0.79(5)	0.85(5)	0.84(5)	0.87(5)	0.91(5)
Utilities	0.82	0.76(6)	0.79(8)	0.83(9)	0.82(9)	0.83(10)	0.87(10)	0.8(14)	0.81(15)	0.85(15)	0.8(15)	0.84(15)
Technology	0.73	0.68(17)	0.61(25)	0.65(28)	0.7(29)	0.72(34)	0.72(36)	0.74(38)	0.77(38)	0.78(43)	0.81(41)	0.83(42)

The numbers in the brackets indicate to the number of companies in that industry in that year

4.3 The Relationship between the Governance Index and Corporate Performance

This section reports the empirical relationship between the governance index and corporate performance using the dynamic model adopted from Wintoki *et al.* (2012). Section 4.4.1 determines how many lags of corporate performance are needed to ensure dynamic completeness. Section 4.4.2 presents direct empirical evidence of the dynamic relationship between the governance index and the past corporate performance. Section 4.4.3 examines the relationship between the governance index and corporate performance using the dynamic panel GMM estimator. Finally, section 4.4.4 examines the validity of the instrument set which is used in the dynamic GMM estimation.

4.3.1 The Needed Lags for Dynamic Panel GMM Estimator

It has been suggested that, to capture the influences of the past on the current data, two lags are sufficient (Glen *et al.*, 2001, Gschwandtner, 2005, Wintoki *et al.*, 2012). To corroborate whether two lags are sufficient, the researcher follows Wintoki *et al.* (2012) by estimating a regression of current corporate performance on four lags, including other control variables explained in section 3.2.2 of Chapter Three; then any lag that is significant with both measure of corporate performance will be selected. In order to decide that, this study uses the following model:

$$CP_{it} = \alpha_1 + \sum_{p=1}^{p=4} k_p CP_{it-p} + kControl. v_{it} + \mu_i + \varepsilon_{it} \qquad (4.1)$$

Where CP_{it} represents corporate performance measured by return on assets (ROA) and Tobin's Q (TQ). *Control.* v_{it} represents control variables, which are sales growth (SALESG), capital expenditure (CAPITE), firm size (FSIZE), leverage (LEV), research and development (R&D), and year and industry dummies.

Table 4.5 shows the results of the Dynamic Panel GMM Estimator using two measures of corporate performance, which are ROA and TQ. Results indicate that the use of one lag is

sufficient to examine the dynamic nature of the relationship between corporate governance and corporate performance. As can be seen from columns 1 and 2 of Table 4.5, the one lag is statistically significant for both measures of corporate performance at 1%, whereas the other lags are significant for only one measure and not the other. For example, two lags are statistically significant with ROA, but not significant with Tobin's Q. In addition, all lags are positively related to ROA, while only one lag is significantly positively related to Tobin's Q. Furthermore, there is a significant relationship between all control variables and ROA; and only sales growth has no significant relation with Tobin's Q. Finally, R-square is 44% under ROA and 86% under Tobin's Q, indicating that Tobin's Q has more explanatory power than ROA in finding the right lag for the GMM estimator.

Table 4. 5: Dynamic Panel GMM Estimator to Test the Appropriateness of Lags on Corporate Performance

In this table, we report results from the OLS estimation of the model 5.1. All t-statistics are based on robust, firm-clustered standard errors. Year and industry dummies are included in all specifications. *, **, *** the relationship is significant at 10%, 5% and 1% respectively.

Dependent Variable	ROA	TQ
Performance (-1)	0.392***	0.737***
	(0.000)	(0.000)
Performance (-2)	0.126***	-0.028
	(0.000)	(0.407)
Performance (-3)	0.026***	0.140
	(0.002)	(0.887)
Performance (-4)	0.071**	-0.023
	(0.048)	(0.341)
SALESG	3.037***	0.002
	(0.000)	(0.129)
CAPITE	7.497***	-0.037***
	(0.000)	(0.000)
FSIZE	1.272***	-0.01***
	(0.000)	(0.000)
LEV	-6.536***	0.278***
	(0.000)	(0.000)
R&D	-26.143***	0.075***
	(0.000)	(0.000)
R-square	0.44	0.86

4.3.2 The Contemporaneous and Dynamic Relationship Among Variables

It has been argued that changes in governance structure and firm characteristics are associated with past corporate performance (Hermalin and Weisbach, 1988, Guest, 2009, Wintoki *et al.*, 2012). Based on this argument, the relationship between dependent, independent and control variables is examined directly using a number of tests. The first test examines both the current governance index and control variables, and changes in these levels on past corporate performance by using ordinary least square regression OLS. Table 4.6 shows the results of the first test. Panel A of Table 4.6 represents the results from OLS regression on level data of the governance index and control variables on past corporate performance, measured by ROA, and control variables from one year before. The results document that the current level of the governance index is significantly negatively influenced by past corporate performance and capital expenditure, whereas it is significantly negatively influenced by firm size and R&D expenses. Further, the current level of sales growth, firm size and R&D expenses is significantly determined by past ROA. The results indicate that firms that have had high ROA, sales growth and capital expenditure in the past will be larger today, as suggested by Fama and Jensen (1983a) and Boone *et al.* (2007).

Panel B of Table 4.6 shows the results from OLS regressions of changes in the governance index and control variables on the changes of corporate performance and control variables for one year before. The results are quite different to those obtained from using the levels as dependent variables. Changes in the governance index are only significantly related to past firm size and leverage, while the index is not influenced by the other variables. Furthermore, the results also show that changes in capital expenditure are significantly positively related to the past ROA and sales growth. Interestingly, the values of R-square in Panel B are significantly lower from those shown in Panel A. This suggests that the use of changes in the governance index and control variables reduces the explanatory power of the OLS regression.

Table 4. 6 OLS Relationship between the Corporate Governance Index, Control Variables, and Past ROA

This table reports the results of OLS regressions of current governance index *(GI)* and current control variables, on past performance and historic values of control variables. Performance is measured by return on assets *(ROA)*. The control variables include sales growth *(SALEG)*, capital expenditure *(CAPITE)*, firm size *(FSIZE)*, leverage *(LEV)* and R&D expenditure *(R&D)*. Panel A reports the results of the regressions in which the dependent variables are current levels. Panel B reports the results of the regression in which the dependent variable is the change from *t-1* to t. All *p-values* (in parentheses) are based on robust standard errors. Year and industry dummies are included in all specifications. Items with ***, **, or * are significant at the 1%, 5% and 10% respectively.

Panel (A) Dependent Variable at time *t*

	GI	SALESG	CAPITE	FSIZE	LEV	R&D
ROA(t-1)	-0.001*	0.001**	0.002	0.001***	-0.001	0.001**
	0.053	0.035	0.777	0.009	0.390	0.048
SALESG(t -1)	-0.008	0.014	0.418***	0.017**	-0.005	-0.009
	0.196	0.199	0.000	0.040	0.462	0.220
CAPITE(t -1)	-0.106***	0.319***	1.423*	0.179***	-0.017	0.023
	0.009	0.001	0.055	0.002	0.616	0.614
FSIZE(t -1)	0.054***	-0.021***	2.052***	-0.047***	0.01***	-0.009**
	0.000	0.000	0.000	0.000	0.001	0.045
LEV(t -1)	0.018	-0.042*	-0.818***	-0.011	0.027***	0.049***
	0.166	0.055	0.004	0.478	0.001	0.000
R&D(t -1)	0.215***	-0.107*	4.953***	-0.072	0.006	-0.022
	0.000	0.078	0.000	0.172	0.870	0.642
R^2	0.109	0.015	0.351	0.060	0.012	0.006

Panel (B) Dependent Variable is the difference of *t* and *t-1*

	ΔGI	ΔSALESG	ΔCAPITE	ΔFSIZE	ΔLEV	ΔR&D
ROA(t-1)	0.001	0.001	0.007***	0.001	-0.001	-0.001
	0.518	0.293	0.007	0.435	0.774	0.492
SALESG(t -1)	0.004	-0.006	0.144***	-0.001	-0.005	-0.006
	0.254	0.357	0.002	0.849	0.375	0.281
CAPITE(t -1)	-0.009	-0.009	0.138	0.035	0.027	-0.006
	0.747	0.900	0.753	0.280	0.320	0.878
FSIZE(t -1)	0.005***	0.001	-0.047	0.001	-0.003	-0.001
	0.007	0.902	0.134	0.919	0.146	0.845
LEV(t -1)	-0.015*	0.020	-0.088	0.011	-0.008	-0.013
	0.095	0.323	0.49	0.247	0.221	0.177
R&D(t -1)	0.017	0.041	0.069	0.039	-0.013	-0.014
	0.479	0.414	0.837	0.348	0.703	0.712
R^2	0.003	0.001	0.006	0.001	0.003	0.001

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The same test was carried out again by using Tobin's Q as a measure of corporate performance. Table 4.7 shows the relationship between the governance index, control variables, and past Tobin's Q. In panel A, the results suggest that the current level of the governance index is significantly negatively related to the past capital expenditure, while it is significantly and positively related to the past firm size, leverage and R&D expenses. However, the governance index has no significant impact on corporate performance measured by Tobin's Q. In addition, the current capital expenditure is significantly positively related to past Tobin's Q, sales growth, capital expenditure, firm size and R&D expenditure. This suggests that firms that have done well in the past are likely to be larger in the current period, as indicated by previous literature (See for example, Core *et al.*, 1999, Gillan *et al.*, 2003, Black *et al.*, 2008). Interestingly, past firm size is the only variable that has a significant relationship to the governance index and all control variables together.

Panel B of Table 4.7 presents the results from OLS regression of changes in the governance index and control variables on the Tobin's Q and control variables from two years before. The results are quite different from those reported in panel A. Clearly, a lower number of significant relationships are shown in panel B than in panel A. Changes in the governance index have a significant relationship only with past firm size, while they have no relationship with all other control variables. In contrast, changes in capital expenditure are significantly related to past sales growth. Similar to Table 4.6, Table 4.7 shows that R-square has indicated a dramatic decrease from Panel A to Panel B, suggesting that the use of changes with past values leads to low explanatory power by OLS regression model.

In conclusion, the presence of significant impacts in Table 4.6 and Table 4.7 suggest that even control variables can be dynamically endogenous. Current levels of the governance index, sales growth, capital expenditure, firm size, leverage and R&D expenditure are all significantly related to past corporate performance measured either by ROA or Tobin's Q. This highlights the fact that not only the governance index can be considered endogenous,

but also control variables included as proxies for firms' characteristics are likely to be endogenous as well.

Table 4. 7 Relationship between Corporate Governance Variables, Control Variables, and Past TQ

This table reports the results of OLS regressions of current governance index *(GI)* and current control variables, on past performance and historic values of control variables. Performance is measured by Tobin's Q *(TQ)*. The control variables include sales growth *(SALEG)*, capital expenditure *(CAPITE)*, firm size *(FSIZE)*, leverage *(LEV)* and R&D expenditure *(R&D)*. Panel A reports the results of the regressions in which the dependent variables are current levels. Panel B reports the results of the regression in which the dependent variable is the change from *t-1* to t. All *p-values* (in parentheses) are based on robust standard errors. Year and industry dummies are included in all specifications. Items with ***, **, or * are significant at the 1%, 5% and 10% respectively.

Panel (A) Dependent Variable is level at time *t*						
	GI	SALESG	CAPITE	FSIZE	LEV	R&D
TQ(t-1)	-0.015	0.021	0.694***	0.007	0.028***	0.074***
	0.246	0.348	0.003	0.668	0.001	0.000
SALESG(t-1)	-0.008	0.015	0.45***	0.017**	-0.003	-0.006
	0.167	0.178	0.000	0.039	0.612	0.440
CAPITE(t-1)	-0.121***	0.346***	1.758**	0.196***	-0.008	0.066
	0.003	0.000	0.016	0.001	0.838	0.168
FSIZE(t-1)	0.053***	-0.019***	2.054***	-0.045***	0.01***	-0.008*
	0.000	0.000	0.000	0.000	0.000	0.061
LEV(t-1)	0.034**	-0.065**	-1.434***	-0.022	0.004	-0.02
	0.044	0.024	0.000	0.315	0.739	0.263
R&D(t-1)	0.238***	-0.155***	4.932***	-0.111**	0.015	-0.044
	0.000	0.002	0.000	0.027	0.697	0.362
R^2	0.120	0.013	0.345	0.059	0.013	0.011

Panel (B) Dependent Variable is level at time *t-1* to *t*						
	ΔGI	ΔSALESG	ΔCAPITE	ΔFSIZE	ΔLEV	ΔR&D
TQ(t-1)	0.002	-0.009	0.035	0.014	0.001	0.002
	0.889	0.608	0.772	0.170	0.983	0.838
SALESG(t-1)	0.005	-0.007	0.142***	-0.001	-0.005	-0.006
	0.250	0.305	0.002	0.936	0.375	0.293
CAPITE(t-1)	-0.006	-0.005	0.308	0.044	0.026	-0.009
	0.830	0.951	0.485	0.185	0.361	0.836
FSIZE(t-1)	0.006***	0.002	-0.03	0.001	-0.003	-0.001
	0.004	0.697	0.320	0.790	0.149	0.746
LEV(t-1)	-0.016	0.025	-0.168	-0.003	-0.008	-0.013
	0.147	0.289	0.320	0.824	0.330	0.335
R&D(t-1)	0.011	0.018	-0.348	0.031	-0.01	-0.005
	0.626	0.643	0.238	0.435	0.716	0.881
R^2	0.003	0.001	0.001	0.002	0.003	0.002

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A second test is a test of strict exogeneity, which has been suggested by Wooldridge (2002). The exogeneity of the governance index and control variables can be examined by estimating the following fixed-effects model:

$$CP_{i,t} = \alpha + \beta CG_{i,t} + \beta Control. V_{i,t} + \Omega CG_{i,t+1} + \Omega Control. V_{i,t+1} + \mu_i + \varepsilon_{it} \qquad (4.2)$$

Where $CG_{i,t}$ represents the governance index, $Control. V_{i,t}$ represents control variables.

In the light of the null hypothesis of strict exogeneity $\Omega = 0$, which means that the future values of the governance index and control variables are not associated with the current values of the governance index (Guest, 2009, Wintoki *et al.*, 2012).

Table 4.8 shows the results of the equation 4.2, with different subsets of the governance index and control variables. In each specification in which they are included, the coefficient estimates for the future values of the governance index are significantly different from zero. This suggests that the governance index is strictly exogenous and the index does adjust in response to corporate performance. However, this result is consistent with the results of the first test, where the governance index was strictly exogenous with corporate performance measured by ROA. In addition, the coefficient estimates on the future values of some control variables, namely capital expenditure and firm size, are significantly different from zero, suggesting that these variables adjust to corporate performance. Further, the F-test of the joint significance of the coefficient estimates of all the future values is also significant.

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Table 4. 8: Test of Strict Exogeneity (ROA as a proxy of corporate peformance)

This table reports results from the fixed-effects estimation of the model. All *p-values* are based on robust standard errors. Year and industry dummies are included in all specifications. *, **, *** the relationship is significant at 10%, 5% and 1% respectively.

	(1)	(2)
GI	0.95	0.709
	0.683	0.754
SALESG	1.86**	1.392*
	0.019	0.057
CAPITE	19.088***	11.652*
	0.004	0.079
FSIZE	-1.587	-9.786***
	0.409	0.005
LEV	-14.333***	-12.371***
	0.000	0.001
R&D	-61.513***	-64.849***
	0.002	0.000
GI(t+1)	5.341**	4.909**
	0.029	0.038
SALESG(t+1)		0.034
		0.972
CAPITE(t+1)		19.858***
		0.004
FSIZE(t+1)		11.678***
		0.000
LEV(t+1)		-0.816
		0.799
R&D(t+1)		4.455
		0.792

The fixed-effects model in equation 4.2 is re-run again with Tobin's Q as a proxy for corporate performance. Table 4.9 shows the results of the model with different subsets of the governance index and control variables. The results are quite different to those reported in Table 4.8. In every specification in which they are included, the coefficient estimates for the future value of the governance index is not significant. The coefficient suggests that the governance index is not strictly exogenous and does not adjust in response to corporate performance. This could be due to the different purposes of the measures of corporate performance, since ROA mainly measures the profitability and Tobin's Q focuses on the future growth of a firm (Wernerfelt and Montgomery, 1988, Lang and Stulz, 1994). Interestingly, the result of this test for Tobin's Q is in sharp contrast with the result of the first test. In addition, only the coefficient estimates on the future value of sales growth and capital expenditure are significant, whereas all other control variables are insignificant from zero, indicating that these variables adjust to corporate performance. Further, the F-test of joint significant estimates of all the future values is also significant. Overall, the results of Tables 4.8 and Table 4.9 suggest that the governance index and the control variables can be considered strictly exogenous, confirming the results from OLS regressions in Table 4.6 and Table 4.7.

Table 4. 9 Test of Strict Exogeneity (TQ corporate governance measure)

This table reports results from the fixed-effects estimation of the model. All *p-values* are based on robust standard errors. Year and industry dummies are included in all specifications. *, **, *** the relationship is significant at 10%, 5% and 1% respectively.

	(1)	(2)
GI	-0.016	-0.015
	0.492	0.494
SALESG	0.002	-0.001
	0.859	0.954
CAPITE	0.093	0.041
	0.207	0.526
FSIZE	-0.121***	-0.147***
	0.000	0.000
LEV	0.936***	0.949***
	0.000	0.000
R&D	0.812***	0.753***
	0.001	0.001
GI(t+1)	0.033	0.031
	0.135	0.159
SALESG(t+1)		-0.027***
		0.004
CAPITE(t+1)		0.19**
		0.019
FSIZE(t+1)		0.026
		0.387
LEV(t+1)		-0.019
		0.552
R&D(t+1)		0.134
		0.402

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4.3.3 The Relationship between the Governance Index and the Current Corporate Performance

This section presents the results from estimating the relationship between the governance index and current corporate performance. In order for this study to compare its results with prior studies and highlight the potential problems from ignoring the likely endogenous relationship between corporate governance and corporate performance, this study uses the following four models, as suggested by Wintoki *et al.* (2012):

1- An OLS model.
2- A fixed-effects model

$$CP_{it} = \alpha_0 + \beta_1 GI_{it} + \beta_2 Control.V_{it} + \varepsilon_{it} \qquad (4.3)$$

3- A dynamic OLS model
4- A dynamic fixed-effects model (System GMM)

$$CP_{it} = \alpha_1 + k_1 CP_{it-1} + k_2 CP_{it-2} + \beta GI_{it} + \gamma Control.V_{it} + \mu_i + \varepsilon_{it} \qquad (4.4)$$

Where

GP represents corporate performance measures, namely return on assets ROA, and Tobin's Q TQ.

GI represents the governance index.

$Control.V$ represents control variables namely, sales growth $SALEG$, capital expenditure $CAPITE$, firm size $FSIZE$, leverage LEV, and R&D expenditure $R\&D$.

Thus, the equations 4.3 can be re-written as follows after including corporate performance measures and control variables as follows

$$ROA_{it} = \alpha_0 + \beta_1 GI_{it} + \beta_2 SALESG_{it} + \beta_3 CAPITE_{it} + \beta_4 FSIZE_{it} + \beta_5 LEV_{it} +$$
$$\beta_6 R\&D_{it} + \varepsilon_{it} \qquad (4.5)$$

$$TQ_{it} = \alpha_0 + \beta_1 GI_{it} + \beta_2 SALESG_{it} + \beta_3 CAPITE_{it} + \beta_4 FSIZE_{it} + \beta_5 LEV_{it} + \beta_6 R\&D_{it} + \varepsilon_{it} \quad (4.6)$$

Likewise, the equation 4.4 can also be re-written after including corporate performance measures and control variables as follows:

$$ROA_{it} = \alpha_1 + k_1 CP_{it-1} + k_2 CP_{it-2} + \beta GI_{it} + \beta_2 SALESG_{it} + \beta_3 CAPITE_{it} + \beta_4 FSIZE_{it} + \beta_5 LEV_{it} + \beta_6 R\&D_{it} + \mu_i + \varepsilon_{it} \quad (4.7)$$

$$TQ_{it} = \alpha_1 + k_1 CP_{it-1} + k_2 CP_{it-2} + \beta GI_{it} + \beta_2 SALESG_{it} + \beta_3 CAPITE_{it} + \beta_4 FSIZE_{it} + \beta_5 LEV_{it} + \beta_6 R\&D_{it} + \mu_i + \varepsilon_{it} \quad (4.8)$$

The main assumption in the GMM regression model is that all variables except industry dummies and year dummies are endogenous. Further, the GMM regression is examined for first-order AR(1) and second-order AR(2) serial correlation in the first differenced residual, under the null hypothesis of no serial correlation. Table 4.10 presents the results of the impact of the governance index on corporate performance measured by ROA. As has been discussed in Section 4.4.1, one lag of corporate performance is included in the dynamic model. This makes historical corporate performance and historical control variables, with two lags or more, available for use as instruments. Therefore, two and three periods have been used as instruments for all the endogenous variables in the GMM estimates. The main assumption in the GMM regression is that all the regressors are endogenous except industry and year dummy variables.

Static OLS and fixed-effects estimates show a positive relationship between the governance index and corporate performance. This finding is similar, in direction and magnitude, to those obtained by a number of prior studies, including Gompers *et al.* (2003), Cui *et al.* (2008) and Padgett and Shabbir (2005). However, once the analysis moves to dynamic models, these results continue with OLS and but not with GMM. For example, the coefficient on the governance index is significantly positive (4.323 *p-value* 0.000) using a static OLS model, and it continues significant in the dynamic OLS model as well (2.864, *p-value* 0.014). Note that the R square improves from 21% in the static OLS

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model to 45% in the dynamic OLS model. Past corporate performance seems to explain a significant portion of the variation in the current governance index. This difference in R square is not only economically significant, but a test based on Vuong (1989) indicates that R squares are statistically different from each other.

In addition, the use of the system GMM mode has the ability to estimate the relationship between the governance index and corporate performance, which involves both past corporate performance and fixed-effects to account for the dynamic aspects of the relationship between the governance index and corporate performance in one hand, and time-variant unobservable heterogeneity on the other (Guest, 2009, Wintoki *et al.*, 2012). The results of system GMM in Table 4.10 show that the governance index is not significantly related to ROA (-0.698, *p-value* 0.929).

This indicates that compliance with the Combined Code on Corporate Governance has no impact on profitability. This is a fundamental contrast to the results from static OLS, fixed effect model and dynamic OLS, in which the coefficient on the governance index is significant. For example, Gompers *et al.* (2003) find significant positive relationship between their shareholder right index and corporate performance for US firms. Padgett and Shabbir (2005) report a significant positive relationship between level of compliance and corporate performance for UK listed firms. However, this could be due to the structure of the GMM model, since there is no agreed structure for the GMM model in the literature. Thus, different structures of GMM could generate different results.

Regarding the relationship between control variables and past corporate performance, the results of static OLS in Table 4.10 show that sales growth is insignificantly positively related to past ROA, while capital expenditure and firm size are significantly positively related to past ROA. Both leverage and R&D expenditure have significant negative impact on past ROA. Once the dynamic OLS model is used, the relationship between sales growth and past ROA has become significantly positive, and the relationship between the rest of control variables continues the same as before. The results of fixed-effects report that sales growth and capital expenditure are significantly positively related to past ROA, while leverage and R&D expenditure are significantly negative. However, firm size has no

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significant impact on past ROA. The use of GMM documents that only one variable has a significant relationship with the past ROA. The results show that sales growth is the only control variable that has a significant positive impact on the past ROA. This suggests that firms that have had high profitability in the past are likely to have high sales today.

Table 4. 10 The Effect of the Governance Index on Current ROA

This table represents the results of static and dynamic models using return on assets (ROA) as a measure of corporate performance. Industry and year dummies, *p-values* are reported in parentheses. All t-statistics are based on robust, firm-clustered standard errors. ***;**;* represent significance at the one percent, five percent and ten percent level, respectively. AR(1) and AR(2) are tests for first-order and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. Hansen test of over-identification is under the null that all instruments are valid. Diff-in-Hansen tests of exogeneity is under the null that instruments used for the equations in levels are exogenous.

Dependent Variable (*ROA*)	Static Model		Dynamic Model	
	OLS	Fixed Effects	OLS	GMM
GI	4.323***	4.800***	2.864**	-0.698
	0.000	0.004	0.014	0.929
SALESG	0.386	2.297***	1.846***	2.771**
	0.427	0.000	0.000	0.039
CAPITE	28.202***	20.937***	6.486*	29.562
	0.000	0.000	0.081	0.181
FSIZE	2.862***	-0.793	1.27***	-8.103
	0.000	0.365	0.000	0.610
LEV	-7.863***	-13.494***	-7.622***	-4.061
	0.000	0.000	0.000	0.757
R&D	-64.687***	-55.685***	-29.848***	-83.457
	0.000	0.000	0.000	0.343
ROA(t-1)			0.463***	-0.284
			0.000	0.264
ROA(t-2)			0.127***	-0.51**
			0.000	0.036
R-square	0.213	0.091	0.452	
AR(1) test (p-value)				0.201
AR(2) test (p-value)				0.156
Hansen test of over-identification (p-value)				0.000
Diff-in-Hansen tests of exogeneity (p-value)				0.999

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However, these results have shown a dramatic change with Tobin's Q as a measure of corporate performance. Table 4.11 shows the effect of the governance index on current Tobin's Q. Unlike ROA, static OLS and fixed-effects estimates suggest positive but not significant relationship between the governance index and corporate performance. This result is similar to that of Bhagat and Bolton (2008), who find that their governance index is not significant in determining corporate performance measured by Tobin's Q for a sample of US firms over the period from 1990 to 2004. This insignificant relationship between the governance index and Tobin's Q has also been reported by Arcot and Bruno (2007) for a sample of UK firms and Bozec *et al.* (2010) for Canadian listed firms. However, the movement to the dynamic modes has shown a change in these results. In a simple dynamic OLS model, the governance index is no longer positively related to corporate performance. For example, the coefficient on the governance index is negative and not significant (0.005, *p-value* 0.825) using a static OLS model, but is insignificantly negative in the dynamic OLS model that includes lagged performance (-0.009, *p-value* 0.451). This result is consistent with Vafeas and Theodorou (1998), who find that compliance with recommendations of corporate governance has little effect on performance.

One clear insight that emerges from the dynamic OLS model is the importance of lagged corporate performance in improving the explanatory power of the model. Note that R square increases from 47% in the static OLS model to about 77% in the dynamic OLS model. Additionally, the system GMM model increases the ability to estimate the relationship between the governance index and corporate performance while involving both past corporate performance and fixed-effects to account for the dynamic nature of the relationship and time-invariant respectively. The results show that, when the fixed-effects are included in a dynamic model and estimated via system GMM, the coefficient on the governance index is not significantly negative (-0.018, *p-value* 0.689). This conclusion is consistent with that reported in Table 4.10, indicating that more compliance with the corporate governance regulations does not increase the profitability or future growth of a firm.

However, the impact of control variables has shown a different trend with Tobin's Q as a measure of corporate performance. Static OLS estimate suggests that all control variables have a significant impact on past Tobin's Q. Specifically, sales growth and capital expenditure are negatively related to Tobin's Q, while firm size, leverage and R&D expenditure have a positive impact on Tobin's Q. However, once the dynamic OLS model is used, the results have shown a considerable change. Sales growth has become significantly positive, whereas capital expenditure has no significant impact on past Tobin's Q. Furthermore, firm size has a significant negative impact on Tobin's Q. Only leverage and R&D expenditure continued as they were before in static OLS, significantly positively related to Tobin's Q. In addition, the results of the fixed-effects model suggest that sales growth has no significant impact on past Tobin's Q; while capital expenditure, leverage and R&D expenditure are significantly positively related to past Tobin's Q, and firm size is the only variables is significantly negative. Finally, the findings of the GMM model reveal that capital expenditure and leverage are significantly positively associated with past Tobin's Q, suggesting that high corporate performance in the past leads firms to spend more on assets and increase the firm's credit rate.

Table 4. 11 The Effect of the Governance Index on Current TQ

This table represents the results of static and dynamic models using Tobin's Q (TQ) as a measure of corporate performance. Industry and year dummies, *p-values* are reported in parentheses. All t-statistics are based on robust, firm-clustered standard errors. ***;**;* represent significance at the one percent, five percent and ten percent level, respectively. AR(1) and AR(2) are tests for first-order and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. Hansen test of over-identification is under the null that all instruments are valid. Diff-in-Hansen tests of exogeneity is under the null that instruments used for the equations in levels are exogenous.

Dependent Variable (*TQ*)	Static Model		Dynamic Model	
	OLS	FE	OLS	GMM
GI	0.005	0.004	-0.009	-0.018
	0.825	0.845	0.451	0.689
SALESG	-0.039***	-0.001	0.012**	0.008
	0.000	0.865	0.025	0.436
CAPITE	-0.335***	0.113**	-0.004	0.242*
	0.000	0.017	0.926	0.081
FSIZE	0.008*	-0.12***	-0.006*	0.044
	0.079	0.000	0.053	0.439
LEV	0.872***	0.939***	0.291***	0.897***
	0.000	0.000	0.000	0.000
R&D	0.137**	0.77***	0.089***	0.636
	0.012	0.000	0.008	0.172
TQ(t-1)			0.739***	0.118***
			0.000	0.003
TQ(t-2)			0.050***	0.115*
			0.001	0.087
R-square	0.473	0.554	0.844	
AR(1) test (p-value)				0.000
AR(2) test (p-value)				0.003
Hansen test of over-identification (p-value)				0.083
Diff-in-Hansen tests of exogeneity (p-value)				0.842

4.3.4 The Strength of Instruments

A number of studies suggest that in the case of the endogenous variables having a weak correlation with the instruments, then the estimates from an instrumental variable could be biased (Bound *et al.*, 1995, Staiger and Stock, 1997, Stock and Yogo, 2005). However, Wintoki *et al.* (2012) suggest that it is possible to use a standard two-stage least squares (TSLS) to evaluate the strength or weakness of instruments. The calculation of TSLS includes two steps. First, a first-stage regression is run for the endogenous variables on the instruments, then the F-statistics are tested and the obtained F-Statistic are compared with the critical value (10), which has been suggested by Staiger and Stock (1997) and Wintoki *et al.* (2012). The second step requires that the results from the first step are used to calculate a Cragg-Donald statistic and compare the value of the Cragg-Donald statistic with the critical values for instruments developed by Stock and Yogo (2005)[3].

Based on the above discussion, the following models are run under GMM

$$CP_{it} = \alpha + \beta_1 X_{it} + \varepsilon_{it} \qquad \text{Instruments: } \Delta X_{it-2} \qquad (4.9)$$

$$\Delta CP_{it} = \alpha + \beta_1 \Delta X_{it} + \varepsilon_{it} \qquad \text{Instruments: } X_{it-3} \qquad (4.10)$$

Where X represents the governance index and control variables.

Table 4.12 and Table 4.13 report the results of the first stage regression and Cragg-Donald statistics for system GMM estimates using ROA and Tobin's Q as a proxy for corporate performance. F-statistics for all the first stage regressions are significant, which suggests that the instruments provide significant explanatory power for the endogenous variables. Further, with three exceptions in panel B only, the F-statistics are all bigger than 10, which is the critical value suggested by Staiger and Stock (1997) for assessing instrument strength. In addition, Table 4.12 and Table 4.13 report the Cragg-Donald statistics. The values of the Cragg-Donlad statistics for ROA (42.409) and Tobin's Q (134.788) both

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[3] The table of critical values for instruments is included in the appendix I of this study.

exceed all the critical values from Table 5.1 of Stock and Yogo (2005), attached to the index of this study, suggesting that any bias from using the instruments is less than 5% of the bias from an OLS regression, with a 5% level of significance.

In conclusion, the results from the tests for the strength of the instruments included in the models indicate that the results of GMM estimates are not affected by weak instruments. However, these tests are conducted by using lags from period $t-2$ and $t-3$ as instruments. According to Wintoki *et al.* (2012) there is a considerable trade-off in the selection of the period of the lags from which to select instruments. This is because the main argument for the use of the dynamic GMM methodology is that past performance has an impact on the current corporate governance and the lags have to be long enough to be exogenous but not so long as to generate weak instruments. The initial selection of instruments from periods $t-3$ and $t-4$ is based on the empirical results from Table 4.5, which indicates the number of lags needed to make the model of this study complete.

Table 4. 12 First Stage Regression and Cragg-Donald Statistics for GMM (ROA as corporate performance)

Report the F-statistics and R^2's of OLS first stage regressions of levels and first differenced variables on lagged differences and lagged levels respectively.

Panel (A) Dependent Variable X is in levels			
	F-Statistic	p-value	R-Square
GI	20.280	0.000	0.091
SALESG	16.960	0.000	0.077
CAPITE	19.550	0.000	0.088
FSIZE	28.990	0.000	0.125
LEV	16.770	0.000	0.076
R&D	41.220	0.000	0.169
Cragg-Donald Statistic 42.409			

Panel (B) Dependent Variable (ΔX) is in first-differences			
	F-Statistic	p-value	R-Square
ΔGI	20.280	0.000	0.091
$\Delta SALESG$	6.710	0.000	0.034
$\Delta CAPITE$	5.230	0.000	0.027
$\Delta FSIZE$	7.890	0.000	0.040
ΔLEV	12.350	0.000	0.061
$\Delta R\&D$	12.350	0.000	0.061
Cragg-Donald Statistic 41.731			

Table 4. 13 First Stage Regression and Cragg-Donald Statistics for GMM (TQ as corporate performance)

Report the F-statistics and R^2's of OLS first stage regressions of levels and first differenced variables on lagged differences and lagged levels respectively.

Panel (A) Dependent Variable X is in levels			
	F-Statistic	p-value	R-Square
GI	18.69	0.00	0.0844
SALESG	17.52	0.00	0.0795
CAPITE	15.79	0.00	0.0722
FSIZE	28.09	0.00	0.1216
LEV	174.63	0.00	0.4626
R&D	16.46	0.00	0.0750
Cragg-Donald Statistic 144.117			

Panel (B) Dependent Variable (ΔX) is in first-differences			
	F-Statistic	p-value	R-Square
ΔGI	18.69	0.00	0.0844
$\Delta SALESG$	2.92	0.00	0.0152
$\Delta CAPITE$	2.41	0.00	0.0125
$\Delta FSIZE$	3.38	0.00	0.0175
ΔLEV	184.59	0.00	0.4930
$\Delta R\&D$	6.96	0.00	0.0354
Cragg-Donald Statistic 134.788			

4.3.5 The Impact of the Governance Index on Corporate Performance with a Lag

The analysis, so far, has focused only on the impact of current level of the governance index on current corporate performance. However, there is a possibility that current level of the governance index has an impact on future corporate governance. In other words, past compliance with corporate governance determines corporate performance today. To examine this possible impact, this study follows Wintoki *et al.* (2012) and estimates the following model:

$$CP_{it} = \alpha_1 + k_1 CP_{it-1} + k_1 CP_{it-2} + \beta GI_{it-1} + \gamma Control.V_{it-1} + \mu_{it} + \varepsilon_{it} \quad (4.11)$$

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Where CP represents corporate performance, GI represents the governance index, $Control.V$ represents control variables.

It has been suggested that, in investigating the relationship between corporate governance and corporate performance, the use of lagged governance index on current corporate performance has two important advantages (Wintoki *et al.*, 2012). First, it allows examination of the impact of corporate governance on corporate performance using a different set of assumptions. Second, it has the ability to run an alternative GMM regression that does not depend on the instrumental variables which have been used in section 4.4.3. Wintoki *et al.* (2012) suggest that, since fixed-effects regressions do not consider the impact of corporate performance on current corporate governance, as a consequence they are biased. This biasness can be corrected if there is no simultaneity between corporate performance and the governance index variables or control variables. In other words, $E(\varepsilon_{it}|X_{it-2}, Z_{it-2}) = 0$ in the equation above. This condition means that the bias-corrected fixed-effects regression may not be suitable to examine the impact of current level of the governance index on current corporate performance, it can be suitable to examine lagged governance index on corporate performance.

Table 4.14 shows the results of estimating the impact of current corporate performance measured by ROA on the lagged governance index. The results were obtained by using OLS, the dynamic GMM panel estimator, and a bias-corrected fixed effects estimator developed by Bruno (2005). The table shows that lagged governance index is significantly positively related to return on assets under OLS regression and biased-corrected fixed effects. However, this relationship is not significant under the GMM regression. In addition, the relationship between control variables and the return on assets shows different trends under each regression. For example, sales growth has a significant negative impact on return on assets under pooled OLS, while it has a significant positive impact under system GMM. Interestingly, sales growth has no significant relationship with return on assets.

The results indicate that, considering the different estimation methodology, the results of pooled OLS and bias-corrected fixed effects report that there is significant positive relationship between lagged governance index and corporate performance measured by ROA. This result is consistent with the findings of prior studies that have employed an index to measure the level of compliance with corporate governance regulations (Gompers *et al.*, 2003, Henry, 2008, Bebchuk *et al.*, 2009). However, system GMM estimation shows no relationship between the lagged governance index and ROA, as has reported in Table 4.10.

Table 4. 14 The Impact of Lagged Governance Index on current (ROA)

All t-statistics are based on robust, firm-clustered standard errors. ***;**;* represent significance at the one percent, five percent and ten percent level, respectively. AR(1) and AR(2) are tests for first-order and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. Hansen test of over-identification is under the null that all instruments are valid. Diff-in-Hansen tests of exogeneity is under the null that instruments used for the equations in levels are exogenous.

	Pooled OLS	System GMM	Bias-Corrected Fixed Effects
GI(t-1)	3.297**	2.725	6.419***
	0.027	0.552	0.005
SALESG(t-1)	-2.115**	2.879**	0.489
	0.011	0.036	0.499
CAPITE(t-1)	20.63***	22.158*	5.62
	0.000	0.067	0.445
FSIZE(t-1)	2.003***	4.639	-11.79***
	0.000	0.107	0.000
LEV(t-1)	-3.3**	12.321*	1.166
	0.022	0.071	0.599
R&D(t-1)	-52.112***	81.398*	-6.024
	0.000	0.068	0.708
R-square	0.17		0.09
AR(1) test (p-value)		0.000	
AR(2) test (p-value)		0.010	
Hansen test of over-identification (p-value)		0.000	
Diff-in-Hansen tests of exogeneity (p-value)		0.133	

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However, the move of the proxy of corporate performance from ROA to Tobin's Q shows a significant change. Table 4.15 shows that there is no relationship between the lagged governance index and corporate performance measured by Tobin's Q, regardless of estimation methodology. The results of the bias-corrected fixed effects, with ROA as a proxy for corporate performance, suggest that consideration of the dynamic aspects of the relationship between the governance index and corporate performance, and time-invariant unobservable heterogeneity without invoking the instrument variable procedure of the system GMM methodology, the conclusion of the impact of the governance index on corporate performance remains insignificant in Table 4.10 and Table 4.14. This is consistent with Bhagat and Bolton (2008), who report no relationship between the level of compliance with corporate governance regulations and corporate performance measured by ROA and Tobin's Q.

Table 4. 15 The Impact of Lagged Governance Index on current (TQ)

All t-statistics are based on robust, firm-clustered standard errors. ***;**;* represent significance at the one percent, five percent and ten percent level, respectively. AR(1) and AR(2) are tests for first-order and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. Hansen test of over-identification is under the null that all instruments are valid. Diff-in-Hansen tests of exogeneity is under the null that instruments used for the equations in levels are exogenous.

	Pooled OLS	System GMM	Bias-Corrected Fixed Effects
GI(t-1)	-0.001	-0.006	-0.001
	0.973	0.875	0.988
SALESG(t-1)	-0.039***	-0.001	-0.009
	0.000	0.953	0.398
CAPITE(t-1)	-0.209***	0.095	0.149*
	0.001	0.344	0.080
FSIZE(t-1)	0.021***	0.025	-0.047**
	0.000	0.268	0.033
LEV(t-1)	0.72***	-0.058	0.459***
	0.000	0.162	0.000
R&D(t-1)	0.086	0.165	0.529***
	0.463	0.350	0.003
R-square	0.187		0.140
AR(1) test (*p*-value)		0.020	
AR(2) test (*p*-value)		0.000	
Hansen test of over-identification (*p*-value)		0.000	
Diff-in-Hansen tests of exogeneity (*p*-value)		0.021	

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4.3.6 The Determinants of the Governance Index in a Dynamic Framework

The analysis so far has concentrated on examining the impact of the governance index on corporate performance; and has assumed that the control variables are determinants of the governance index. In other words, the analysis of this study has so far assumed that the exogenous aspects of the control variables have a real impact on the governance index, whereas there are empirical studies that have suggested that this is not actually the case (e.g., Boone *et al.*, 2007, Linck *et al.*, 2008, Lehn *et al.*, 2009). However, these studies have not controlled for all the main sources of endogenity in any relationship between the corporate governance and corporate performance that this study has considered here, which are simultaneity, unobservable heterogeneity, and the likelihood that the current control variables may be associated with the past governance index score.

In this section, the study follows Wintoki *et al.* (2012) and examines whether firm characteristics are determinants of the governance index, using generalized method of moments (GMM) regression. The following model is used to find out this relationship:

$$GI_{it} = \alpha + \sum_s k_s GI_{it-s} + \gamma Control.V_{it} + CP_{t-1} + \mu_i + \varepsilon_{it} \qquad s = 1, \dots, p \qquad (4.12)$$

Where *GI* represents the governance index and *Control.V* is control variables, and *CP* represents corporate performance, namely ROA and Tobin's Q.

Table 4.16 reports the results and compares the results obtained from the dynamic panel GMM estimator with those obtained from OLS, using ROA and Tobin's Q as measures of corporate performance. Interestingly, the results of OLS and GMM under ROA are similar to those reported using Tobin's Q as a measure of corporate performance. The GMM results report that, after controlling for simultaneity, time-invariant unobservable heterogeneity and the possible impact of past governance index score on current control variables, firm size is the only determinant of the governance index. This result is quite different from those reported in Table 4.10 and Table 4.11. However, the results of Table 4.16 demonstrate the importance of controlling for both the dynamic relation between the

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current score of the governance index and past corporate performance and time-invariant unobservable heterogeneity in the analysis.

One fact that emerges from this analysis is that, when examining the determinants of the governance index, overall the magnitude of the impact of control variables on the governance index has shown a slight change while moving from ROA to Tobin's Q. Further, in the move from OLS estimation of a static model to estimation using the dynamic panel estimator, the number of control variables that have a significant impact on the governance index has decreased. In OLS estimation sales growth, firm size and R&D expenditure have a significant impact on the governance index, whereas only firm size is significant with the dynamic GMM panel estimator. This is a significant contrast to the results of the impact of the governance index on corporate performance reported in Table 4.10 and Table 4.11. This difference may help to understand what aspects of empirical corporate finance analysis may have the most susceptibility to biases arising from ignoring the combination of unobservable heterogeneity and the dependence of current corporate finance variables on the past, and correspondingly, where analysis conducted by dynamic panel estimation may be most important.

If the main focus is on the impact of the governance index on corporate performance, exogeneity arising from dynamic relationships will be important since there is a considerable relation between past corporate performance and current control variables. On the other hand, if the main focus is on the impact of control variables on the level of the governance index, then the relationship between current values of control variables and past corporate performance variables may be less important (Guest, 2009, Wintoki *et al.*, 2012). If the control variables are not strongly determined by the past values of the governance index, any relation from the past governance index to the current control variables will be indirect through the impact, if any, of the governance index on the corporate performance. Although there is a logical strong relationship between the past control variables (such as sales growth or firm size) and the current level of the governance index, the argument for the reverse may be weaker. Thus, to measure the impact of control

variables, which represent firms' characteristics, the OLS or dynamic GMM estimates should generate similar findings, which Table 4.16 shows.

Table 4. 16 The Determinants of the Governance Index

The GMM models include one lag of the dependent variable. Year and industry dummies are included in all specifications. All t-statistics are based on robust, firm-clustered standard errors. ***;**;* represent significance at the one percent, five percent and ten percent level, respectively.

Dependent Variable (GI)	Performance (ROA)		Performance (TQ)	
	OLS	Dynamic GMM	OLS	Dynamic GMM
SALESG	-0.036***	-0.009	-0.036***	-0.014
	0.000	0.329	0.000	0.182
CAPITE	0.026	-0.014	0.045	-0.09
	0.658	0.919	0.437	0.495
FSIZE	0.081***	0.149***	0.082***	0.128***
	0.000	0.000	0.000	0.000
LEV	0.023	0.056	0.017	0.065
	0.161	0.319	0.398	0.205
R&D	0.176***	0.081	0.142**	0.094
	0.009	0.706	0.033	0.619
Performance (t-1)	0.001**	0.000***	0.005	0.008
	0.033	0.000	0.759	0.814
R-square	0.263		0.262	
AR(1) test (p-value)		0.000		0.000
AR(2) test (p-value)		0.000		0.000
Hansen test of over-identification (p-value)		0.040		0.001
Diff-in-Hansen tests of exogeneity (p-value)		0.030		0.108

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4.4 Summary

Corporate governance studies have attempted to find out the impact of corporate governance on corporate performance by examining various mechanisms like board characteristics, director ownership, duality, and board subcommittees. Typically, the vast majority of these studies focus on compliance with certain provisions or the magnitude of a specific aspect. For example, Gompers *et al.* (2003) build an index based on the requirements of anti-takeover provisions in a firms' code and find that it has an impact on corporate performance. La Porta *et al.* (2002) assume that legal regimes can be explained by a set of measures computing investors' protection. A number of commercial agencies follow a similar approach by using a tick-box strategy to rank the quality of corporate governance systems in firms. However, this approach seems to be unable to measure all the aspects of corporate governance. Consequently, it is also unable to find the impact of corporate governance as a whole on corporate performance (See for example, Larcker *et al.*, 2004, Core *et al.*, 2006, Bebchuk *et al.*, 2009).

The empirical studies have focused on the causal impact of the governance index on corporate performance. This is traditionally conducted by using corporate performance as a function of the governance index. However, it has been argued that empirical corporate governance studies often ignore the dynamic nature of the relationship between corporate governance and corporate performance (Guest, 2009, Wintoki *et al.*, 2012). In other words, current corporate performance may affect the structure of corporate governance in the future. Therefore, investigating the relationship between corporate governance and corporate performance has to take into account the reverse relationship between corporate governance and control variables on one hand and corporate performance on the other.

This study attempts to examine the relationship between corporate governance and corporate performance, using a governance index as a measure of compliance level by listed firms. It follows the dynamic model developed by Wintoki *et al.* (2012) to examine the relationship between a governance index, which covers fifteen provisions of the Combined Code on Corporate Governance in the UK, and corporate performance. The findings document that compliance with the recommendations is partly related to past

corporate performance, and after accounting for this, the results report no relationship between the governance index and corporate performance, measured by ROA and Tobin's Q. However, using the OLS and fixed-effects models reveals that the level of compliance has a significant positive impact on profitability. This suggests that bias may clarify the findings of previous studies that do not take into account the dynamic nature of the governance/performance relationship. In addition, after taking into account any possible effects of past governance index score on current corporate performance, the results show that compliance with the combined code has no impact on corporate performance.

Chapter 5

The Impact of the Board of Directors on Corporate Performance

Introduction

Corporate governance mechanisms aim to mitigate agency problems and ensure that managers act in the best interests of shareholders (e.g., Jensen and Meckling, 1976, Fama, 1980, Netter *et al.*, 2009). The most important component of any corporate governance system is the board of directors (Lipton and Lorsch, 1992, John and Senbet, 1998, Filatotchev and Boyd, 2009). The main task of the board is to monitor the managers and ensure that a firm's obligations to shareholders and others are met. This means that the board of directors' role is to advise managers, set the strategy plans, ensure the optimal use of resources, and supervise management; and it is accountable to shareholders for its role (Demsetz and Lehn, 1985a, Brennan, 2006). However, in order for the board of directors to fulfil its responsibilities, it has to be effective and efficient when it performs its tasks (Jensen, 1993, Brennan, 2006). Prior studies have suggested that there are several characteristics that affect the board of directors' performance, such as presence of independent directors, size of the board, and experience of directors, amongst others (e.g., Yermack, 1996, Baranchuk and Dybvig, 2009).

This chapter examines the relationship between the characteristics of corporate board and corporate performance. These characteristics include several factors such as the proportion of non-executive directors, whether the role of CEO and chairman are occupied by one individual (duality), size of board of directors, director ownership, and the existence of board sub-committees. This chapter is organised as follows. Section 5.1 discusses the chapter's main hypothesis, focusing on the possible impact of the board of directors on corporate performance. Section 5.2 reports descriptive statistics of the characteristics of the corporation board, and description of the changes in the aspects of the corporation board in UK listed firms over the period of this study. Section 5.3 examines the relationship between the characteristics of the corporation board and corporate performance. The final section, 5.5 summarises the main results of the descriptive statistics and regression model.

5.1 Hypothesis Development

The board of directors is the most important part of the corporate governance system and its main role is to ensure that managers act in the best interests of shareholders (Fama and Jensen, 1983b, Gillan, 2006). In order for the board of directors to be effective and fulfil its responsibilities, it has to be independent. An independent board is expected to be dominated by non-executive directors, who are independent from the managers and the CEO (Monks and Minow, 2004). Fama and Jensen (1983b) suggest that the majority of directors on the board should be non-executive directors who are able to act independently, resolve any disagreements, and hire and fire managers. Hermalin and Weisbach (1998) indicate that the increase in the number of independent non-executive directors on a board leads to increased monitoring of the CEO. Therefore, independence of the board plays a crucial role in effectively monitoring, replacing and appointing top managers.

Hermalin and Weisbach (2003) suggest that the board structure is a result of a bargaining process between managers and non-executive directors on the board. They suggest that conflicting relationships in the board arise between board directors and the CEO, since the CEO attempts to keep his job and gets more benefits from his position. However, the structure of the board of directors includes executive directors, who have expertise regarding the daily operations of the firm; and non-executive directors, who are responsible for monitoring executive directors. Several important questions have arisen regarding the effectiveness of the board. Emphasising the importance of these questions, the Combined Code on Corporate Governance (2003) suggests a number of recommendations to reform the corporate governance systems in the UK. Among these recommendations are that the majority of board members should be independent non-executive directors; the board should not be large but sufficient to contain the required experience and expertise; the role of the chairman of the board and the CEO should be split; and board sub-committees should be established.

The vast majority of empirical corporate governance studies have concluded that corporate governance mechanisms have an impact on corporate performance but that such relationship is not simultaneous (See for example, Vafeas and Theodorou, 1998, Weir *et*

al., 2002, Dahya and McConnell, 2007, Dahya *et al.*, 2009b). This means that the relationship between corporate governance and corporate performance is a one-way relationship: corporate governance affects corporate performance but not vice versa. However, it has been argued that past corporate performance can explicitly affect current corporate governance mechanisms through two channels (Wintoki *et al.*, 2012). First, Hermalin and Weisbach (1998) argue that the board's independence is the result of a bargaining process between it and the CEO. The CEO has the bargaining power from his perceived ability relative to possible successors. Wintoki *et al.* (2012) suggest that this process of bargaining leads to two important implications: first, the board's independence will be negative related to the ability of the firm's managers; second, the board's structure will be associated with past corporate performance. The second channel whereby the past corporate performance may affect the current corporate governance is through the characteristics of the firm, since board structure is determined by characteristics of the firm (Raheja, 2005), and these characteristics are affected by past corporate performance. Therefore, the board's structure is related to past corporate performance through the impact of corporate performance on firm characteristics.

The present study extends the work of Wintoki *et al.* (2012) by adding two more characteristics of the board: shareholdings by directors on the board, and the presence of board sub-committees. Specifically, it employs the generalised method of moments to examine the relationship between the characteristics of the board of directors and corporate performance, taking into account the dynamic nature of this relationship.

5.1.1 Non-Executive Directors on the Board

Agency theory suggests that the presence of non-executive directors on the board is a crucial element in ensuring that the managers will act in the best interest of shareholders. The general expectation is that non-executive directors are able to monitor executive directors since they are independent and have the expertise to carry out their function (Fama and Jensen, 1983b). It is also suggested that the presence of non-executive directors on the board improves corporate performance because of their knowledge and experience in monitoring services (Fama, 1980, Fama and Jensen, 1983b). In addition, resource

dependency theory indicates that the presence of non-executive directors might lead to increased profitability and, as a consequence, firm value, by providing the management with suggestions on future investments and strategic plans because of their expertise; and providing the firm with network associations with other firms, investors and fund sources because of their reputational integrity in the market.

In contrast, it has been suggested that executive directors are in a better position to monitor managers than are non-executive directors, since they have more information and knowledge about the firm's daily operations (Baysinger and Hoskisson, 1990). This enables them to make the right decisions and deal with problems in an effective and timely manner. In addition, non-executive directors are usually appointed on a part-time basis, which minimizes the extent of their monitoring and limits the awareness of the necessary information for decision making (Bozec, 2005). Therefore, the presence of non-executive directors on the board could decrease the firm's profitability and negatively affect corporate performance.

However, the empirical evidence on the impact of non-executive directors on the board has shown inconsistent findings. Using ten year lags of the variables for US firms, Baysinger and Butler (1985) report that the presence of non-executive directors on the board leads to better corporate performance. In addition, providing empirical evidence, Coughlan and Schmidt (1985) and Hermalin and Weisbach (1988) argue that non-executive directors on the board have the ability to effectively monitor and work as disciplining mechanisms for managers. Weisbach (1988) documents that non-executive directors on the board play a crucial role in dismissing poor directors, and improve corporate performance. Other empirical support comes from the findings of event studies. Rosenstein and Wyatt (1997) and Shivdasani and Yermack (1999) find that the announcements of appointing non-executive directors increases a firm's value. Furthermore, in a cross-country research, Dahya *et al.* (2008) reports that there is a significant positive relationship between the presence of non-executive directors and a firm's value, especially in countries with weak legal protection for shareholders.

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In contrast, a number of studies have found a negative relationship between the presence of non-executive directors and different measures of corporate performance (For example, Agrawal and Knoeber, 1996, Yermack, 1996, Laing and Weir, 1999). Recent empirical evidence also shows that the presence of non-executive directors on a board has a negative impact on profitability and productivity (Bozec, 2005). Furthermore, using the same data set, Baysinger and Hoskisson (1990) and Hermalin and Weisbach (1991) provide empirical evidence that there is no relationship between the structure of boards of directors and corporate performance. In addition, Barnhart and Rosenstein (1998) find a weak curvilinear relationship between the percentage of non-executive directors on the board and corporate performance.

The possible explanation for the inconsistent empirical findings of the relationship between the presence of non-executive directors and corporate performance discussed above is that those findings could be affected by endogeneity (Hermalin and Weisbach, 2003). Another possible reason might be the substitution effect of other variables such as percentage of executive directors, director ownership, leverage, takeover, dominant shareholders, and the measure of corporate performance (Walsh and Seward, 1990, Agrawal and Knoeber, 1996, Bozec and Breton, 2003, Bozec et al., 2010). Finally, the mixed results may be the result of the dynamic relationship between the board of directors and corporate performance (Hermalin and Weisbach, 2003, Hillier and McColgan, 2006, Wintoki et al., 2012).

However, based on the suggestions of agency theory that the presence of non-executive directors on the board makes the board more powerful and stronger in monitoring managers; and also given the recommendations and general expectations from appointing non-executive directors onto the board, this study examines the following hypothesis:

Hypothesis 2: The percentage of NEDs on the board has a significant positive impact on corporate performance.

5.1.2 Duality

Agency theory suggests that a board of directors that is dominated by the presence of executive directors cannot be monitored (Fama and Jensen, 1983b). One clear example of the domination of executive directors on the board is when one individual is appointed as both the CEO and board chairman, which is called duality. This duality leads the CEO to become entrenched since, as chairman, the CEO has the ability to change the board's plans and facilitate access to the required information. Thus, combining the roles of CEO and chairman leads to entrenchment of the CEO or executive directors, and this limits the board's monitoring ability. This indicates that it can be expected that duality has a negative impact on corporate performance. In order to ensure that the board can act independently, it is suggested that the functions of the CEO and chairman are split. Appointing different individuals in the roles of CEO and board chairman draws a clear boundary between the monitoring function of the non-executive directors and the operating function of the executive directors (Fama and Jensen, 1983b).

In contrast, duality can play a role in improving corporate performance in a firm since it can provide the firm with a CEO and chairman who has the knowledge and experience in making better decisions in a timely way, which can positively affect corporate performance. However, empirical evidence has not provided strong evidence in support of either one of these two views about duality. Using a sample of 192 US firms, Boyd (1995) suggests that duality has a positive impact on corporate performance. In contrast, Dalton *et al.* (1998) in the US and Laing and Weir (1999) in the UK have reported that duality has no significant impact on corporate performance.

From the agency theory perspective on combining the role of the CEO and the chairman, and the recommendations of corporate governance in the UK that suggest that both roles should be split, this study investigates the following hypothesis:

Hypothesis 3: There is a negative relationship between duality and corporate performance.

5.1.3 Board Size

The size of the board of directors is related to two aspects that affect its performance, which are communication and process of decisions (Lipton and Lorsch, 1992, Jensen, 1993). Lipton and Lorsch (1992) argue that a large board of directors makes the board dysfunctional as directors in such large boards rarely review the policies of managers or compare corporate performance with other firms. They suggest that a small board of directors can function more effectively than a large one. Jensen (1993) suggests that board size should be between 7 or 8 directors, as beyond that point the board could be costly and might not fulfil its responsibilities effectively. Agency theory suggests that a large board of directors becomes a symbolic mechanism and part of the management itself (Hermalin and Weisbach, 2003). Thus, since a large board of directors cannot be effective, so it cannot carry out its monitoring role and as a consequence it might negatively affect performance.

Empirically, Yermack (1996) reports a significant negative relationship between board size and Tobin's Q as a proxy of corporate performance. This conclusion has been supported by Eisenberg *et al.* (1998) who find the same relationship for Finnish firms. However, using 1650 UK quoted companies, Faccio and Lasfer (1999) provide evidence that firms that have board size larger than the median level have shown higher corporate performance. Nevertheless, Hermalin and Weisbach (2003) indicate that board size seems to be decreasing over time, suggesting that firms and markets tend to recognise the impact of smaller board size in fulfilling its responsibilities and improving firm value.

In addition, The Combined Code sets out general principles about the size of the board of directors without specifying any exact number of directors on the board. In section A.3, it states that *"The board should include a balance of executive and non-executive directors (and in particular independent non-executive directors) such that no individual or small group of individuals can dominate the board's decision taking"*. In supporting principles for section A.3, it adds that *"The board should not be so large as to be unwieldy. The board should be of sufficient size that the balance of skills and experience is appropriate for the requirements of the business and that changes to the board's composition can be managed without undue disruption"*. These principles suggest that, despite the Code's

consideration of the effect of board size on corporate performance, it makes board size optional. A possible interpretation for not setting an exact number of directors on the board is that every firm functions differently, especially when they belong to different industrial sectors (MacNeil and Xiao, 2006).

Based on the discussion above, this study examines the following hypothesis:

Hypothesis 4: There is a positive relationship between board size and corporate performance.

5.1.4 Director Ownership

Director ownership is a mechanism that may align the interests of managers with the best interests of shareholders. Jensen and Meckling (1976) suggests that, if director ownership in equity falls, their claim on the outcomes falls and this leads to encourage them to appropriate larger amounts of the firm's resources in the form of perquisites. Sappington (1991) indicates that it is important to have motivations for managers, to align their interests with shareholders and maximise the firm's value. The general expectations from such these motivations are to encourage managers to work effectively and efficiently to increase the surplus (Jensen and Meckling, 1976).

The impact of director ownership on corporate performance can be considered from different viewpoints. Jensen and Meckling (1976) and Jensen (1993) suggest that director ownership is a mechanism that can play a role in aligning the interests of managers with those of shareholders. However, it has been suggested that managers having a considerable stake in a firm can have a negative impact on corporate performance (Jensen and Meckling, 1976, Fama and Jensen, 1983a). This view has been supported by Denis *et al.* (1997), and Stulz (1988) indicates that find an inverse relation between top management turnover and director ownership. This lack of discipline provides evidence of a deficiency in incentives for managers to maximise shareholder value at this level of ownership. This implicates that larger director ownership leads to entrenchment of managers, which makes

them able to misuse the firm's resources, and as a consequence decreases corporate performance (Harris and Raviv, 1988, Morck *et al.*, 1988, Stulz, 1988).

Empirically, corporate governance studies have shown mixed findings regarding the relationship between director ownership and corporate performance. Using a cross-section of 371 US firms, Morck *et al.* (1988) report that director ownership positively affects Tobin's Q to a stake of 5%, then negatively in a range between 5% to 25%, and then positively again beyond 25%. This result is supported by Short and Keasey (1999), who find the same trend for UK listed firms, using return on equity as a measure of corporate performance. Further, Hermalin and Weisbach (1988) examine the CEO ownership and Tobin's Q and find that Tobin's Q increases if the CEO's stake ranges between 0% to 1%, then declines if the stake between 1% to 5%, then increases again in a range between 5% to 20%, and finally declines if the CEO's stake is beyond 25%.

In addition, McConnell and Servaes (1995) find that the relationship between Tobin's Q as a measure of corporate performance and ownership by executive directors is positive for ownership range between 40% and 50%, then negative. However, unlike a number of prior studies, recent empirical evidence for UK firms shows that the impact of director ownership on performance has more than two turning points (Davies *et al.*, 2005, Florackis *et al.*, 2009). In contrast, a number of studies have reported no systematic relationship between executive ownership and corporate performance (Loderer and Martin, 1997, Himmelberg *et al.*, 1999, Demsetz and Villalonga, 2001). Using OLS and simultaneous regression models, Agrawal and Knoeber (1996) report no relationship between director ownership and Tobin's Q. In addition, if the endogeneity is ignored, the director ownership continues to have no impact on performance (Morck *et al.*, 1988); even after considering ownership as endogenous, director ownership shows no impact on performance (Demsetz and Lehn, 1985a). However, using lagged Tobin's Q as an explanatory variable,Weir *et al.* (2002) indicate a positive relationship between CEO ownership and performance.

Following previous studies, this study defines the director ownership as the percentage of shares hold by both executive and non-executive directors on the board (See for example,

Morck *et al.*, 1988, McConnell and Servaes, 1990, Short and Keasey, 1999, Holderness, 2009). Theoretically, director ownership has been suggested as a mechanism to mitigate agency problems (Stulz, 1988). Therefore, this study examines the following hypothesis:

Hypothesis 5: There is a positive relationship between director ownership and corporate performance.

5.1.5 Presence of Board Sub-Committees

Prior literature suggests that board sub-committees play a role in making the board of directors more effective and efficient (Harrison, 1987, Jiraporn *et al.*, 2009, Laux and Laux, 2009). The main monitoring task for these committees is to ensure that qualified directors are nominated, daily operations are appropriately audited, and a proper remuneration is correctly rewarded (See for example, Fama and Jensen, 1983b, Chhaochharia and Grinstein, 2009, Jiraporn *et al.*, 2009). Establishment of board sub-committees has been recommended by most corporate governance codes around the world (e.g, the Cadbury Report 1999 in the UK and the Blue Ribbon Committee 1999 in the US). Also, the presence of board sub-committees has dramatically increased over the past few years. For example, Cadbury (1992) documents that 88.8% of UK firms had a remuneration committee and 48.6 had a nominating committee. Further,Weir *et al.* (2002) report that 96% of UK listed firms had formed audit committees in 1996.

However, the empirical evidence about the impact of board sub-committees on corporate performance is mixed. On one hand, it has been suggested that board sub-committees can play a crucial role in improving corporate performance and increasing profitability (e.g, Harrison, 1987, Wild, 1994, Sun and Cahan, 2009). This is because board sub-committees usually include independent non-executive directors who have more expertise and are in a better position to protect small shareholders' interests (e.g, Klein, 1998, Vafeas, 1999b). Further, since board sub-committees are relatively smaller than the actual board, they are able to meet more frequently and make timely decisions as needed (Karamanou and Vafeas, 2005). In addition, board sub-committees are specialised in specific tasks that enhance performance. For example, audit committees enhance the financial reporting

system and internal control system, while nomination committees nominate directors who have expertise and knowledge needed to improve performance.

In contrast, a number of empirical studies have suggested that the presence of a board sub-committee can have a negative impact on corporate performance for several reasons. First, the establishment of board sub-committees is accompanied by extra costs such as expenses and remuneration for directors in these committees (Vafeas, 1999b). Second, board sub-committees may impose excessive monitoring on executive directors, which can limit their initiatives in improving the firm (Goodstein *et al.*, 1994, Conger *et al.*, 1998, Vafeas, 1999b, Vafeas, 1999a). Third, board sub-committee could end up repeating the task of the board itself and this causes extra cost for the firm as a whole. Finally, having directors with different expertise and knowledge in the board and its sub-committees could generate a conflicting relationship between both groups in the firm.

The Combined Code on Corporate Governance, version dated July 2003, has adopted the Turnbull Guidance regarding internal control, the Smith Guidance regarding audit committees, and recommendations of the Higgs Report regarding non-executive directors. However, the Combined Code is regularly updated, but no significant change has been conducted regarding board sub-committees yet. The Code requires all UK listed firms to establish nomination, remuneration and audit committees; all of which should be chaired by independent non-executive directors. The code requires UK listed firms to establish a remuneration committee of at least three independent non-executive directors; whereas for the nomination committee more than half should be independent NEDs. However, the Code requires audit committees to have at least three independent NEDs, one of them with recent and relevant financial experience. These recommendations suggest that the Combined Code on Corporate Governance assumes that the formation of board sub-committees may have a positive impact on corporate performance.

Given the recommendations of the Combined Code on Corporate Governance and the general expectations from the establishment of board sub-committees, this study examines the following hypothesis:

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Hypothesis 6: There is a positive relationship between the presence of board sub-committees and corporate performance.

5.2 Descriptive Analysis

This section presents descriptive analysis of the characteristics of the board of directors over the period from 1999 to 2009. Table 5.1 reports mean, median and standard deviation of board variables over the period of this study. It can be seen that the average of non-executive directors has increased from 51% in 1999 to 61% in 2009. However, this increase is not accompanied by an increase in the average of board size. This suggests that the board of directors seems to have more non-executive directors than executive directors, keeping the same average size over the period. In addition, duality has shown a dramatic decrease from 11% in 1999 to 3% in 2009, suggesting that UK firms tend to comply with corporate governance regulations. Furthermore, director ownership has fluctuated over the period. It was 8% in 1999, then decreased to 6% in 2002; after that it increased again to reach its highest level in 2006 (9%), and finally dropped to 5% in 2009. Finally, the presence of board sub-committees is a common aspect among UK listed firms. The only noticeable increase is in the establishment of nomination committees, which increased from 76% in 1999 to 93% in 2009.

Table 5. 1 Summary of Statistics of Board Characteristics

The table contains the sample characteristics of the board used in the study: percentage of non-executive directors on the board (NED), duality (DUAL), board size (BSIZE), director ownership (MOWNER), presence of board sub-committees, audit committees (AC), remuneration committees (RC) and nomination committees (NC).

	Mean (Median) [Standard Deviation] of Board Characteristics										
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
NED	0.51	0.51	0.53	0.53	0.55	0.56	0.57	0.58	0.60	0.60	0.61
	(0.50)	(0.50)	(0.50)	(0.50)	(0.56)	(0.57)	(0.57)	(0.60)	(0.60)	(0.60)	(0.60)
	[0.14]	[0.13]	[0.13]	[0.13]	[0.13]	[0.13]	[0.13]	[0.12]	[0.12]	[0.12]	[0.12]
DUAL	0.11	0.09	0.09	0.07	0.06	0.07	0.06	0.05	0.03	0.04	0.03
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	[0.31]	[0.29]	[0.28]	[0.26]	[0.23]	[0.25]	[0.25]	[0.22]	[0.17]	[0.19]	[0.18]
BSIZE	8.71	8.49	8.36	8.26	8.17	8.11	7.98	7.97	7.88	8.01	7.96
	(8.00)	(8.00)	(8.00)	(8.00)	(8.00)	(8.00)	(8.00)	(8.00)	(8.00)	(8.00)	(8.00)
	[2.84]	[2.69]	[2.73]	[2.61]	[2.55]	[2.60]	[2.63]	[2.59]	[2.43]	[2.64]	[2.70]
MOWNER	0.08	0.08	0.07	0.06	0.07	0.07	0.08	0.09	0.08	0.05	0.05
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)
	[0.17]	[0.17]	[0.17]	[0.15]	[0.16]	[0.17]	[0.16]	[0.18]	[0.16]	[0.13]	[0.14]
AC	0.97	0.99	0.99	0.99	0.99	0.99	0.98	0.99	0.99	1.00	1.00
	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
	[0.16]	[0.12]	[0.11]	[0.11]	[0.11]	[0.10]	[0.13]	[0.11]	[0.11]	[0.07]	[0.05]
RC	0.95	0.96	0.97	0.97	0.98	0.98	0.97	0.98	0.98	0.99	0.99
	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
	[0.22]	[0.19]	[0.18]	[0.16]	[0.13]	[0.14]	[0.16]	[0.15]	[0.15]	[0.11]	[0.10]
NC	0.76	0.73	0.76	0.79	0.84	0.89	0.88	0.88	0.89	0.91	0.93
	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
	[0.43]	[0.45]	[0.43]	[0.41]	[0.37]	[0.31]	[0.32]	[0.32]	[0.31]	[0.29]	[0.25]

Table 5.2 shows the number of firms that have experienced changes in board characteristics over the period from 1999 to 2009. Over the period, between about 30% and 45% of the sample experienced a change in the proportion of non-executive directors on the board (about 38% on average). As may be expected, changes in the duality are less common than changes in non-executive directors on the board, averaging about 0.25% a year. In addition, between 21% to 42% of the firms have had at least one change in their number of directors. Furthermore, on average more than 50% of the firms have experienced a change in their director ownership. Finally, on average about 6% of the firms have changed their board sub-committees. These changes were largely during the beginning of the period and then decreased gradually. Overall, these frequent changes suggest that there is an adequate time-series variation on the main variables to allow the effective use of panel data estimation techniques.

Table 5. 2 Summary of Statistics of Changes in Board Characteristics

The table contains the sample characteristics of the board used in the study: percentage of non-executive directors on the board (NED), duality (DUAL), board size (BSIZE), director ownership (MOWNER), presence of board sub-committees, audit committees (AC), remuneration committees (RC) and nomination committees (NC).

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
NED	45.39%	44.37%	37.35%	39.65%	39.67%	41.04%	36.48%	34.52%	30.10%	29.98%	37.86%
DUAL	2.13%	1.66%	1.54%	1.46%	2.48%	1.30%	0.25%	0.48%	2.43%	0.25%	1.40%
BSIZE	42.20%	31.13%	30.56%	30.32%	32.51%	31.95%	30.77%	25.00%	29.37%	21.38%	30.52%
MOWNER	51.42%	49.01%	32.41%	67.64%	56.20%	60.26%	57.82%	44.76%	23.30%	66.83%	50.97%
AC	17.73%	6.62%	6.79%	6.12%	6.34%	5.19%	5.71%	4.76%	0.97%	1.47%	6.17%
RC	17.73%	7.95%	7.72%	7.29%	6.34%	5.19%	5.46%	5.00%	1.21%	1.47%	6.54%
NC	10.28%	8.94%	7.72%	10.20%	10.47%	4.94%	4.71%	6.19%	1.46%	2.46%	6.74%

5.3 The Relationship between the Board of Directors and Corporate Performance

This section examines the empirical relationship between the characteristics of the corporation board and corporate performance using the dynamic model adopted from Wintoki *et al.* (2012). Section 5.3.1 presents direct empirical evidence of the dynamic relationship between the board's characteristics and past corporate performance measured by return on assets and Tobin's Q. Section 5.3.2 investigates the relationship between board characteristics and corporate performance using the dynamic panel GMM estimator and comparing the results with the results of ordinary least square (OLS) and fixed-effects models. Finally, section 5.3.3 examines the validity of the instrument set which included in the dynamic GMM estimation in section 5.3.2.

5.3.1 The Relationship between Past and Present Board Characteristics

It is argued that poor performance leads to having more independent non-executive directors on the board (Hermalin and Weisbach, 1998). This argument has been supported by Dedman (2000), who finds that firms are likely to comply with the corporate governance recommendations by adding more non-executive directors on the board following poor corporate performance. In other words, past corporate performance has an impact on the future structure of corporate governance in any firm. Based on this

relationship, and following Wintoki *et al.* (2012), the relationship between board characteristics and control variables are examined by a number of tests. A first test checks the current board characteristics and control variables, and changes in these variables on the past corporate performance, and historical values of control variables by employing ordinary least square regression OLS.

$$BOD_{i,t} = \alpha + CP_{i,t-1} + \beta BOD_{i,t-1} + \beta Control.V_{i,t-1} + \mu_i + \varepsilon_{it} \qquad (5.1)$$

$$\Delta BOD_{i,t} = \alpha + CP_{i,t-1} + \beta BOD_{i,t-1} + \beta Control.V_{i,t-1} + \mu_i + \varepsilon_{it} \qquad (5.2)$$

Where *BOD* represents the board characteristics, namely percentage of non-executive directors on the board *(NED)*, duality *(DUAL)*, board size *(BSIZE)*, director ownership *(MOWNER)*, presence of board sub-committees, audit committees *(AC)*, remuneration committees *(RC)* and nomination committees *(NC)*. *Control.V* represents control variables sales growth *(SALEG)*, capital expenditure *(CAPITE)*, firm size *(FSIZE)*, leverage *(LEV)* and R&D expenses *(R&D)*.

Panel A of Table 5.3 shows the results from OLS regression of the levels of board characteristics and control variables on past corporate performance from one year back. The results report that board independence is negatively related to past performance, measured by ROA. This result is consistent with a number of prior studies that find board independence has a significant negative impact on corporate performance (e.g, Agrawal and Knoeber, 1996, Yermack, 1996, Bhagat and Black, 2002). In addition, the results also show that board size and presence of audit and remuneration committees have no significant relation to past corporate performance. In contrast, combining the roles of board chairman and CEO and director ownership has a significant positive relationship to past corporate performance. These findings suggest that directors from firms that have performed well in the past are likely to have higher ownership, as has been reported by Dahya *et al.* (2009b). Further, the establishment of audit committees has no significant impact on corporate performance, while the presence of remuneration and nomination committee has a significant positive impact on past ROA.

Panel B of Table 5.3 shows the results from OLS regressions of changes in board characteristics and control variables on the levels of corporate performance from one year before. The results are quite different from those obtained in Panel A using the levels as dependent variables. Changes in board size are the only board characteristic that is significantly positively related to past corporate performance. This suggests that any increase in return on assets during the past is highly likely to lead to an increase in board size in the future. Panel B of Table 5.3 also reports that there is a significant relationship between changes in control variables and past values of control variables; for example, the significant positive relationship between the changes in capital expenditure and changes in firm size on one hand, and past ROA on the other. This suggests that there is a possibility that control variables are dynamically endogenous.

In addition, the first test is also conducted by using Tobin's Q as a proxy of corporate performance. Panel B of Table 5.4 reports the results of OLS regressions of the levels of board characteristics and control variables on Tobin's Q from one year back. The results differ from those shown in Table 5.3, where ROA was used as a measure of corporate performance. The results show that among board characteristics only board size and the presence of board sub-committees are significantly related to past Tobin's Q, while board independence, duality and director ownership has no significant impact on past Tobin's Q. This suggests that firms that have had high firm value during past are likely to have a large board of directors and be motivated to form board sub-committees in the future, as has been indicated by Fama and Jensen (1983b) and Black and Kim (2011), among others.

Panel B of Table 5.4 reports the findings of OLS regressions of changes in board characteristics and control variables on the levels of Tobin's Q using one lag. The results show that the number of variables that significantly related to past corporate performance is less than those reported in Panel A, but similar to those reported in Panel B of Table 5.3. Clearly, changes in board characteristics are no longer significantly related to past Tobin's Q. This result is inconsistent with the findings of Wintoki et al. (2012), who report a significant positive relationship between board size and corporate performance, and negative relationship between board independence and corporate performance. However,

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changes in control variables, namely sales growth, capital expenditure and R&D expenses, show a significant negative response to the past Tobin's Q, while changes in firm size are positive. This suggests that there is still the possibility for control variables to be dynamically endogenous even after using different measure of corporate performance.

Table 5. 3 Relationship between Board Characteristics, control Variables, and Past ROA

This table reports the results of OLS regressions of current percentage of non-executive directors on the board *(NED)*, duality *(DUAL)*, board size *(BSIZE)*, director ownership *(MOWNER)*, presence of board sub-committees *(AC, RC, NC)* and current control variables, on past performance and historic values of control variables. Performance is measured by return on assets *(ROA)*. The control variables include sales growth *(SALEG)*, capital expenditure *(CAPITE)*, firm size *(FSIZE)*, leverage *(LEV)* and R&D expenditure *(R&D)*. Panel A reports the results of the regressions in which the dependent variables are current levels. Panel B reports the results of the regression in which the dependent variable is the change from *t-1* to t. All *p-values* (in parentheses) are based on robust standard errors. Year and industry dummies are included in all specifications. Items with ***, **, or * are significant at the 1%, 5% and 10% respectively.

Panel (A) Dependent Variable is level at time *t*											
	NED	DUAL	BSIZE	MOWNER	AC	RC	NC	SALESG	CAPITE	FSIZE	LEV	R&D
ROA(-1)	-0.001*	0.001**	0.002	0.001***	-0.001	0.001**	0.003***	-0.001	0.001*	0.003***	0.001	-0.001**
	0.053	0.035	0.777	0.009	0.390	0.048	0.000	0.965	0.063	0.000	0.905	0.042
SALESG(-1)	-0.008	0.014	0.418***	0.017**	-0.005	-0.009	-0.053***	0.178***	0.007***	0.038***	0.002	0.005**
	0.196	0.199	0.000	0.040	0.462	0.220	0.004	0.000	0.001	0.000	0.739	0.032
CAPITE(-1)	-0.106***	0.319***	1.423*	0.179***	-0.017	0.023	-0.422***	0.245	0.734***	0.084*	0.15***	-0.012**
	0.009	0.001	0.055	0.002	0.616	0.614	0.001	0.146	0.000	0.071	0.000	0.046
FSIZE(-1)	0.054***	-0.021***	2.052***	-0.047***	0.01***	-0.009**	0.139***	-0.048***	0.001	0.981***	0.011***	-0.001
	0.000	0.000	0.000	0.000	0.001	0.045	0.000	0.000	0.748	0.000	0.000	0.538
LEV(-1)	0.018	-0.042*	-0.818***	-0.011	0.027***	0.049***	-0.02	-0.046	-0.004	-0.013	0.839***	-0.005
	0.166	0.055	0.004	0.478	0.001	0.000	0.569	0.242	0.229	0.389	0.000	0.134
R&D(-1)	0.215***	-0.107*	4.953***	-0.072	0.006	-0.022	0.006	0.338	-0.035***	0.14**	-0.038	0.892***
	0.000	0.078	0.000	0.172	0.870	0.642	0.970	0.125	0.000	0.025	0.303	0.000
R square	0.109	0.015	0.351	0.060	0.012	0.006	0.139	0.067	0.605	0.975	0.764	0.862

Panel (B) Dependent Variable is level at time *t-1* to *t*											
	△NED	△DUAL	△BSIZE	△MOWNER	△AC	△RC	△NC	△SALESG	△CAPITE	△FSIZE	△LEV	△R&D
ROA(-1)	0.001	0.001	0.007***	0.001	-0.001	-0.001	-0.001	-0.001	0.001*	0.003***	0.001	-0.001**
	0.518	0.293	0.007	0.435	0.774	0.492	0.590	0.965	0.063	0.000	0.905	0.042
SALESG(-1)	0.004	-0.006	0.144***	-0.001	-0.005	-0.006	0.020*	-0.823***	0.007***	0.038***	0.002	0.005**
	0.254	0.357	0.002	0.849	0.375	0.281	0.078	0.000	0.001	0.000	0.739	0.032
CAPITE(-1)	-0.009	-0.009	0.138	0.035	0.027	-0.006	0.055	0.245	-0.267***	0.084*	0.15***	-0.012**
	0.747	0.900	0.753	0.280	0.32	0.878	0.405	0.146	0.000	0.071	0.000	0.046
FSIZE(-1)	0.005***	0.001	-0.047	0.001	-0.003	-0.001	-0.01***	-0.048***	0.001	-0.02***	0.011***	-0.001
	0.007	0.902	0.134	0.919	0.146	0.845	0.005	0.000	0.748	0.000	0.000	0.538
LEV(-1)	-0.015*	0.020	-0.088	0.011	-0.008	-0.013	-0.018	-0.046	-0.004	-0.013	-0.162***	-0.005
	0.095	0.323	0.49	0.247	0.221	0.177	0.229	0.242	0.229	0.389	0.000	0.134
R&D(-1)	0.017	0.041	0.069	0.039	-0.013	-0.014	-0.029	0.338	-0.035***	0.14**	-0.038	-0.109***
	0.479	0.414	0.837	0.348	0.703	0.712	0.639	0.125	0.000	0.025	0.303	0.000
R square	0.0034	0.0012	0.006	0.0014	0.0027	0.0011	0.0059	0.4574	0.1658	0.0671	0.0921	0.0679

Table 5. 4 Relationship between Board Characteristics, control Variables, and Past TQ

This table reports the results of OLS regressions of current percentage of non-executive directors on the board *(NED)*, duality *(DUAL)*, board size *(BSIZE)*, director ownership *(MOWNER)*, presence of board sub-committees *(AC, RC, NC)* and current control variables, on past performance and historic values of control variables. Performance is measured by return on assets *(TQ)*. The control variables include sales growth *(SALEG)*, capital expenditure *(CAPITE)*, firm size *(FSIZE)*, leverage *(LEV)* and R&D expenditure *(R&D)*. Panel A reports the results of the regressions in which the dependent variables are current levels. Panel B reports the results of the regression in which the dependent variable is the change from *t-1* to t. All *p-values* (in parentheses) are based on robust standard errors. Year and industry dummies are included in all specifications. Items with ***, **, or * are significant at the 1%, 5% and 10% respectively.

Panel (A) Dependent Variable is level at time *t*											
	NED	DUAL	BSIZE	MOWNER	AC	RC	NC	SALESG	CAPITE	FSIZE	LEV	RD
TQ(-1)	-0.015	0.021	0.694***	0.007	0.028***	0.074***	0.101***	-0.192***	-0.007**	0.041***	-0.015	-0.012***
	0.246	0.348	0.003	0.668	0.001	0.000	0.003	0.000	0.020	0.010	0.180	0.000
SALESG(-1)	-0.008	0.015	0.45***	0.017**	-0.003	-0.006	-0.049***	0.169***	0.006***	0.039***	0.001	0.005*
	0.167	0.178	0.000	0.039	0.612	0.440	0.008	0.000	0.003	0.000	0.858	0.056
CAPITE(-1)	-0.121***	0.346***	1.758**	0.196***	-0.008	0.066	-0.319**	0.159	0.733***	0.161***	0.144***	-0.021***
	0.003	0.000	0.016	0.001	0.838	0.168	0.015	0.336	0.000	0.001	0.000	0.000
FSIZE(-1)	0.053***	-0.019***	2.054***	-0.045***	0.01***	-0.008*	0.145***	-0.048***	0.001	0.987***	0.011***	-0.001
	0.000	0.000	0.000	0.000	0.000	0.061	0.000	0.000	0.472	0.000	0.000	0.188
LEV(-1)	0.034**	-0.065**	-1.434***	-0.022	0.004	-0.02	-0.126***	0.123***	0.002	-0.067***	0.851***	0.008**
	0.044	0.024	0.000	0.315	0.739	0.263	0.006	0.009	0.762	0.000	0.000	0.045
R&D(-1)	0.238***	-0.155***	4.932***	-0.111**	0.015	-0.044	-0.146	0.327	-0.043***	-0.017	-0.04	0.902***
	0.000	0.002	0.000	0.027	0.697	0.362	0.268	0.163	0.000	0.773	0.236	0.000
R square	0.120	0.013	0.345	0.059	0.013	0.011	0.129	0.049	0.472	0.947	0.625	0.821

Panel (B) Dependent Variable is level at time *t-1* to *t*											
	△NED	△DUAL	△BSIZE	△MOWNER	△AC	△RC	△NC	△SALESG	△CAPITE	△FSIZE	△LEV	△RD
TQ(-1)	0.002	-0.009	0.035	0.014	0.001	0.002	-0.018	-0.192***	-0.007**	0.041***	-0.015	-0.012***
	0.889	0.608	0.772	0.170	0.983	0.838	0.279	0.000	0.020	0.010	0.180	0.000
SALESG(-1)	0.005	-0.007	0.142***	-0.001	-0.005	-0.006	0.019*	-0.832***	0.006***	0.039***	0.001	0.005*
	0.250	0.305	0.002	0.936	0.375	0.293	0.091	0.000	0.003	0.000	0.858	0.056
CAPITE(-1)	-0.006	-0.005	0.308	0.044	0.026	-0.009	0.044	0.159	-0.268***	0.161***	0.144***	-0.021***
	0.830	0.951	0.485	0.185	0.361	0.836	0.512	0.336	0.000	0.001	0.000	0.000
FSIZE(-1)	0.006***	0.002	-0.03	0.001	-0.003	-0.001	-0.011***	-0.048***	0.001	-0.014***	0.011***	-0.001
	0.004	0.697	0.320	0.790	0.149	0.746	0.004	0.000	0.472	0.000	0.000	0.188
LEV(-1)	-0.016	0.025	-0.168	-0.003	-0.008	-0.013	-0.001	0.123***	0.002	-0.067***	-0.15***	0.008**
	0.147	0.289	0.320	0.824	0.330	0.335	0.962	0.009	0.762	0.000	0.000	0.045
R&D(-1)	0.011	0.018	-0.348	0.031	-0.01	-0.005	-0.02	0.327	-0.043***	-0.017	-0.04	-0.099***
	0.626	0.643	0.238	0.435	0.716	0.881	0.718	0.163	0.000	0.773	0.236	0.000
R square	0.003	0.001	0.001	0.002	0.003	0.002	0.007	0.014	0.040	0.016	0.037	0.007

The second test to examine the exogeneity of corporate governance variables and control variables is performed as suggested by Wooldridge (2002) and Wintoki *et al.* (2012). This test can be conducted by estimating the following fixed-effects model:

$$CP_{i,t} = \alpha + \beta BOD_{i,t} + \beta Control. V_{i,t} + \Omega BOD_{i,t+1} + \Omega Control. V_{i,t+1} + \mu_i + \varepsilon_{it} \quad (5.3)$$

Where *CP* represents corporate performance measured by ROA and TQ. *BOD* represents characteristics of board of directors, which are percentage of non-executive directors on the board, duality, board size, and presence of board sub-committees. *Control. V* represents control variables, which are sales growth, capital expenditure, firm size, leverage, R&D, and year and industry dummy variables.

In the light of the null hypothesis of strict exogeneity $\Omega = 0$, which means that the future values of corporate governance and control variables are not associated with the current values of corporate performance. Table 5.5 shows the results of the equation (5.3) with different subsets of the board characteristics and control variables using ROA as a measure of corporate performance. In each specification in which these variables are included, the coefficient estimates for the future values of board characteristics are insignificantly different from zero, except for director ownership *(MOWNER$_{t+1}$)* and presence of remuneration committees *(RC$_{t+1}$)*. This suggests that board characteristics cannot be considered exogenous, which is consistent with the first test, reported in Table 5.3 and Table 5.4. Additionally, the coefficient estimates on the future values of some control variables *(CAPITE$_{t+1}$, FSIZE$_{t+1}$)* are also significantly different from zero, indicating that these control variables also react to corporate performance. Further, a test of the joint coefficient estimates, reported in column 9 of Table 5.5, shows that only capital expenditure and firm size are significant.

However, the use of Tobin's Q as a measure of corporate performance generates different results. Table 5.6 presents the results of the equation (5.3) with a different structure, as suggested by Wintoki *et al.* (2012). In each column of Table 5.6 the coefficient estimates for the future values of board characteristics *(NED$_{t+1}$, DUAL$_{t+1}$, BSIZE$_{t+1}$, MOWNER$_{t+1}$, AC$_{t+1}$, RC$_{t+1}$, NC$_{t+1}$,)* are insignificantly different from zero. This insignificant relationship

indicates that board characteristics cannot be considered as strictly exogenous and do not respond to Tobin's Q, which contradicts the results of the first test of exogeneity. In addition, the coefficient estimates on the future values of only one control variable $(CAPITE_{t+1})$ are significantly different from zero, indicating that this variable adjusts to corporate performance measured by Tobin's Q. However, this result is still inconsistent with the findings of Table 5.4, which shows a significant relationship between past values of Tobin's Q and current values of control variables.

In conclusion, the results reported in this section suggest that board characteristics and control variables cannot be considered strictly exogenous. However, the extent of the response to the corporate performance depends on the measure of corporate performance. For example, in the first test the response of board characteristics and control variables is more sensitive to Tobin's Q, while in the second test they are more sensitive to ROA. However, both measures of corporate performance indicate that board characteristics and control variables can still be regarded as endogenous variables.

Table 5. 5 Test of Strict Exogeneity (ROA corporate governance measure)

This table reports results from the fixed-effects estimation of the model. All p-values are based on robust standard errors. Year and industry dummies are included in all specifications. *, **, *** the relationship is significant at 10%, 5% and 1% respectively.

Dependent Variable (ROA)	1	2	3	4	5	6	7	8	9
NED(t)	-3.191	-3.252	-3.062	-3.301	-3.345	-3.287	-3.096	-2.84	-2.672
	0.271	0.248	0.283	0.240	0.235	0.244	0.269	0.321	0.349
DUAL(t)	-0.343	-0.925	-0.389	-0.456	-0.377	-0.276	-0.373	-1.105	-0.662
	0.813	0.507	0.788	0.752	0.794	0.850	0.796	0.430	0.637
BSIZE(t)	-0.209	-0.206	-0.339**	-0.218	-0.206	-0.215	-0.206	-0.326*	-0.293*
	0.204	0.210	0.042	0.185	0.212	0.192	0.212	0.051	0.073
MOWNER(t)	8.81***	8.907***	8.637***	5.748*	9.139***	8.987***	8.94***	6.182*	5.314*
	0.003	0.003	0.004	0.071	0.002	0.003	0.003	0.056	0.092
AC(t)	0.206	0.2	0.108	0.004	-3.029	0.102	0.577	-2.349	-2.115
	0.969	0.970	0.984	0.999	0.496	0.985	0.914	0.596	0.635
RC(t)	3.508	3.537	3.599	3.356	3.595	1.823	3.515	2.882	2.54
	0.123	0.116	0.111	0.141	0.118	0.403	0.124	0.184	0.266
NC(t)	2.003*	2.043*	2.002*	1.847*	2.023*	2.036*	0.617	1.07	1.171
	0.061	0.057	0.062	0.084	0.057	0.056	0.619	0.389	0.360
SALESG(t)	1.709**	1.707**	1.659**	1.652**	1.774**	1.726**	1.696**	1.657**	1.29*
	0.033	0.034	0.037	0.041	0.026	0.031	0.035	0.039	0.086
CAPITE(t)	18.989***	19.087***	18.849***	18.737***	19.175***	18.634***	18.596***	18.485***	11.678*
	0.004	0.004	0.004	0.005	0.004	0.005	0.005	0.005	0.080
FSIZE(t)	-1.626	-1.679	-1.836	-1.608	-1.816	-1.65	-1.797	-2.084	-9.195***
	0.418	0.403	0.360	0.424	0.364	0.410	0.376	0.299	0.009
LEV(t)	-14.739***	-14.743***	-14.499***	-14.998***	-14.675***	-14.727***	-14.746***	-14.753***	-12.996***
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
R&D(t)	-61.541***	-61.627***	-61.495***	-61.701***	-61.141***	-61.387***	-61.202***	-61.136***	-64.125***
	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.000
NED(t+1)	-0.284							-0.106*	0.06
	0.918							0.097	0.983
DUAL(t+1)		1.463						1.478	1.187
		0.183						0.762	0.276
BSIZE(t+1)			0.069					0.262	0.136
			0.069					0.124	0.415
MOWNER(t+1)				9.136***				8.766***	7.25**
				0.001				0.009	0.011
AC(t+1)					10.625			8.075	7.063
					0.146			0.256	0.324
RC(t+1)						5.182*		2.037	2.185
						0.090		0.970	0.397
NC(t+1)							2.239	1.363	1.104
							0.161	0.181	0.469
SALESG(t+1)									-0.113
									0.905
CAPITE(t+1)									18.365***
									0.008
FSIZE(t+1)									10.364***
									0.001
LEV(t+1)									-0.775
									0.809
R&D(t+1)									3.63
									0.822

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Table 5. 6 Test of Strict Exogeneity (TQ corporate governance measure)

This table reports results from the fixed-effects estimation of the model. All *p-values* are based on robust standard errors. Year and industry dummies are included in all specifications. *, **, *** the relationship is significant at 10%, 5% and 1% respectively.

Dependent Variable (TQ)	1	2	3	4	5	6	7	8	9
NED(t)	-0.04*	-0.053***	-0.07**	-0.071**	-0.071**	-0.07**	-0.07**	-0.055*	-0.059
	0.085	0.010	0.030	0.029	0.029	0.029	0.031	0.061	-0.115
DUAL(t)	0.001	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.004
	0.914	0.771	0.832	0.818	0.839	0.806	0.832	0.743	-0.014
BSIZE(t)	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
	0.377	0.385	0.213	0.344	0.345	0.335	0.343	0.211	-0.005
MOWNER(t)	-0.026	-0.026	-0.004	0.001	-0.002	-0.003	-0.003	0.001	-0.002
	0.150	0.162	0.914	0.991	0.967	0.942	0.931	0.983	-0.047
AC(t)	0.026	0.026	0.036	0.036	0.02	0.036	0.037	0.022	0.027
	0.367	0.372	0.188	0.183	0.544	0.182	0.173	0.505	-0.039
RC(t)	0.005	0.004	-0.011	-0.011	-0.011	-0.018	-0.011	-0.013	-0.013
	0.823	0.831	0.570	0.569	0.580	0.320	0.565	0.461	-0.045
NC(t)	0.014*	0.014*	0.013	0.013	0.013	0.013	0.01	0.012	0.012
	0.070	0.070	0.266	0.258	0.261	0.259	0.400	0.264	-0.008
SALESG(t)	-0.007	-0.007	0.001	0.002	0.002	0.002	0.001	0.002	-0.001
	0.112	0.113	0.909	0.894	0.866	0.892	0.903	0.868	-0.016
CAPITE(t)	0.035	0.035	0.093	0.093	0.094	0.092	0.092	0.093	0.042
	0.485	0.484	0.211	0.207	0.202	0.211	0.212	0.209	-0.085
FSIZE(t)	-0.057***	-0.058***	-0.121***	-0.121***	-0.122***	-0.121***	-0.121***	-0.121***	-0.146
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.213
LEV(t)	0.934***	0.935***	0.935***	0.935***	0.935***	0.935***	0.935***	0.935***	0.950
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.884
R&D(t)	0.72***	0.719***	0.805***	0.805***	0.807***	0.805***	0.805***	0.808***	0.750
	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.304
NED(t+1)	-0.026							-0.034	-0.035
	0.268							0.238	-0.089
DUAL(t+1)		-0.005						-0.003	-0.002
		0.693						0.832	-0.021
BSIZE(t+1)			0.705					0.769	-0.002
			0.705					0.769	-0.002
MOWNER(t+1)				-0.01				-0.01	-0.005
				0.770				0.770	-0.068
AC(t+1)					0.052			0.045	0.049
					0.268			0.362	-0.048
RC(t+1)						0.022		0.008	0.009
						0.289		0.667	-0.027
NC(t+1)							0.006	0.002	-0.001
							0.662	0.917	-0.024
SALESG(t+1)									-0.027
									-0.045
CAPITE(t+1)									0.19**
									0.034
FSIZE(t+1)									0.024
									-0.036
LEV(t+1)									-0.022
									-0.083
R&D(t+1)									0.134
									-0.185

5.3.2 The Impact of Board of Directors on Current Corporate Performance

This section attempts to find out the relationship between characteristics of the board of directors and corporate performance by employing different regression models. The use of different models aims to compare the results of this study with the results of prior corporate governance studies. This enables the researcher to highlight possible problems in prior studies that have ignored the endogeneity of the variables as highlighted above. Following Wintoki *et al.* (2012), the following models will be used:

1- An OLS model
2- A fixed-effects model

$$CP_{it} = \alpha_0 + \beta_1 BOD_{it} + \beta_2 Control.V_{it} + \varepsilon_{it} \qquad (5.4)$$

3- A dynamic OLS model
4- A dynamic fixed-effects model (System GMM)

$$CP_{it} = \alpha_1 + k_1 BOD_{it-1} + k_2 CP_{it-1} + \beta BOD_{it} + \gamma Control.V_{it} + \mu_i + \varepsilon_{it} \qquad (5.5)$$

Where *CP* represents corporate performance measured by ROA and TQ. *BOD* represents characteristics of board of directors, which are percentage of non-executive directors on the board *(NED)*, duality *(DUAL)*, board size *(BSIZE)*, and presence of board sub-committees, audit committees *(AC)*, remuneration committees *(RC)*, and nomination committees *(NC)*. *Control.V* represents control variables, which are sales growth *(SALEG)*, capital expenditure *(CAPITE)*, firm size *(FSIZE)*, leverage *(LEV)*, and R&D expenses *(R&D)*.

As has been mentioned in Table 4.5 of the previous chapter, one lag of corporate performance is included in the dynamic models since one lag is significant with both proxies of corporate performance. In addition, one-year lag for board characteristics and other control variables are included as instruments. Therefore, two and three lags, respectively, have been used as instruments for all endogenous variables in the GMM estimates, as suggested by Wintoki *et al.* (2012). The main assumption in the GMM regression model is that all variables except industry and year dummies are endogenous.

Furthermore, the GMM regression is examined for first-order *AR(1)* and second-order *AR(2)* serial correlation in the first differenced residual, under the null hypothesis of no serial correlation. In addition, as Wintoki *et al.* (2012) suggests, board characteristics and control variables lagged two and three periods are used as instruments in GMM regression.

Table 5.7 reports the results of the equations 5.4 and 5.5 using the ROA as a measure of corporate performance. Static OLS and fixed-effects estimates indicate a negative relationship between proportion of non-executive directors on the board and corporate performance. This result is similar to those reported by a number of prior studies (See for example, Yermack, 1996, Bhagat and Black, 1999, Bhagat and Black, 2002). However, examining the same issue by a dynamic model reveals a different result. In a simple dynamic OLS model, proportion of non-executive directors on the board is no longer significantly related to corporate performance. For example, the coefficient on percentage of non-executive directors is significantly negative (-4.059 *p-value* = 0.011) using a static OLS model, while it is insignificant in the dynamic OLS model that includes lagged ROA (0.216, *p-value* = 0.885).

Although the use of the sample dynamic OLS model is considered an enhancement of the static OLS model, it is simply a transitional stage. Further, it is clear that the use of the dynamic OLS model indicates the crucial impact of lagged corporate performance in exploring the relationship between board characteristics and corporate performance. In addition, the R-square improves from 22% in the static OLS model to 45% in the dynamic OLS model. This suggests that past ROA seems to have a higher ability to explain a significant percentage of variation in current ROA. This difference in the values of R-square is economically and statistically different from each other (Vuong, 1989). Furthermore, the decrease in the magnitude of the estimated coefficients on the board's characteristics from the static OLS model to the dynamic OLS model indicates that the current board characteristics are related to the past corporate performance. Also, this decrease could be considered as another possible suggestion of endogeneity that results from the relationship between board characteristics and corporate performance. However,

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there could be a possibility that some unobservable heterogeneity is not captured by past corporate performance (Wintoki *et al.*, 2012).

It has been suggested that use of the system GMM model leads to estimation of the relationship between board characteristics and corporate performance taking into account past corporate performance and fixed-effects to capture the dynamic nature of board characteristic and time-invariant unobservable heterogeneity, respectively (Wintoki *et al.*, 2012). The move from fixed-effects to the system GMM model in Table 5.7 shows that director ownership is the only board characteristic that significantly determines past ROA. However, it has been indicated that the negative bias in the fixed-effects' coefficient estimate is the same bias that results in cases of ignoring the dynamic nature of the relationship of board characterises and corporate performance (Wintoki *et al.*, 2012). Therefore, if the proportion of non-executive directors on the board is positively associated to past corporate performance, the fixed-effects estimates of the relationship between non-executive directors and corporate performance will be negatively biased.

The static OLS estimate also shows that duality is insignificantly related to corporate performance. This finding is consistent with a number of prior studies that report duality has no impact on corporate performance (See for example, Chaganti *et al.*, 1985, Baliga *et al.*, 1996, Brickley *et al.*, 1997, Dahya *et al.*, 2009b). Interestingly, the move from static OLS to dynamic OLS model and from fixed-effects model to GMM model continues to show an insignificant impact of duality on corporate performance. This suggests that splitting or combining the roles of board chairman and CEO will not increase or decrease the profitability of a firm. However, this seems to conflict with the recommendations of the Combined Code on Corporate Governance, which recommend that separation of the roles of CEO and chairman improves the corporate governance system.

In addition, static OLS estimates suggest an insignificant relationship between board size and corporate performance. This relationship becomes significantly negative with the move to static fixed-effects estimates. This result is similar in its direction and magnitude to those reported by a number of prior studies including Yermack (1996),Guest (2009) Bhagat and Black (2002), and Guest (2009). However, when shifting from static models to

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dynamic models, these findings change. In a simply dynamic OLS model, board size is insignifcantly negatively related to corporate peroformance, which is similar to the static OLS model. One noticeable improvement is the R-sequare which changes from 22% in the static OLS model to 45% in the dynamic OLS model. This suggests that past corporate performance seems to have a higher ability to explain the variation in current corporate performance.

Furthermore, the slump in the magnitude of the estimated coefficients on the board size variable during the shift from the static OLS model to the dynamic OLS model indicates that current board size is associated with past corporate peformance. However, the system GMM model has the ability to estimate the relationship between corproate governance and corporate performance and time-invariant unobservable heterogeneity, respectively. The findings report that the coefficient of system GMM model on board size is insignifcant (0.094, p-$value$ = 0.880). This result is in total contrast to the results from the fixed-effects model where the coefficient on board size is significantly negative (-0.249, p-$value$ = 0.044). However, as has been suggested by Wintoki et $al.$ (2012), if board size and past corporate performance are positively associated, then fixed-effects estimates of the relationship between board size and corporate performance will be negatively biased.

The static OLS estimate also shows a significant positive relationship between director ownership and corporate performance (3.001, p-$value$= 0.016), similar to that documented in a number of prior studies including Jensen and Meckling (1976), Demsetz and Villalonga (2001) and Core and Larcker (2002). This relationship continues significantly positive with a static fixed-effects' model (10.628, p-$value$=0.000). However, in the dynamic OLS model the relationship between director ownership and corporate performance is insignificant (0.405, p-$value$ = 0.776 and 12.023, p-$value$ = 0.205), while in GMM estimator it is significantly positive (17.711, p-$value$ = 0.072). The reason behind this positive relationship could be that the bias may generate because unobservable heterogeneity and dynamic relationship between director ownership and corporate performance are not taken into account. As suggested by a number of prior studies, the relationship between director ownership and firm performance is positive but decreasing

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over time (See for example, Holderness *et al.*, 1999, Davies *et al.*, 2005, Adams and Santos, 2006).

The final aspect of the board of directors is the presence of board sub-committees. The result of static OLS and fixed-effects estimates shows that the nomination committee is the only board sub-committee that has a significant positive relationship with corporate performance. This result is consistent with the findings of Chhaochharia and Grinstein (2007) and Brick and Chidambaran (2007), who indicate that the presence of nomination committees increases the board's monitoring ability, and as a consequence improves firms' value over time. Further, using 25 Canadian listed companies over the period from 1976 to 2005, Bozec (2005) finds that there is a statistically insignificant relationship between the presence of a nomination committee and return on ROA. However, the move to a dynamic OLS model continues to show the same result; while the system GMM model documents that the establishment of board sub-committees has no impact on corporate performance. This suggests that the presence of audit, remuneration and nomination committees does not play a role in improving the profitability of a firm. This is a sharp contrast to the expectations of the corporate governance recommendations.

Table 5.7 also shows the results of control variables, the $AR(2)$ second order serial correlation tests and the Hansen test of over-identifying restrictions. The $AR(2)$ test yields a *p*-value of 0.433 which means that the null hypothesis of no second-order serial correlation can be accepted. The results also report the *J*-statistic with a *p*-value of 0.965 and as such, the hypothesis that the instruments are valid can be accepted. In addition, Table 5.7 reports the findings of a test of the exogeneity of the instruments of this study. This test is required since the system GMM estimator, as has been suggested by Wintoki *et al.* (2012), has an extra exogeneity assumption that any correlation between the endogenous variables and unobserved (fixed) variables is constant over time. This assumption leads to the use of different levels in GMM estimates that levels include the use of lagged differences as instruments for these levels. This assumption also can be tested directly by a difference-in-Hansen test of exogeneity (Hansen and Singleton, 1982). The results in Table 5.7 show *p*-value of 0.91 for the *J*-statistic produced by the difference-in-Hansen test. This suggests

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that the hypothesis that the additional subset of instruments included in the system GMM estimates is indeed exogenous can be accepted.

Table 5.5 also presents the findings of the relationship between control variables and corporate performance. Static OLS and fixed-effects estimates suggest a positive relationship between capital expenditure (CAPITE) and ROA, while leverage (LEV) and R&D expenditure are significantly negatively related to ROA. The significant positive relationship between capital expenditure and ROA indicates that investment in assets leads to increases in the firm's value (McConnell and Muscarella, 1985). Also, the significant negative impact of leverage on corporate performance is consistent with the findings of a number of prior studies (See for example, Agrawal and Knoeber, 1996, Demsetz and Villalonga, 2001, Weir et al., 2002), while the negative relationship between R&D expenditure and ROA has been indicated by Demsetz and Lehn (1985a) and Denis and Denis (1994). Additionally, the static OLS estimate suggests that there is no relationship between sales growth and corporate performance, while this relationship is significantly positive by fixed-effects model. However, the move to dynamic models shows a different impact for control variables on corporate performance. While the only change in the dynamic OLS model is that impact of sales growth is significantly related to ROA, the system GMM model shows a significant negative relationship between R&D expenditure and ROA.

The relationship between board of directors and corporate performance is also examined by using Tobin's Q as a measure of corporate performance. Table 5.6 shows the results of the impact of board characteristics on current Tobin's Q. The results are quite similar to what has been reported in Table 5.5 using ROA as a proxy for corporate performance. The static OLS estimate indicates no relationship between percentage of non-executive directors on the board and Tobin's Q, whereas the fixed-effects model shows this relationship is significantly negative. The result of the static OLS estimate is consistent with the findings of Hermalin and Weisbach (1991), while the result of the fixed-effects model is similar to that reported by Yermack (1996) and Bhagat and Black (2002). However, this relationship continues significantly negative with the dynamic OLS model.

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but insignificant with the system GMM model. One clear change that results from the move to the dynamic OLS model is the crucial role which lagged Tobin's Q plays in examining the impact of board of directors on Tobin's Q. Note that the R-square increases from 48% in the static OLS model to 77% in the dynamic OLS model. This indicates that past values of Tobin's Q seem to explain a considerable portion of the variation in the current Tobin's Q.

In addition, the static OLS in Table 5.6 shows that duality has a significant positive impact on Tobin's Q. This result is consistent with the findings of Weir *et al.* (2002), who indicate the similar relationship for UK listed firms over the period 1994 to 1996. However, the fixed-effects model reveals that duality has no impact on corporate performance measured by Tobin's Q. The results continue to show no relationship between duality and corporate performance with dynamic OLS and the system GMM model. Further, static OLS shows that board size is significantly positively related to Tobin's Q, whereas the static fixed-effects model suggests that board size is significantly negatively related to Tobin's Q. The positive relationship between board size and Tobin's Q is consistent with a number of prior studies that used OLS as a main regression in examining the impact of board size (See for example, Bhagat and Black, 2002, Cheng, 2008), but inconsistent with Yermack (1996), who reports that both regressions OLS and fixed-effects models suggest a significant negative relationship between board size and Tobin's Q. However, the use of dynamic models shows that board size has no impact on Tobin's Q, which has been reported by Wintoki *et al.* (2012).

Furthermore, the results suggest that director ownership has no significant impact on Tobin's Q. This suggests that any increase or decrease in shares' ownership by directors on the board will not increase or decrease corporate performance. This result is in contrast with findings that director ownership plays an important role in increasing corporate performance (See for example, Dedman, 2000, Peasnell *et al.*, 2003, Aidong and Kumar, 2004). However, a number of studies have suggested that director ownership has non-linear relation with performance (See for example. Griffith, 1999, Short and Keasey. 1999. McConnell *et al.*, 2005). Finally, the results of the static OLS and fixed-effects models in

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Table 5.6 report that the establishment of audit committees and remuneration committees has no impact on Tobin's Q, while the presence of nomination committees is significantly positively related to corporate performance. This result is partly consistent with Vafeas and Theodorou (1998), who indicate that the establishment of board sub-committees is significantly positively related to Tobin's Q. However, moving from static models to dynamic models shows that there is no relationship between the presence of board sub-committees and Tobin's Q. This suggests that complying with the corporate governance regulations does not lead to an improvement in corporate performance, although it could improve the internal control systems.

However, it is worth noting that the differences in the sign of the coefficients of board characteristics and other corporate governance variables in static and dynamic models may be interpreted by the differences in their impacts, advantages and disadvantages. For instance, and as has been discussed in subsection 4.2.2.3 of Chapter Four, since ROA is a historical measure of corporate performance, it cannot represent the present variations in the business environment. On the other hand, Tobin's Q is considered a market measure that has the ability to predict improvement in future performance that may be explained by the existing changes in the business environment. Tobin's Q also backs the empirical evidence of prior studies, which indicates that directors, who mostly depend on ROA as a performance measure, and shareholders, who use Tobin's Q to evaluate performance, assess corporate performance differently (Black et al., 2006b, Haniffa and Hudaib, 2006 in the UK, Bebchuk et al., 2009). Generally, these differences seem to be a justification for including both ROA and Tobin's Q as measures of corporate performance, letting every measure mitigate the disadvantages of the other.

Table 5.6 also shows the results of specifications tests, the AR(2) second order serial correlation tests and the Hansen J test of over-identifying restrictions. The AR(2) test shows a p-value of 0.124, which indicates that the null hypothesis of no second-order serial correlation can be accepted. The results in Table 5.6 also report a J-statistic with a p-value of 0.416 and as a result the hypothesis that the instruments are valid can be accepted. Additionally, Table 5.6 presents the results of a test of the exogeneity of a subset of the

instruments of this study. As suggested by Wintoki *et al.* (2012), there are additional exogeneity assumption for system GMM estimator that the relationship between endogenous variables and the unobserved effects is constant over the period of time. This assumption can be tested by using a difference-in-Hansen test of exogeneity (Hansen and Singleton, 1982). The results in Table 5.6 present a p-value of 0.948 for the J-statistic generated by the difference-in-Hansen test. This suggests that the hypothesis that the additional subset of instruments included in the system GMM estimates is exogenous can be accepted. Overall, Table 5.6 documents that there is no relationship between board characteristics and corporate performance.

Table 5. 7 The Impact of Board characteristics on Current ROA

This table represents the results of static and dynamic models using return on assets (ROA) as a measure of corporate performance. Industry and year dummies, *p-values* are reported in parentheses. All t-statistics are based on robust, firm-clustered standard errors. ***;**;* represent significance at the one percent, five percent and ten percent level, respectively. AR(1) and AR(2) are tests for first-order and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. Hansen test of over-identification is under the null that all instruments are valid. Diff-in-Hansen tests of exogeneity is under the null that instruments used for the equations in levels are exogenous.

Dependent Variable (ROA)	Static Model		Dynamic Model	
	OLS	FE	OLS	GMM
NED	-4.059**	-5.118**	0.216	-7.638
	0.011	0.013	0.885	0.478
DUAL	1.072	-1.003	0.029	1.54
	0.187	0.291	0.971	0.670
BSIZE	-0.135	-0.249**	-0.101	0.094
	0.135	0.044	0.227	0.880
MOWNER	3.001**	10.628***	-0.488	17.711*
	0.016	0.000	0.685	0.072
AC	-3.343	0.638	-0.814	-27.06
	0.110	0.822	0.709	0.134
RC	0.110	0.822	0.709	0.134
	0.085	0.123	0.403	0.177
NC	3.142***	1.969***	1.499**	3.634
	0.000	0.009	0.012	0.310
SALESG	0.333	2.109***	1.898***	3.411**
	0.493	0.000	0.000	0.032
CAPITE	27.486***	20.888***	6.8*	25.036
	0.000	0.000	0.069	0.224
FSIZE	3.399***	-0.982	1.481***	0.163
	0.000	0.284	0.000	0.987
LEV	-7.507***	-13.963***	-7.521***	-11.877
	0.000	0.000	0.000	0.401
R&D	-61.218***	-55.884***	-28.536***	-159.446
	0.000	0.000	0.000	0.185
ROA(t-1)			0.462***	-0.122
			0.000	0.545
ROA(t-2)			0.127***	-0.298
			0.000	0.365
R-square	0.22	0.10	0.45	
AR(1) test (p-value)				0.010
AR(2) test (p-value)				0.433
Hansen test of over-identification (p-value)				0.000
Diff-in-Hansen tests of exogeneity (p-value)				0.965

Table 5. 8 The Impact of Board characteristics on Current Tobin's Q

This table represents the results of static and dynamic models using Tobin's Q (TQ) as a measure of corporate performance. Industry and year dummies, *p-values* are reported in parentheses. All t-statistics are based on robust, firm-clustered standard errors. ***;**;* represent significance at the one percent, five percent and ten percent level, respectively. AR(1) and AR(2) are tests for first-order and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. Hansen test of over-identification is under the null that all instruments are valid. Diff-in-Hansen tests of exogeneity is under the null that instruments used for the equations in levels are exogenous

Dependent Variable (Tobin's Q)	Static Model		Dynamic Model	
	OLS	FE	OLS	GMM
NED	-0.007	-0.096***	-0.022	-0.057
	0.779	0.000	0.144	0.311
DUAL	0.024*	0.006	-0.001	-0.002
	0.054	0.562	0.961	0.932
BSIZE	0.006***	-0.003**	0.002	0.003
	0.000	0.045	0.219	0.464
MOWNER	0.012	-0.009	0.002	-0.061
	0.543	0.599	0.886	0.228
AC	-0.007	0.04	-0.003	0.06
	0.838	0.132	0.899	0.624
RC	0.838	0.132	0.899	0.624
	0.000	0.712	0.121	0.927
NC	0.019**	0.016**	-0.004	-0.002
	0.044	0.032	0.577	0.947
SALESG	-0.039***	-0.002	0.011**	0.004
	0.000	0.777	0.034	0.738
CAPITE	-0.348***	0.111**	-0.008	0.218
	0.000	0.019	0.850	0.126
FSIZE	-0.004	-0.12***	-0.007*	0.005
	0.477	0.000	0.060	0.892
LEV	0.873***	0.938***	0.291***	0.857***
	0.000	0.000	0.000	0.000
R&D	0.119**	0.759***	0.084**	0.516
	0.031	0.000	0.014	0.240
TQ(t-1)			0.737***	0.129***
			0.000	0.005
TQ(t-2)			0.05***	0.075
			0.001	0.273
R-square	0.479	0.5586	0.766	
AR(1) test (p-value)				0.000
AR(2) test (p-value)				0.124
Hansen test of over-identification (p-value)				0.416
Diff-in-Hansen tests of exogeneity (p-value)				0.948

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5.3.3 The Strength of Instruments

A number of studies suggest that, in cases where the endogenous variables have a weak correlation with the instruments, then the estimates from an instrumental variable could be biased (Bound *et al.*, 1995, Staiger and Stock, 1997, Stock and Yogo, 2005). However, Wintoki *et al.* (2012) suggest that a standard two-stage least squares (TSLS) be used to evaluate the strength or weakness of instruments. This procedure includes two steps. First, a first-stage regression is run for the endogenous variables on the instruments then the F-statistics are tested and the obtained F-Statistic is compared with the critical value (10), which has been suggested by Staiger and Stock (1997) and Wintoki *et al.* (2012). Second, from the first step, calculate a Cragg-Donald statistic and compare its value with the critical values for instruments developed by Stock and Yogo (2005) (attached to the appendix I). Also, so far this study employs one lag; this allows us to use two and three lags as instruments in the analysis.

Based on the above discussion, the following models are run under GMM:

$$CP_{it} = \alpha + \beta_1 X_{it} + \varepsilon_{it} \qquad \text{Instruments: } \Delta X_{it-2} \qquad (5.6)$$

$$\Delta CP_{it} = \alpha + \beta_1 \Delta X_{it} + \varepsilon_{it} \qquad \text{Instruments: } X_{it-3} \qquad (5.7)$$

Where X represents characteristics of board of directors, namely proportion of non-executive directors *NED*, duality *DUAL*, board size *BSIZE*, director ownership *MOWNER*, presence of board sub-committees *AC, RC, NC*; and control variables.

Table 5.9 shows the results of first stage regression and Cragg-Donald statistics for system GMM estimates, using ROA as a proxy for corporate performance. The table shows the *F*-statistics by regressing every variable on all the lagged differences used as instruments (ΔX_{it-2}) and the *F*-statistics for the variables in differences by regressing every variable on all the lagged levels included as instruments (X_{it-3}). Table 5.9 shows that *F*-statistics for all the first stage regressions are significant, which indicates that instruments have significant explanatory power for the endogenous variables. Further, the *F*-statistics values

are bigger than the critical value (10) for evaluating instrument strength suggested by Staiger and Stock (1997). In addition, Table 5.9 also reports the Cragg-Donald statistics, which are 39.542 for levels equations and 38.935 for the differenced equations. Both values of Cragg-Donald are more than the critical value from Table 5.1 of Stock and Yogo (2005), attached to the appendix I. This suggests that any bias from using the instruments is less than 5% of the bias from an OLS regression, with a 5% level of significance.

In addition, the previous tests are carried out using Tobin's Q as a measure of corporate performance. Table 5.10 reports first stage regression and Cragg-Donald statistics for GMM using Tobin's Q as a proxy for corporate performance. The results are similar to those obtained in Table 5.9 with ROA as corporate performance measure. F-statistics for all the first stage regressions are significant, which indicates that the instruments have significant explanatory power for the endogenous variables. Further, the Cragg-Donald statistic values for the levels equations and the differenced equations exceed all the critical values from Table 5.1 of Stock and Yogo (2005). This implies that any bias from using the instruments is less than 5% of the bias from an OLS regression, with 5% level of significance. In conclusion, the results of the tests for the strength of the instruments of the GMM model document that the findings of the GMM estimates are not affected by weak instruments.

Table 5. 9 First Stage Regression and Cragg-Donald Statistics for GMM (ROA proxy for corporate performance)

Report the F-statistics and R^2's of OLS first stage regressions of levels and first differenced variables on lagged differences and lagged levels respectively.

Panel (A) : Dependent Variable X is in levels			
	F-Statistic	p-value	R-Square
NED	16.790	0.000	0.076
DUAL	17.060	0.000	0.078
BSIZE	18.560	0.000	0.084
MOWNER	16.770	0.000	0.076
AC	16.770	0.000	0.076
RC	16.840	0.000	0.077
NC	22.330	0.000	0.099
SALESG	16.960	0.000	0.077
CAPITE	19.550	0.000	0.088
FSIZE	28.990	0.000	0.125
LEV	16.770	0.000	0.076
R&D	41.220	0.000	0.169

Cragg-Donald Statistic 39.542

Panel (B) Dependent Variable (ΔX) is in first-differences			
	F-Statistic	p-value	R-Square
NED	5.300	0.000	0.027
DUAL	5.220	0.000	0.027
BSIZE	5.240	0.000	0.027
MOWNER	5.470	0.000	0.076
AC	5.260	0.000	0.027
RC	5.280	0.000	0.027
NC	5.310	0.000	0.027
SALESG	6.710	0.000	0.034
CAPITE	5.230	0.000	0.027
FSIZE	7.890	0.000	0.040
LEV	12.350	0.000	0.061
R&D	11.450	0.000	0.057

Cragg-Donald Statistic 38.935

Table 5. 10 First Stage Regression and Cragg-Donald Statistics for GMM (TQ proxy for corporate performance)

Report the F-statistics and R^2's of OLS first stage regressions of levels and first differenced variables on lagged differences and lagged levels respectively.

Panel (A) Dependent Variable X is in levels			
	F-Statistic	p-value	R-Square
NED	17.290	0.000	0.079
DUAL	15.810	0.000	0.072
BSIZE	19.960	0.000	0.090
MOWNER	16.690	0.000	0.076
AC	17.110	0.000	0.078
RC	17.930	0.000	0.081
NC	18.340	0.000	0.083
SALESG	17.520	0.000	0.080
CAPITE	15.790	0.000	0.072
FSIZE	28.090	0.000	0.122
LEV	174.630	0.000	0.463
R&D	16.460	0.000	0.075

Cragg-Donald Statistic 141.183

Panel (B) Dependent Variable (ΔX) is in first-differences			
	F-Statistic	p-value	R-Square
NED	2.460	0.001	0.013
DUAL	2.420	0.001	0.013
BSIZE	2.500	0.001	0.013
MOWNER	2.380	0.001	0.012
AC	2.360	0.001	0.012
RC	2.360	0.001	0.012
NC	2.370	0.001	0.012
SALESG	2.920	0.000	0.015
CAPITE	2.410	0.001	0.013
FSIZE	3.380	0.000	0.018
LEV	184.590	0.000	0.493
R&D	6.960	0.000	0.035

Cragg-Donald Statistic 131.313

5.3.4 The Impact of the lagged Board of Directors on Corporate Performance

So far, the main focus of the analysis has been on the impact of current structure of board of directors on current corporate performance. However, there is a possibility that the current structure of board of directors has an impact on future corporate performance. In other words, a one-period lagged variable for the structure of board of directors might determine corporate performance. To examine this impact, this study follows Wintoki *et al.* (2012) and estimates the following model:

$$CP_{it} = \alpha_1 + k_1 CP_{it-1} + k_1 CP_{it-2} + \beta BOD_{it-1} + \gamma Control. V_{it-1} + \mu_{it} + \varepsilon_{it} \quad (5.8)$$

Where *CP* represents corporate performance, *BOD* represents characteristics of the board of directors, namely proportion of non-executive directors *NED*, duality *DUAL*, board size *BSIZE*, director ownership *MOWNER*, presence of board sub-committees *AC*, *RC*, *NC*: and control variables.

It has been suggested that the use of a lagged variable of board of directors on current corporate performance has two important advantages (Wintoki *et al.*, 2012). First, it allows examination of the impact of the board of directors on corporate performance using a different set of assumptions. Second, it allows the researcher to run an alternative GMM regression that does not depend on the instrumental variables which have been used previously. Furthermore, since fixed-effects regressions do not consider the impact of corporate performance on current characteristics of the board of directors, as a consequence these regressions might be biased. This bias can be corrected if there is no simultaneity between corporate performance and characteristics of the board of directors or control variables. In other words, $E(\varepsilon_{it}|X_{it-1}, Z_{it-1}) = 0$ in the equation 5.8. This condition means that the bias-corrected fixed effects regressions may not be applicable when examining the impact of current characteristics of the board of directors on current corporate performance; it can be applicable to examine lagged characteristics of the board of directors on corporate performance.

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Table 5.11 shows the results of estimating the effect of current corporate performance measured by ROA on lagged board characteristics. The results were obtained by using OLS, the dynamic GMM and a bias-corrected fixed-effects estimator applied by Bruno (2005) and Wintoki *et al.* (2012). The results suggest that most lagged characteristics of the board of directors have no relationship with ROA. In particular, the bias-corrected fixed effects suggest that, after taking into account the dynamic aspects of board structure/performance relationship and time-invariant unobservable heterogeneity without invoking the instrument variable procedure of the system GMM model, the impact of most board characteristics on corporate performance continues the same. The only change is that lagged director ownership is significantly positively related to ROA. This conclusion is similar to that reported in Table 5.7 in this chapter.

In addition, conducting the same tests with Tobin's Q as a measure of corporate performance reveals quite different results. Table 5.12 reports the results of estimating the effect of current corporate performance measured by Tobin's Q on lagged board characteristics. Interestingly, results from the system GMM show that there is no relationship between lagged board characteristics and Tobin's Q. Furthermore, the pooled OLS model reports that lagged duality, board size and presence of remuneration committees are significantly positively related to Tobin's Q. This is similar to what has been reported in Table 5.8 by static OLS. However, the bias-corrected fixed-effects model shows that lagged percentage of non-executive directors on the board is the only board characteristic that is significantly related to Tobin's Q.

Table 5. 11 The Impact of lagged board characteristics on Current ROA

All t-statistics are based on robust, firm-clustered standard errors. ***;**;* represent significance at the one percent, five percent and ten percent level, respectively. AR(1) and AR(2) are tests for first-order and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. Hansen test of over-identification is under the null that all instruments are valid. Diff-in-Hansen tests of exogeneity is under the null that instruments used for the equations in levels are exogenous.

	Pooled OLS	System GMM	Bias-Corrected Fixed Effects
NED(t-1)	-2.419	-1.590	-1.092
	0.171	0.804	0.701
DUAL(t-1)	0.736	3.307	-1.690
	0.475	0.300	0.227
BSIZE(t-1)	-0.091	-0.015	-0.109
	0.449	0.970	0.475
MOWNER(t-1)	-0.399	-2.686	6.084*
	0.784	0.676	0.079
AC(t-1)	-4.439*	-1.738	0.539
	0.073	0.842	0.874
RC(t-1)	0.027	-2.526	0.439
	0.980	0.499	0.838
NC(t-1)	2.918***	-0.395	2.4**
	0.000	0.833	0.034
SALESG(t-1)	-2.057**	-2.414*	0.410
	0.013	0.098	0.573
CAPITE(t-1)	20.545***	-2.899	6.101
	0.000	0.875	0.404
FSIZE(t-1)	2.149***	-2.882	-11.93***
	0.000	0.236	0.000
LEV(t-1)	-2.876**	24.895**	1.015
	0.050	0.012	0.642
R&D(t-1)	-49.674***	110.194**	-6.288
	0.000	0.015	0.696
R-square	0.17		0.10
AR(1) test (p-value)		0.000	
AR(2) test (p-value)		0.044	
Hansen test of over-identification (p-value)		0.000	
Diff-in-Hansen tests of exogeneity (p-value)		0.358	

Table 5. 12 The Impact of lagged board characteristics on Current Tobin's Q

All t-statistics are based on robust, firm-clustered standard errors. ***;**;* represent significance at the one percent, five percent and ten percent level, respectively. AR(1) and AR(2) are tests for first-order and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. Hansen test of over-identification is under the null that all instruments are valid. Diff-in-Hansen tests of exogeneity is under the null that instruments used for the equations in levels are exogenous.

	Pooled OLS	System GMM	Bias-Corrected Fixed Effects
NED(t-1)	-0.015	0.030	-0.11***
	0.629	0.571	0.005
DUAL(t-1)	0.027**	0.024	0.016
	0.046	0.430	0.331
BSIZE(t-1)	0.006***	0.002	-0.001
	0.001	0.548	0.955
MOWNER(t-1)	-0.007	-0.008	-0.026
	0.786	0.872	0.391
AC(t-1)	-0.021	0.010	0.02
	0.511	0.947	0.646
RC(t-1)	0.112***	0.006	0.009
	0.000	0.886	0.699
NC(t-1)	0.015	-0.008	0.014
	0.183	0.664	0.234
SALESG(t-1)	-0.04***	-0.035**	-0.01
	0.000	0.043	0.350
CAPITE(t-1)	-0.223***	-0.111	0.144*
	0.000	0.366	0.088
FSIZE(t-1)	0.009	0.009	-0.051**
	0.257	0.795	0.025
LEV(t-1)	0.719***	-0.973***	0.46***
	0.000	0.000	0.000
R&D(t-1)	0.065	-0.449	0.509***
	0.574	0.260	0.005
R-square	0.39		0.20
AR(1) test (p-value)		0.000	
AR(2) test (p-value)		0.000	
Hansen test of over-identification (p-value)		0.001	
Diff-in-Hansen tests of exogeneity (p-value)		0.454	

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5.3.6 The determinants of the Board Structure in a Dynamic Framework

The analysis so far has mainly focused on finding out the impact of the board of directors on corporate performance. The main assumption for this analysis is that control variables, which represent a certain number of a firm's characteristics, affect the structure of the board of directors. In other words, it is assumed that exogenous components of these control variables have a minor impact on the board of directors' structure. Although prior corporate governance studies have suggested that this is correct (See for example, Boone *et al.*, 2007, Linck *et al.*, 2008, Lehn *et al.*, 2009), these prior studies have ignored the main sources of endogeneity in the relationship between board of directors and corporate performance, which are simultaneity, unobservable heterogeneity and the possible impact of past corporate governance on control variables (Guest, 2009, Wintoki *et al.*, 2012).

In this section, the study examines whether the firms' characteristics are determinants of the structure of the board of directors, using generalized method of moments (GMM) regression. In other words, it investigates whether control variables play a role in forming board of directors' characteristics. The following model is used to find out this relationship:

$$BOD_{it} = \alpha + \sum_s k_s BOD_{it-s} + \gamma Control.V_{it} + CP_{t-1} + \mu_i + \varepsilon_{it} \qquad s = 1, ..., p \quad (5.9)$$

Where *BOD* represents each characteristic of the board of directors, namely proportion of non-executive directors *NED*, duality *DUAL*, board size *BSIZE*, director ownership *MOWNER*, presence of board sub-committees *AC, RC, NC*; *Control.V* is control variables, and *CP* represents corporate performance measured by ROA and Tobin's Q.

Table 5.13 shows the results, and compares the results obtained from the dynamic panel GMM estimator with those obtained from OLS using ROA as a proxy for corporate performance. The GMM results show that, after controlling form simultaneity, time-invariant unobservable heterogeneity and the possible impact of past board characteristics on current control variables, sales growth, capital expenditure, and firm size are the only

determinants of board size (column 7) and presence of nomination committees (column 15). These results are quite different from those obtained from OLS estimates of a static model. For example, the OLS results show that, while sales growth, capital expenditure, firm size and R&D expenditure are determinants of the proportion of non-executive directors on the board, the GMM results show that none of the control variables play a role in determining the proportion of non-executive directors on the board.

Additionally, even after using Tobin's Q as a measure of corporate performance in Table 5.14, the results continue to have the same trend. The GMM results show that, after controlling form simultaneity, time-invariant unobservable heterogeneity and the possible impact of past board characteristics on current control variables, sales growth, capital expenditure and firm size are the only determinants of board size and presence of nomination committees. This is exactly the same results reported in Table 5.13 by using ROA as a proxy for corporate performance.

The results of the system GMM estimator in Table 5.14 show that firm size is significantly positively related to board size, suggesting that large firms require a larger board of directors. Further, the significant positive relationship between firm size and board size indicates that bigger firms today are likely to have larger board size. These results are similar to those obtained from OLS estimates of a static model in recent studies such as those by Boone et al. (2007) and Linck et al. (2008), and to those obtained from GMM estimates model by Guest (2009) and Wintoki et al. (2012) in the US. In addition, the presence of nomination committees is significantly negatively related to sales growth and capital expenditure, and positively to firm size. This indicates that firms that have suffered from low sales and large firms are likely to form nomination committees.

Despite the limited number of control variables that are determinants of two of the characteristics of the board, the results from the GMM regression indicate that it is still important to control for the dynamic relationship between current board characteristics and past corporate performance and time-invariant unobservable heterogeneity in data analysis. Further, one important fact that emerges from this analysis is that the results of the examination for the determinants of board of directors have shown different trends from

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OLS estimation of a static model to estimation using the dynamic GMM panel estimator. This is consistent with what has been reported in earlier analysis in this chapter of the effect of board characteristics on corporate performance in Table 5.11 and Table 5.12. This in turn supports the idea that the use of GMM provides robust results in the present study.

Table 5. 13 The determinants of the Board Structure (ROA measures corporate performance)

The GMM models include one lag of the dependent variable. Year and industry dummies are included in all specifications. All t-statistics are based on robust, firm-clustered standard errors. ***;**;* represent significance at the one percent, five percent and ten percent level, respectively.

	NED		DUAL		BSIZE		MOWNER		AC		RC		NC	
	OLS	GMM	OLS	GMM	OLS	GMM	OLS	GMM	OLS	GMM	OLS	GMM	OLS	GMM
SALESG	-0.016**	-0.004	0.023*	-0.009	0.171*	-0.165	0.026***	-0.004	-0.007	0.001	-0.006	-0.001	-0.08***	-0.041**
	0.011	0.538	0.068	0.246	0.078	0.104	0.006	0.531	0.337	0.919	0.445	0.900	0.000	0.022
CAPITE	-0.071*	0.055	0.288***	-0.145	-0.906	0.059	0.058	0.089	0.029	0.016	0.09*	0.06	-0.174	-0.44*
	0.097	0.607	0.005	0.366	0.275	0.971	0.344	0.377	0.343	0.737	0.055	0.358	0.214	0.094
FSIZE	0.049***	0.027	-0.017***	0.016	2.051***	1.957***	-0.044***	-0.001	0.009***	0.004	-0.012**	-0.007	0.135***	0.136**
	0.000	0.199	0.002	0.512	0.000	0.000	0.000	0.982	0.002	0.716	0.018	0.655	0.000	0.041
LEV	0.014	-0.038	-0.049**	0.04	-0.764***	0.275	-0.031*	0.023	0.024**	-0.003	0.072***	0.005	-0.024	0.164
	0.276	0.402	0.049	0.579	0.005	0.681	0.058	0.614	0.020	0.872	0.000	0.879	0.479	0.107
RD	0.099**	0.129	-0.127	0.044	5.533***	0.921	-0.041	0.184	0.047	0.032	0.015	0.024	-0.161	-0.38
	0.023	0.461	0.108	0.887	0.000	0.646	0.472	0.412	0.340	0.657	0.796	0.793	0.282	0.415
ROA(t-1)	-0.001***	-0.002*	0.001***	0.001	0.001	-0.006	0.001***	0.001	-0.001	-0.001	0.001	-0.001	0.002***	0.001
	0.008	0.063	0.010	0.912	0.983	0.426	0.000	0.371	0.199	0.754	0.232	0.657	0.001	0.976
R-square	0.184		0.037		0.380		0.115		0.026		0.031		0.184	
AR(1) test (p-value)		0.000		0.000		0.000		0.000		0.923		0.011		0.000
AR(2) test (p-value)		0.012		0.161		0.001		0.240		0.787		0.970		0.068
Hansen test of over-identification (p-value)		0.002		0.004		0.000		0.003		0.510		0.094		0.009
Diff-in-Hansen tests of exogeneity (p-value)		0.154		0.996		0.967		0.802		1.000		1.000		0.138

Table 5. 14 The determinants of the Board Structure (Tobin's Q measures corporate performance)

The GMM models include one lag of the dependent variable. Year and industry dummies are included in all specifications. All t-statistics are based on robust, firm-clustered standard errors. ***;**;* represent significance at the one percent, five percent and ten percent level, respectively.

	NED		DUAL		BSIZE		MOWNER		AC		RC		NC	
	OLS	GMM	OLS	GMM	OLS	GMM	OLS	GMM	OLS	GMM	OLS	GMM	OLS	GMM
SALESG	-0.015**	-0.005	0.024*	-0.008	0.205**	-0.163	0.027***	-0.002	-0.005	-0.001	-0.003	-0.001	-0.079***	-0.046**
	0.017	0.419	0.06	0.308	0.039	0.157	0.006	0.802	0.465	0.98	0.752	0.881	0	0.015
CAPITE	-0.084**	-0.003	0.326***	-0.111	-0.691	0.12	0.09	0.123	0.032	0.012	0.121**	0.059	-0.094	-0.457*
	0.048	0.983	0.002	0.519	0.387	0.941	0.144	0.221	0.304	0.798	0.013	0.361	0.505	0.075
FSIZE	0.047***	0.01	-0.014***	0.016	2.043***	1.864***	-0.042***	0.004	0.008***	0.003	-0.012**	-0.009	0.141***	0.128**
	0.000	0.633	0.007	0.418	0.000	0.000	0.000	0.868	0.003	0.778	0.012	0.512	0.000	0.032
LEV	0.011	-0.03	-0.07**	0.05	-1.168***	0.456	-0.046**	0.028	0.009	-0.003	0.028*	0.014	-0.067*	0.119
	0.482	0.519	0.013	0.479	0.000	0.508	0.020	0.585	0.488	0.876	0.067	0.674	0.100	0.194
RD	0.13***	0.119	-0.183***	-0.026	5.531***	0.913	-0.092*	0.167	0.059	0.029	-0.003	0.027	-0.281*	-0.368
	0.002	0.506	0.010	0.921	0.000	0.671	0.096	0.481	0.276	0.720	0.969	0.769	0.054	0.339
TQ(t-1)	0.009	0.007	0.021	0.025	0.554**	0.144	0.014	0.005	0.023***	0.002	0.059***	0.014	0.043	-0.058
	0.437	0.793	0.287	0.669	0.017	0.708	0.348	0.879	0.002	0.789	0.000	0.340	0.148	0.252
R-square	0.182		0.036		0.382		0.112		0.028		0.037		0.181	
AR(1) test (p-value)		0.793		0.000		0.000		0.000		0.924		0.011		0.000
AR(2) test (p-value)		0.005		0.165		0.002		0.192		0.817		0.887		0.081
Hansen test of over-identification (p-value)		0.001		0.002		0.000		0.003		0.520		0.097		0.006
Diff-in-Hansen tests of exogeneity (p-value)		0.216		0.999		0.966		0.721		0.999		1.000		0.127

5.4 Summary

This chapter examines the relationship between characteristics of the board of directors and corporate performance for UK listed firms. The board of directors is the core of corporate governance and plays a crucial role in modern firms. Therefore, examining this relationship is very important to explore and understand corporate governance. An important contribution has been made by applying GMM as a method to correct the endogeneity problems. Up to date, the vast majority of corporate governance studies have considered two sources of endogeneity. First, unobservable heterogeneity, which occurs when the dependent and control variables are affected by unobservable factors. Second, simultaneity which occurs when independent and dependent variables are determinants of each other.

However, corporate governance studies have often ignored another source of endogeneity which arises from likely dynamic relationships among firms' observable characteristics (Wintoki et al., 2012). This means that current changes in a firm affect the firm's future performance and, as a consequence, affect the firm's future changes to the board of directors. This study examines the relationship between board of directors and corporate performance taking into account the possibility that firms' observable characteristics are dynamic. Specifically, this study employs the generalised method of moments estimator (GMM) for panel dataset over the period 1999 to 2009 to examine the relationship between board characteristics and corporate performance. This study examines the percentage of non-executive directors on the board, duality, board size, director ownership, and the presence of board sub-committees.

The results of this study suggest that board structure is partly determined by past corporate performance. Considering this, the results document that there is no relation between characteristics of the board of directors and corporate performance measured by Tobin's Q. However, the use of return on assets as a measure of corporate performance reveals that director ownership is the only factor that is significantly and positively related to corporate performance. The results also indicate that the findings of prior empirical studies that

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examine the relationship between board of directors and corporate performance may be bias since they do not take dynamics into account.

Chapter 6
Conclusions and Implications

Introduction

This chapter focuses on the conclusions of this study, and seeks to highlight five points. First, it presents a summary of the findings of the empirical chapters, which examine the relationship between level of compliance with the corporate governance regulations, characteristics of the board of directors, and corporate performance. Second, it discusses the recommendations that can help to improve the practices of corporate governance in UK listed firms. Third, the chapter discusses the contribution of this research. Fourth, it mentions the limitations of this research; while the last point explores the possibility of future research areas.

The rest of the chapter is organised as follows. Section 6.1 summarises the findings of this research. Section 6.2 discusses the implications and recommendations of the research findings. Section 6.3 mentions the contributions of this study; while section 6.4 explains the limitations of this research. Section 6.5 detects the possible avenues of future research in corporate governance. Finally, section 6.6 gives a summary of the whole chapter.

6.1 Research Findings

Recent corporate governance recommendations require UK listed firms to comply with a number of corporate governance mechanisms. These mechanisms aim to improve corporate performance and ensure that directors act in the best interests of shareholders. A review of the current empirical literature suggests that most prior corporate governance studies have focused on US firms, which have different characteristics to firms in different countries. For example, unlike the US, corporate governance recommendations in the UK adopt a voluntary approach which requires listed firms to comply or justify, while in the US corporate governance recommendations are legal requirements which have to be followed by listed firms. As another example, US boards have been dominated by non-executive directors, while UK boards have a majority of executive directors (Main and

Johnston, 1993, Rosenstein and Wyatt, 1994). Arguably, the UK corporate governance framework represents a different environment in which to explore the relationship between corporate governance recommendations and corporate performance.

In addition, academic studies have been attempting to investigate different aspects of corporate governance such as board characteristics, director ownership, board sub-committees; and then link these aspects to corporate performance. Typically, they have used research methodology to compute the impact of certain aspects of corporate governance on corporate performance. For example, Gompers, Ishii and Metrick (2003) have created an index based on the provisions of anti-takeover, and they report a relationship between their index and corporate performance. La Porta *et al.* (2002) assume that provisions of company act legislation can be explained by a set of measures computing investor protection. Similarly, companies that manage databases use a similar approach of tick-box methodology to rank the quality of a firm's corporate governance systems. However, most corporate governance studies have focused on US firms, where corporate governance is essentially mandatory in nature. This raises an important question regarding whether the findings of these studies are applicable for most countries.

This research attempts to examine whether a higher level of compliance with the governance regulations is associated with a higher corporate performance. Specifically, this study develops a corporate governance index to examine its impact on corporate performance. In addition, it also examines the relationship between board characteristics and corporate performance. It has used 435 UK listed firms from 1999 to 2009 to investigate the relationship between corporate governance on corporate performance. Distinct from prior UK empirical studies, the association between corporate governance and corporate performance is investigated by using three different regression models, which are the ordinary least square (OLS), fixed-effects model, and generalised method of moments (GMM). The reason for this is to find out the impact of research methodology on research findings and subsequent explanations.

This section summarises the findings of this study, which have been discussed in Chapters Four and Five. Specifically, subsection 6.1.1 summarises the research findings based on

the level of compliance with the governance index, which has been discussed in Chapter Four. Subsection 6.1.2 summarises the results based on the relationship between characteristics of the board of directors and corporate performance documented in Chapter Five. Subsection 6.1.3 reports the research findings based on the effects of firms' characteristics on the governance index and board structure reported in Chapters Four and Five; while subsection 6.2 discusses the implications of the findings of this research. The contribution and limitations of this study are discussed in section 6.3 and section 6.4. Section 6.5 suggests the possible scope of future research. Finally, section 6.6 presents a brief summary of the whole chapter.

6.1.1 The Relationship between the Governance Index and Corporate Performance

As has been discussed in Chapters Two and Three, the literature has examined the relationship between corporate governance and corporate performance from two different angles. First, it assumes that corporate governance mechanisms, as a whole, affect corporate performance. This requires a construction of a measure in accordance with a set of corporate governance requirements, and then the impact of the level of compliance with the constructed index linked to corporate performance. Second, it examines the link between each corporate governance characteristic and corporate performance in isolation. As has been mentioned in Chapters Two and Three, and documented in Chapters Four and Five, this study adopts both viewpoints to find out the link between corporate governance and corporate performance. This subsection presents the compliance level with the governance index.

In general, the findings that have been reported in Chapter Four suggest that there are considerable variations in levels of compliance with the governance index among UK listed firms. On average, the level of compliance ranges between a minimum of 49% to a maximum of 99%, with average compliance of 80% for all UK listed firms in the sample of this study. Overall, the distribution of the sample has shown that, despite the predictions of the publication of Higgs and Smith Reviews (2003) and updated versions of the Combined Code on Corporate Governance, there are still considerable variations in the level of compliance with each corporate governance provision among UK listed firms.

However, the results show that the level of compliance has increased over the period of testing. Specifically, the average of compliance in 1999 was 69%, and has improved by about 19% to be about 88% in 2009. Furthermore, consistent with prior studies (See for example, Black *et al.*, 2006b, Henry, 2008), the level of compliance is explained in the light of industry to find out whether the level of compliance can be explained by industry. Specifically, the findings suggest that, on average, oil and gas companies complied most with the corporate governance requirements, while technology companies were the least compliant.

Hypothesis one of this study is that there is a significant relationship between the governance index and corporate performance. Using the generalised method of moments (GMM), the findings based on the governance index model shown in Chapter Four suggest that there is no significant relationship between the governance index and corporate performance measured by return on assets and Tobin's Q. However, the use of ordinary least square and fixed-effects model has shown that the governance index has a significant positive impact on corporate performance. This may explain the positive relationship that has been reported by a number of studies that examined the relationship between an index and corporate performance. (See for example, Gompers *et al.*, 2003, Padgett and Shabbir, 2005, Cui *et al.*, 2008). For example, using OLS regression models, Dahya and McConnell (2007) and Padgett and Shabbir (2005) report a positive relationship between corporate governance and corporate performance in UK listed firms.

In addition, the insignificant relationship between the governance index and corporate performance indicates that firms that comply with the corporate governance recommendations do not necessarily have higher profitability and higher market value than their counterparts that do not comply. As has been mentioned in Chapter Two, this result is not consistent with what has been reported in prior studies (See for example, Gompers *et al.*, 2003, Beiner *et al.*, 2006, Henry, 2008). For example, using the governance indices of different prior studies, Bhagat and Bolton (2008) report a positive relationship between the indices and operating performance. In contrast, this finding is inconsistent with the results of Arcot and Bruno (2007) who report that compliance with the recommendations of

corporate governance does not always lead to higher corporate performance. However, theoretically, reporting insignificant relationship between the governance index and corporate performance is unexpected, since complying with the corporate governance best practice should essentially be considered as a good sign for perspective investors.

6.1.2 The Relationship between Board of Directors and Corporate Performance

This study also examines the core mechanism of corporate governance, which is the board of directors. It examines the characteristics of the board, focusing on percentage of non-executive directors on the board, duality, board size, director ownership, and the presence of board sub-committees. The second hypothesis investigated whether there is a positive relationship between percentage of non-executive directors on the board and corporate performance measured by the ROA and Tobin's Q. The results reveal that there is no relationship between percentage of non-executive directors on the board and corporate performance. This is inconsistent with the recommendations of corporate governance best practice that encourage listed firms to appoint more independent non-executive directors to the board. This empirical evidence also may highlight the impact of different regression models on the findings. For example, a number of prior studies have used either OLS or fixed-effects models and reported a significant and negative relationship between percentage of non-executive directors on the board and corporate performance (See for exampl, Yermack, 1996, Klein, 1998, Bhagat and Black, 1999, Bhagat and Black, 2002).

However, using OLS for 311 UK listed firms, Weir, Laing, and McKnight (2002) find that there is a weak relationship between proportion of independent non-executive directors on the board and corporate performance measured by return on assets for the period 1994 and 1996. Furthermore, this is also not in line with the recommendations of corporate governance best practice. This finding means that there is no empirical support for hypothesis two of this study. This finding does not support the results of Shivdasani and Yermack (1999), which indicate that the presence of non-executive directors on the board leads to an increase in firm value. However, it is consistent with the result of Franks, Mayer and Renneboog (2001), which suggests that a board with a higher proportion of

non-executive directors is not effective due to lack of information about the firm. and appointing non-executive directors is not likely to bring the required skills.

The third hypothesis is that here is a negative relationship between duality and corporate performance. The findings document that duality has no impact on corporate performance measured by ROA and Tobin's Q. This result indicates that hypothesis three cannot be accepted. It also does not support the recommendations of corporate governance best practice that different individuals should be appointed in the roles of board chairman and chief executive officer. However, this conclusion seems to be conflicting with the results of prior studies that report a significant negative relationship between duality and the ROA (See for example, Rechner and Dalton, 1991, Haniffa and Hudaib, 2006). Furthermore, it also does not support the suggestions of Jensen (1993) and Hermalin and Weisbach (1991), who suggest that among other things, splitting the positions of chairman and CEO strengthens the monitoring ability of the board.

However, the insignificant and negative relationship between duality and Tobin's Q suggests that from the market's viewpoint duality is not an important element, which does not support the recommendations of corporate governance best practice. Empirically, the insignificant relationship between duality and Tobin's Q is consistent with the findings of prior studies (Vafeas and Theodorou, 1998, Weir et al., 2002, Dahya et al., 2009b). Specifically, the finding provides empirical support to the results of Dahya et al., (2009b) and Weir et al., (2002) who report that UK firms splitting the combined chairman and CEO positions to comply with the requirements of the code of best practice show no certain improvement in corporate performance measured by Tobin's Q compared with their counterparts.

The fourth hypothesis is that there is a positive relationship between board size and corporate performance. The findings suggest that there is no relationship between board size and corporate performance measured by the ROA and Tobin's Q. The insignificant association between board size and corporate performance indicates that hypothesis four can be rejected. Empirically, the result of no relationship between board size and corporate performance backs the findings of a number of prior corporate governance studies that

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have reported that board size has no impact on corporate performance (See for example, Bhagat and Black, 2002, Ferris *et al.*, 2003). In contrast, the result is inconsistent with the prior studies that report board size has a positive impact on corporate performance (See for example, Adams and Mehran, 2005, Beiner *et al.*, 2006, Henry, 2008), and those that report that board size has a negative impact on corporate performance (See for example, Yermack, 1996, Cheng *et al.*, 2008, Guest, 2009).

The fifth hypothesis asked whether there is a positive relationship between director ownership and corporate performance. The results document that director ownership is significant and positive associated with the ROA, while it is insignificant and negative with Tobin's Q. This indicates that the fifth hypothesis can be accepted. The insignificant and negative relationship between Tobin's Q and director ownership presents weak support to the entrenchment hypothesis. This hypothesis suggests that with a high level of managerial shareholding, the directors may have enough voting rights to secure their positions in the firm and focus on their own benefits, ignoring the minority shareholders. However, the significant and positive relationship between director ownership and the ROA is consistent with a number of prior studies that found director ownership improves the corporate performance (See for example, Mehran, 1995, Holderness *et al.*, 1999, Core and Larcker, 2002).

The sixth hypothesis examined whether or not there is a positive relationship between the presence of board sub-committees and corporate performance. The findings show that there is no relationship between the establishment of board sub-committees and corporate performance. This suggests that there is no empirical support for the sixth hypothesis. It also offers no support for the recommendations of corporate governance best practice that require listed firms to establish remuneration and nomination committees. Theoretically, it is expected that the establishment of board sub-committees should improve the monitoring ability of the board and, as a result, improve corporate performance.

Empirically, the findings of prior studies report mixed evidence. For example, Weir and Laing (2000) report that presence of a remuneration committee has a positive effect on corporate performance in a sample of 200 UK listed firms for the period 1992 and 1995.

Furthermore, using 128 UK listed firms over the period from 1996 to 2000, McKnight and Weir (2009) report that the presence of a nomination committee is significant and negatively associated with corporate performance. In addition, Bozec (2005) reports that there is no relation between the presence of remuneration and nomination committees and corporate performance; while audit committees have a negative impact on corporate performance. However, it is worth mentioning that all these studies examine the impact of board sub-committees ether by OLS or fixed-effects models.

6.1.3 The Impact of Firms' Characteristics on the Board of Directors

The main objective of this study is to investigate the impact of corporate governance on corporate performance. However, there is a possibility that current corporate governance mechanisms affect future corporate performance. This means that past corporate governance structure determines current corporate performance. Considering that possibility, the findings of this study indicate that its results are robust to different performance measures, namely the ROA and Tobin's Q. The findings also show that among firm's characteristics, only firm size is the main determinant of the governance index. In addition, the findings show that firm size is also the determinant of board size, whereas sales growth, capital expenditure, and firm size are the main determinants for the establishment of nomination committees.

6.2 Implications of the Research Results and Recommendations

6.2.1 Compliance with the Governance Index

The differences in the level of compliance with the governance index can suggest several implications. First, the analyses reveal that, although the governance index has no relation to corporate performance, it has increased over the period under examination. This implies that the efforts by the Financial Reporting Council, the Financial Services Authority and the London Stock Exchange, among others, to improve the practice of corporate governance have been generating considerable improvements. The evidence of improving corporate governance compliance among UK listed firms also implies that the voluntary

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approach to corporate governance recommendations seems to be suitable in the context of the UK. A noticeable advantage of the corporate governance voluntary approach is that, unlike the compulsory approach in the US, it allows the codes of best practice to be added to listing rules so that listed firms can comply with it.

Furthermore, the findings also suggest that, despite improvements in the level of compliance with corporate governance recommendations, there are still considerable differences in compliance among firms and among certain provisions of the recommendations. An additional investigation of the level of compliance indicates that the observed variety in the level of compliance among listed firms can mainly be interpreted in the light of the different industry sectors. Theoretically, this is predicted since compliance with the corporate governance regulations has its cost, which some companies in certain industries, such as oil and gas, can afford compared with other companies in different sectors. For example, the highest level of compliance was by the Oil and Gas sector, while the lowest was by the Technology sector. This, as has been mentioned in Chapter Four, is because the Technology sector in the UK is dominated and marked by foreign investors. It has been mentioned that the main motivation leading this trend is the growth potential of the company and the availability of skilled human resources.

In addition, the level of compliance is considerably high with some corporate governance provisions and low with others. For example, although almost all UK listed firms have established an audit committee, less than 50% of UK listed firms have held three meetings or more, as required by the corporate governance best practice. Given that some of these corporate governance provisions are crucial in improving important characteristics of the board, such as independence, monitoring and accountability, the London Stock Exchange and the Financial Services Authority may further increase their observation of the level of compliance among listed firms. The London Stock Exchange may, for instance, establish a special committee to check periodically the level of compliance, and make its recommendations accordingly.

Finally, the findings suggest that the level of compliance with the recommendations of the corporate governance seems to receive the same consideration by different parties. The

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results presented in Chapter Four indicate that a higher level of compliance is not associated with a higher return on assets (see Table 4.10). Given the fact that the return on assets is a profitability measure reflects the current financial situation, if level of compliance has a significant impact for long-term rather than short-term, then ROA might not be able to capture this impact. However, non-significant relationship between the governance index and corporate performance is also supported by the findings based on Tobin's Q (See Table 4.11). Given the fact that Tobin's Q is a measure that reflects possible growth in the future and is preferred by investors, a higher level of compliance is not considered a positive sign by investors, who expect to get returns on the their investments from future growth.

6.2.2 The Characteristics of the Board of Directors

Based on the results of Chapter Five, several implications can be discussed. First, the findings suggest that, regardless of the corporate performance measure used, percentage of non-executive directors has no significant impact on corporate performance in UK listed firms. This does not support the recommendations of the Combined Code on Corporate Governance or the general trend in the UK to include more non-executive directors in corporate boards. As has been mentioned above, empirically this is not a surprise given the number of prior empirical studies that have reported a negative or no relationship between non-executive directors and corporate performance. The appointment of non-executive directors may have been made to meet the requirements of corporate governance rather than for their contribution to the decision-making process in the board meetings. It may also be possible that non-executive directors suffer from lack of necessary knowledge about the operations of the firms where they work. This suggests that the experience of having more non-executive directors may need to be meaningfully improved before expecting it to have a positive impact on corporate performance. This may be conducted through creating special training programmes for newly appointed non-executive directors.

Second, the findings indicate that combining the roles of board chairman and CEO seems to have no significant impact on corporate performance. This result does not support the recommendations of corporate governance codes for UK listed firms to split the roles.

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However, this finding seems to be consistent with what has been reported by Dahya et al.. (2009b), who find firms splitting the roles of board chairman and CEO did not experience better corporate performance than those that combined the roles. In contrast, the result is contradictory to the suggestions of Jensen (1993) and Hermalin and Weisbach (1991), who suggest that combining the roles of chairman and CEO leads to weakening the monitoring ability of the board of directors.

Third, the findings indicate that board size has no significant impact on corporate performance. This result seems to be in line with a number of prior studies that have indicated board size has no impact on corporate performance (For example, Bhagat and Black, 2002, Ferris *et al.*, 2003). On the other hand, the finding does not support the findings of prior studies that have reported board size has a significant negative impact on corporate performance (For example, Yermack, 1996, Guest, 2009). This finding may imply that the choice of corporate board size depends on the circumstances of each firm, since there is a clear-cut answer regarding the right board size for a firm.

Fourth, the findings suggest that managerial shareholdings have a significant impact on corporate performance measured by ROA, but not significant with Tobin's Q. This indicates that higher directors' ownership seems to be associated with director entrenchment. This also suggests that director ownership is assessed differently by different parties. As has been mentioned before, the ROA is preferred by directors and reflects the current values, whereas Tobin's Q predicts the future growth opportunities and is preferred by perspective and current investors. However, this finding is consistent with McKnight and Weir (2009) and Coles, Lemmon, and Meschke (2005), who indicate insignificant and positive relationship between director ownership and Tobin's Q. Finally, although the establishment of board sub-committees has been recommended by all the combined codes, the presence of these committees has no significant impact on corporate performance. This finding raises a question about to what extent board sub-committees are effective, since almost all UK listed firms have, to a large extent, formed these committees. For example, in 2009 about 99% of UK listed firms established audit committees and remuneration committees (see Table 4.1).

The next section will discuss the contribution of this research to the present corporate governance literature.

6.3 Contributions

Prior corporate governance studies which have used the index approach have mainly focused on US firms (See for example, Gompers *et al.*, 2003, Bhagat and Bolton, 2008, Bebchuk *et al.*, 2009), and used the provisions of US corporate governance regulations to structure their corporate governance indices. Arguably, this limits the generalisation of their conclusions for other countries. However, UK studies that have used the index approach (For example, Arcot and Bruno, 2007, Shabbir, 2008), either suffered from survivorship, like the study of Shabbir (2008), who focuses only on 115 UK active firms over the period from 2000 to 2003, ignoring other firms; or have used only a limited number of corporate governance previsions, like Arcot and Bruno (2007), who use only eight corporate governance provisions to structure their governance index. However, unlike this study, Padgett and Shabbir (2005) and Arcot and Bruno (2007) have used UK firms, but not panel data set.

This study makes several new contributions to the literature that has investigated the relationship between corporate governance and corporate performance. First, few studies on UK corporate governance have used panel data to examine the relationship between corporate governance and corporate performance (Short and Keasey, 1999, Ozkan and Ozkan, 2004, Guest, 2008, Guest, 2009, McKnight and Weir, 2009). Furthermore, none of the above mentioned studies have used the most up-to-date and comprehensive data, which makes this study different from the existing studies on corporate governance in the UK. Also, the majority of the above mentioned studies have used data up to 2002. The use of panel dataset for quite a long period of time ensures that the results are less likely to be biased by the particular time period under investigation and allows the researcher to employ appropriate econometric methods to control for endogeneity.

In addition, none of the above studies have included a corporate governance index in their empirical investigation to measure whether compliance of the UK firms with the

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recommendations of the Combined Code on Corporate Governance is a determinant of firms' value. Further, although the governance index approach has been widely used in investigating the relationship between corporate governance and corporate performance, all the published studies so far have only employed ordinary least square or fixed-effects models. This study examines the relationship between its governance index and corporate performance by using ordinary least square, fixed-effects and generalised method of moments.

6.4 Limitations

Like any empirical study, this study may have its own limitations, which need to be mentioned. First, although the sample size of 435 UK listed firms is relatively large compared with prior UK studies (Weir *et al.*, 2002, Mangena and Pike, 2005, Ozkan, 2007, McKnight and Weir, 2009), there is considerable difference between the sample size of each year. This could affect the results of each year of the regression models reported in Chapters Four and Five. In addition, since this study covers an eleven-year period of time, there are a number of corporate governance reviews and reports that have been published during this period, which could have an impact on this study's results. For example, the Higgs Review and the Smith Review (2003) and the updated versions of the Combined Codes on Corporate Governance cover the whole period 2003, 2006 and 2008.

Furthermore, the sample of this study does not include the financial sector, for regulatory and capital structure reasons. This is generally consistent with prior corporate governance studies (Vafeas and Theodorou, 1998, Weir *et al.*, 2002, Dahya *et al.*, 2009b), which facilitated comparing the results of this study with prior studies. These weaknesses could possibly limit the generalisation of the findings of this study. Also, the structure of the governance index of this study may have validity and reliability issues. The governance index was built according to binary coding technique, not ordinal coding technique. However, binary coding technique has been criticised for its low informative ability (Barako *et al.*, 2006, Hassan and Marston, 2010a). Likewise, the governance index uses equal weight for each corporate governance provision; this technique has been also

criticised for giving equal importance to each provisions, which is theoretically and practically not consistent (Barako *et al.*, 2006).

However, because of a general lack of theoretical basis that could be used to build a governance index taking into account the importance of each corporate governance provision, using binary technique avoids subjective judgements about each corporate governance provision. Moreover, using binary technique facilitates the comparison with prior corporate governance studies that have used the same technique to build their governance index (Gompers *et al.*, 2003, Black *et al.*, 2006b, Arcot and Bruno, 2007, Henry, 2008, Morey *et al.*, 2009).

Finally, corporate performance may be affected by macro-economic changes and the general situation of the economy. For example, in times of economic boom, firms seem to have a higher corporate performance, while during economic recession firms seem to have a lower corporate performance (Turner Review, 2009, Walker Review, 2009). The anecdotal evidence of the current financial crisis may affect the last three years of the period of this study.

Consequently, the results of this study have to be explained in the light of the above mentioned limitations. Also, these limitations could be possible areas for future studies. Therefore, the next section discusses the possible areas for future studies.

6.5 Future Research

There are several possibilities for future studies and improvements, which can be based on this research. First, this study has mainly focused on the relationship between a number of corporate governance mechanisms, which have been recommended by regulators, and corporate performance. However, there are several players that affect corporate governance and corporate performance, such as financial markets, labour markets, and companies' law, amongst others. Future studies may investigate the interaction between corporate governance best practice and the financial environment. Second, given the current financial crisis and the debate about the payment of high bonuses for directors, future studies could

pay attention on how to create a clear system that links bonuses of directors to corporate performance.

In addition, future research could be conducted to improve the reliability of the governance index of this study by using a weighted index. The weighted index can be structured by using an ordinal technique, which may generate different findings. Furthermore, more information about corporate governance variables could be collected in more details, to improve the variables. For example, more information about director ownership could be gathered, so that it can be differentiated between director ownership of non-executive directors and executive directors; or type of director ownership, whether it is in the form of options or shares. Also, the external ownership could be categorised by UK investors and international investors to find the different impacts of each. Finally, since the vast majority of corporate governance studies have used secondary data to examine corporate governance issues, it would be interesting to investigate these issues by using qualitative research methodology, such as interviews with directors, who may have different view about corporate governance system in their firms.

6.6 Summary

The main focus of this chapter has been on presenting the findings of this research. It attempts to provide a summary of the findings of this study. Regarding this, it presents the findings of compliance with the governance index and the characteristics of the board of director. The findings document that the level of compliance with corporate governance best practice has shown a significant increase over the whole period. However, there are considerable differences in the level of compliance among UK listed firms. The findings based on the governance index suggest that a high level of compliance with corporate governance regulations has no significant impact in improving corporate performance. This conclusion has been reported by return on assets, which is the measure of profitability, and Tobin's Q, which measures the future growth of a firm. In addition, characteristics of the board of directors have shown no significant impact on corporate performance. These characteristics include presence of non-executive directors, duality, board size, director ownership, and the establishment of board sub-committees.

In addition, this chapter attempted to highlight the contribution of this research. This thesis has contributed to the current corporate governance literature in several ways. This study has used up-to-date panel dataset for a quite long period of time. Additionally, this study has constructed a comprehensive governance index based on UK corporate governance requirements, which are different from the requirements of other countries; and includes more corporate governance provisions than prior UK studies (Padgett and Shabbir, 2005, Arcot and Bruno, 2007). Furthermore, unlike prior studies that employed a governance index, this study has used three regression models, which are OLS, fixed-effects and generalised method of moment, to examine the impact of corporate performance and corporate governance.

As with any academic study, this research has also its own limitations, which this chapter has acknowledged. The sample of this study excluded the financial sector because it is more intensively regulated than other sectors, and this may have limited the generalisation of the findings of this research. The governance index of this study was structured according to a binary technique, which ignores the different importance among corporate governance provisions. This may limit the reliability of the governance index and consequently the findings of this research. The definition of the corporate governance variables may not be comprehensive due to data limitations. For example, the external ownership could differentiate between institutional investors and individual investors. /for another example, director ownership could be divided into two categories to include ownership by executive directors and non-executive directors. Additionally, the corporate performance of UK listed firms may be affected by the financial crisis; therefore, any reduction in corporate performance may not be because of issues related to corporate governance.

Finally, this chapter has mentioned the possible areas for future studies and improvements. The main focus of this study is to find out the impact of corporate governance provisions on corporate performance. Future research can examine the impact of the external environment, such as markets and legal requirements, on corporate performance. Furthermore, the current financial crisis has highlighted that, although some firms have

experienced a reduction in their profits, directors' bonuses have shown a considerable increase. This may be an interesting area for future research, to find out the association between the directors' payments and corporate performance. Finally, since the sample of this research does not include the financial sector, future studies can examine the impact of corporate governance on corporate performance in the financial sector.

Appendix (I)

Appendix (I): Table 5.1. Critical values for the weak instrument test based on TSLS bias (Significance level is 5%)

K_2	$n = 1, b =$				$n = 2, b =$				$n = 3, b =$			
	0.05	0.10	0.20	0.30	0.05	0.10	0.20	0.30	0.05	0.10	0.20	0.30
3	13.91	9.08	6.46	5.39								
4	16.85	10.27	6.71	5.34	11.04	7.56	5.57	4.73				
5	18.37	10.83	6.77	5.25	13.97	8.78	5.91	4.79	9.53	6.61	4.99	4.30
6	19.28	11.12	6.76	5.15	15.72	9.48	6.08	4.78	12.20	7.77	5.35	4.40
7	19.86	11.29	6.73	5.07	16.88	9.92	6.16	4.76	13.95	8.50	5.56	4.44
8	20.25	11.39	6.69	4.99	17.70	10.22	6.20	4.73	15.18	9.01	5.69	4.46
9	20.53	11.46	6.65	4.92	18.30	10.43	6.22	4.69	16.10	9.37	5.78	4.46
10	20.74	11.49	6.61	4.86	18.76	10.58	6.23	4.66	16.80	9.64	5.83	4.45
11	20.90	11.51	6.56	4.80	19.12	10.69	6.23	4.62	17.35	9.85	5.87	4.44
12	21.01	11.52	6.53	4.75	19.40	10.78	6.22	4.59	17.80	10.01	5.90	4.42
13	21.10	11.52	6.49	4.71	19.64	10.84	6.21	4.56	18.17	10.14	5.92	4.41
14	21.18	11.52	6.45	4.67	19.83	10.89	6.20	4.53	18.47	10.25	5.93	4.39
15	21.23	11.51	6.42	4.63	19.98	10.93	6.19	4.50	18.73	10.33	5.94	4.37
16	21.28	11.50	6.39	4.59	20.12	10.96	6.17	4.48	18.94	10.41	5.94	4.36
17	21.31	11.49	6.36	4.56	20.23	10.99	6.16	4.45	19.13	10.47	5.94	4.34
18	21.34	11.48	6.33	4.53	20.33	11.00	6.14	4.43	19.29	10.52	5.94	4.32
19	21.36	11.46	6.31	4.51	20.41	11.02	6.13	4.41	19.44	10.56	5.94	4.31
20	21.38	11.45	6.28	4.48	20.48	11.03	6.11	4.39	19.56	10.60	5.93	4.29
21	21.39	11.44	6.26	4.46	20.54	11.04	6.10	4.37	19.67	10.63	5.93	4.28
22	21.40	11.42	6.24	4.43	20.60	11.05	6.08	4.35	19.77	10.65	5.92	4.27
23	21.41	11.41	6.22	4.41	20.65	11.05	6.07	4.33	19.86	10.68	5.92	4.25
24	21.41	11.40	6.20	4.39	20.69	11.05	6.06	4.32	19.94	10.70	5.91	4.24
25	21.42	11.38	6.18	4.37	20.73	11.06	6.05	4.30	20.01	10.71	5.90	4.23
26	21.42	11.37	6.16	4.35	20.76	11.06	6.03	4.29	20.07	10.73	5.90	4.21
27	21.42	11.36	6.14	4.34	20.79	11.06	6.02	4.27	20.13	10.74	5.89	4.20
28	21.42	11.34	6.13	4.32	20.82	11.05	6.01	4.26	20.18	10.75	5.88	4.19
29	21.42	11.33	6.11	4.31	20.84	11.05	6.00	4.24	20.23	10.76	5.88	4.18
30	21.42	11.32	6.09	4.29	20.86	11.05	5.99	4.23	20.27	10.77	5.87	4.17

Notes. The test rejects if g_{min} exceeds the critical value. The critical value is a function of the number of included endogenous regressors (n), the number of instrumental variables (K_2), and the desired maximal bias of the IV estimator relative to OLS (b).

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