CORPORATE OWNERSHIP AND CONTROL STRUCTURES AND FIRM PERFORMANCE: EVIDENCE FROM CONTROL POTENTIAL, AGENCY, AND CONTROL DOMINANCE-CONTESTABILITY PERSPECTIVES ON UK LISTED FIRMS

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PhD THESIS

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DURHAM BUSINESS SCHOOL

DOCTORAL THESIS SUBMITTED TO:

DURHAM UNIVERSITY

UK

FEBRUARY 2011

In the Name of Allah, the Most Merciful and the Most Magnificent

PRELIMINARY

Corporate system is the outcome of the human innovation that has resulted in the transformation of property ownership system to the modern corporate property ownership system. It is an important global concern today since the life of every person, including even my mother, to whom this Thesis is dedicated and who is still living on agricultural property knowing nothing about corporate system, is influenced by corporate systems and life.

Millions of individuals and families, and several firms, institutions, and public sectors that are related to our economic and social life own equity shares in corporations. Billions of people and several institutions use or consume the goods and services they need from corporations. Hence, the proper functioning of the corporate system, particularly good performance of corporations, is a matter of concern for us. However, good performance of corporations depends not only on the opportunities arising in the environment that should be grabbed on but also on the human factor that controls the firms and make strategic decisions to grab on the opportunities. This makes corporate control system an important issue. This PhD Thesis is concerned with the analysis of the ownership and control structure and firm performance of listed corporations.

As a curious concerned individual, I undertook this research during my PhD research study at Durham Business School, Durham University, after experiencing life in the society with a developed corporate system and motivated during my studies for degrees in Bachelor of Science in Economics and Business Administration and Masters of Science in Finance and International Business in Denmark.

The PhD Thesis presents several key findings and evidence that support the relevant theoretical frameworks and empirical studies and a new concept of *control dominance-contestability framework,* which is an important contribution to knowledge and the debates around corporate control. It is hoped that concerned researchers will further take upon the issue and contribute their inputs in the due process of innovating corporate control model in general and corporate board model in particular in the best interest of good performance of corporations and the well functioning of the corporate system.

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BY: ABDELLA KORMIE DINGA

MATERIAL ABSTRACT

The research study comprises of two preceding Chapters, three main empirical Parts, and *CONCLUSION*. The first Chapter, ***Introduction,*** presents the overall research objectives and questions of the study based on the existing agency perspectives regarding the issues of control and governance conflicts in modern corporations. The second Chapter, ***Review of Theoretical Frameworks,*** presents a brief account of similarities and differences between the existing theoretical frameworks relevant to the control of corporations. The review identified that the agency theory provides powerful testable models and tools that can be used in the investigation of the agency conflicts and the possible solutions that mitigate the governance problems.

The three empirical *Chapters* follow mainly the ***deductive research approach*** of making statistical inferences using a sample of major UK listed firms in the FTSE All Share Index for the period 2003-2007. ***Chapter Three*** deals with the analysis of the state and trends or evolution of corporate ownership and control structure and some board structures of the UK listed firms. The *Chapter* has been instrumental in preparing the raw materials of ownership and control structure variables that are used in the succeeding two *chapters*. ***Chapter Four*** deals with the analysis of the relationship between ownership structure and performance using aggregate stake of all identifiable blockholders' categories and all external blockholders in the *agency perspective*. ***Chapter Five*** presents analysis of the relationship among ownership, control structures and firm performance using the structural equations framework in the *control dominance-contestability perspective.* Finally, the Thesis closes with a ***Conclusion***.

In summary, the **Theses** of this empirical research study suggest the followings. Firstly, there is the prevalence of multiple significant blockholders in the modern listed firms even when share ownership is dispersed. Secondly, in the presence of multiple significant blockholders in the firm, there is a likelihood that the second-type agency conflicts between large shareholders and minority shareholders exists, and that might be the dominant force that determines the possible control configuration even in listed firms with dispersed ownership. Thirdly and finally, the traditional one-equation modelling and their estimations in the methodology of looking into the relationship of separate share ownership categories or accounting for few of the categories might not precisely identify (1) the blockholders' (control forces') incentives and ability of exerting control over the modern corporations, (2) the problem of endogeneity that might arise in the relationships, and (3) the way significant multiple blockholders interact and share control of the firms. Hence, the use of structural equations modelling and ***control dominance-contestability perspectives,*** in which the roles of blockholders structure control forces, internal and external governance mechanisms, and the problems of endogeneity are accounted for might be appropriate to reveal the control configuration of modern listed firms with multiple large blockholders.

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DECLARATION

I, the author of this PhD Thesis, declare that the Theses and the work presented in this manuscript are my own and have been generated by me as the result of my own original research that does not infringe any third party's copyright or other intellectual property rights. No part of the work that appears in this study has been submitted in support of an application of any other degree qualification in this or any other university. The ideas and material from the work of others have been acknowledged and quotations and paraphrases are suitably indicated wherever other sources of information have been used.

Besides, I declare that Durham University is granted non-exclusive rights to make the Thesis available for others as provided in the regulations and work procedures of the University, and without the infringement of the patent right in accordance with the basic regulations regarding patent protection.

Finally, I would like to honestly declare that any mistake regarding the content of this Thesis is solely mine since it is an independently undertaken research work for the award of the PhD Degree.

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Author: ABDELLA KORMIE DINGA

Signature:

ACKNOWLEDGEMENTS

First of all, let all Praises be to Allah, *Subhanahu Wa ta'ala,* for His help, blessings and guidance, which has enabled me to undertake and complete this work by giving me patience and bestowing me with generous and friendly people and with sustenance in life during the hardship times of the research study. *Alhamdulillahi, Rabbil-alamiin*.

As any other research, this research could not have been achieved without the indispensable guidance and assistance of some great people and institutions.

In general, my thanks are extended to all members of staff at the Durham University in general, and the Durham Business School in particular, for their wonderful resourceful facilities and services they have provided me during my research study. I am grateful to the Registrar Office, the Graduate School, the Main Library and the Information Technology Services (ITS) of the University; and the Doctoral Office, the Library and the ITS of the Durham Business School (DBS). From my the personal experience and the development I have been through as a researcher during the study, it is with unforgettable memory that I will always remember and admire the DBS that I have come to love as a *home of knowledge and human academic development*.

In particular, my special thanks goes to my PhD Supervisors, Professor Rob Dixon, the Dean of the Durham Business School, and Dr. Rebecca Stratling for their valuable supervision and wise guidance, and their encouragements and generous assistance throughout my research study. I will always remember **Professor Rob Dixon** for his understanding and sympathy and for his short but precise words in his feedback comments that have been 'life-saving' guidance and solutions to bottle-necks. Not only as an academic Supervisor, but he deserves my gratitude also as a proactive leader. Moreover, I am greatly indebted and thankful to **Dr. Rebecca Stratling** for her very detailed timely written and oral feedback comments emanating from reading between the lines and providing genuine and quality oriented constructive directions and guidance. She deserves my thanks and admiration not only as an academic Supervisor but also as a well-read researcher and resourceful academic trainer.

Moreover, I express my sincere gratitude to the Durham University Islamic Society and particularly some of its sincere and helpful members and friends that stood by me during the hard times of my study. Also, I express my heartfelt gratitude to **Dr. Trevor Trueman**, my long time British friend with whom I share unforgettable memories that brought us closer together, for being always there for me and encouraging me and especially for supporting me in times of difficulties during the course of the study. Last but not least, I extend my special thanks to my beloved wife, **Mrs. Fatuma *Haj* Abubaker Abdulkarim**, who had been very patient despite her thirst for of my attention and encouraging me by giving morale boosts during the writing up of this Thesis.

May Allah shower His blessings on them all in this world and in the Hereafter, *Amiin*.

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DEDICATION

I dedicate this work to my loving mother, ***Dasitu Yadasa****, who is a poor peasant and an analphabetic smart and intelligent Ethiopian Oromo Lady that never attended any formal education, but who valued education as a way out of poverty and a lead towards a better life that fits with the developments in the environment. My inspiration to do this work is from the lovely mother, who has encouraged her children to get educated with all her limited resources and has succeeded in attaining me as the second PhD holder in the family while waiting for the third kin to be a Medical Doctor as a replacement of what she used to dream to come out of me.*

Apologizing to her for the lag to achieve this dream of hers by quitting my education early and involvement in politics for years, I express my thanks and great admiration for her moral support during this research study and for her patience and perseverance in waiting for this achievement to come true after long years and for encouraging other family members to get education without being discouraged by my early choice of destiny.

May Allah, the Almighty Only True God, bless her with guidance and bestow her sustenance and longer life, Amiin.

Chapter One

INTRODUCTION: THE RESEARCH

1.1 THE RESEARCH OBJECTIVES

The research deals with the investigation of corporate ownership and control structure and its impact on firm performance in listed firms using the UK data. The theme has been an important research area of corporate governance, which deals with the various governance arrangements used to control the corporation within the objective function of maximizing shareholders (owners) wealth. The importance of the theme has been highlighted in research literature based on the suggestion of the existence of governance problems in corporations related to divergence from shareholders' value maximization. The premise is that there is conflict of interest between management and shareholders (Berle and Means, 1931; Jensen and Meckling, 1976), and between large controlling blockholder(s) and minority shareholders (Demsetz and Lehn, 1985; Shliefer and Vishny, 1986, 1997; Holderness 2003), which leads to the appropriation of shareholders.

As corporate conflict is a corporate governance issue, it is worthwhile to define corporate governance in accordance with the purpose of this study. The definition varies depending on the issue to deal with and on the inherent outlook to be reflected, which is described by Gillan (2006, p382) as "one's own view of the world". The later refers to shareholders perspective (defines the objective function of firms in terms of shareholder value maximization) and stakeholders perspectives (defines the objective function of firms in terms of stakeholder value maximization). Overall, the wider definition of corporate governance from scholars is based on the organizational perspective. For instance, Zingales (1997) writes that corporate governance deals with the directing and control mechanisms that ensure proper organisation of business, the formation and management of joint stock companies, company law provisions on capital, the regulations through bylaws and statutes of manager-shareholder relations, the procedures for the appointments of the boards, and the definition of the respective responsibilities of managers, boards, and officers of a corporation. Similarly, Tricker (1984, p.10) writes: "Governance is different from management; and involves setting the corporate direction, involvement in executive action, supervision and accountability." This shows that corporate governance is more than management. In short, Gillan and Starks (1998, p.382) states that it is the system of laws, rules, and factors that control operations at a company.

However, the definitions based on organizational context are too general and they do not provide theoretical frameworks that can be tool for modelling or testing relationships. The popular theoretical framework that provides such a relationship is the agency theory, which defines corporate governance in the context of the agency relationship that focuses mainly on the intra-firm conflicts of control. The baseline definition provided by Denis and McConnell (2003) relates corporate governance to the affirmation of the private property rights of the shareholders as owners of the company. The starting point for establishing relationships in the firm is hence to assume that investors (shareholders) are the rightful owners of the company.

One such definition of corporate governance in terms of economic interests and conflicts worth to mention is from Shleifer and Vishny (1997, p737). They write that it "deals with the ways in which suppliers of finance to corporations assure themselves of getting a return on their investment". The suppliers of finance referred here include not only shareholders but also creditors. The general corporate control framework is that it is not possible for the entire prevalent multiple owners in a firm to make the decision on running a corporation, and hence, only few are delegated to act in the best interest of all owners. In such a situation, *governance problems* (conflicts of interest between those who control the corporation and the shareholders) arise if the shareholders do not get the expected returns on their investments. The premise of the definitions is that the resulting agency costs due to the conflicts reduce firm performance lower than when the owners have control of the firm. Hence, corporate governance issues or problems are irrelevant in the absence of agency problems in corporations (Hart, 1995).

Moreover, the agency relationships and the conflicts that ensue from the relationship might lead to private benefit of control and the expropriation of the wealth of owners (Shleifer and Vishny, 1997, Dyck and Zingales, 2004), bankruptcy or liquidation (Jensen and Meckling, 1976), etc. which are agency costs, are detrimental to the investors and to the corporation as a whole. From this point of view and the need to mitigate the problems, Zingales (1998) defines corporate governance as the complex set of *constraints* that determine the arrangement and the distribution of the surplus rents generated by the firm. Similarly, considering the insiders as agents in the relationship, La Porta et al. (2000, p.4), write: "Corporate governance is, to a large extent, a set of mechanisms through which outside investors protect themselves against expropriation by the insiders." Hence, the objective of corporate governance might be to ensure the defence of shareholders' value (Tirole, 2001).

Furthermore, according to the agency perspective, the governance relationship the firm faces is also extended to its environment. Regarding this, Keasey et al. (2005, p.251) define corporate governance as "the set of mechanisms – both institutional and market based – that induce the self-interested controllers of a company (those that make decisions regarding how the company will be operated) to make decisions that maximize the value of the company to its owners (the suppliers of capital)." Hence, the agency theory asserts that besides the internal institutional mechanisms like the board of directors, the market based mechanisms like debt financing, takeover markets, stock markets, and managerial labour markets also mitigate the agency conflicts (Fama and Jensen, 1983; Morck et al, 1989).

Now that corporate governance is defined in terms of agency perspectives, it is vital to discuss the types of conflicts inherent in the firm. The classical agency theory is based on the classical principal-agent conflicts. One important thing to note is that the classical principal-agent theory is based on the theoretical assumption of the *separation of ownership from control* proposed in the seminal work of Berle and Means (1932). The classical principal-agent theory assumes that managers are agents delegated to decide on behalf of suppliers of finance (principals) that are not involved in the day-to-day running of the business. The basic control premise of the theory is that corporations are controlled by the management not the owners (shareholders). In this setting, the principal-agent problem, which is related to the conflict of interests between owners and managers, might result in agency costs that affect shareholder returns (Jensen and Meckling, 1976; Sappington, 1991). Hence, the shareholders-manager conflict is the classical principal-agent problem, which is the governance problem to be dealt with by corporate governance.

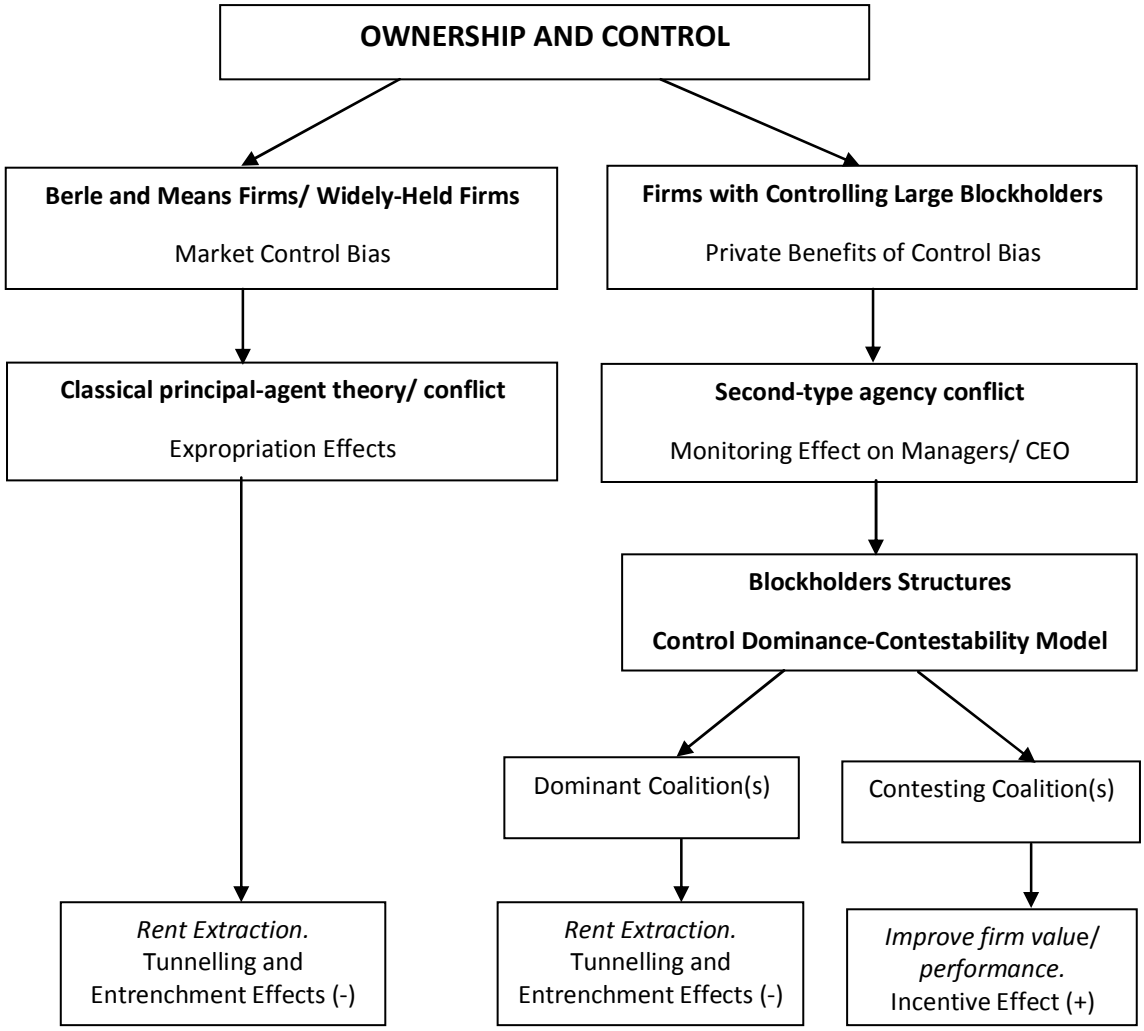
Literature provides extensive theoretical framework on the causes or reasons for the shareholders-managers conflict, the consequences of the conflict and how the conflict can be resolved or reduced in the agency perspective. The conflict arises because managers have the tendency to diverge from shareholders' interests and follow their own objectives and act in their own best interests at the expense of shareholders. It can be argued that the reason for potential divergence of preferences are, on the one hand, that professional managers only tend to hold small stakes in the firms they run and therefore might be more interested in personal benefits via high pay, perks and shirking and less in long-term firm performance than other shareholders. On the other hand, it might be suggestive that those managers who do have high ownership stakes in the firms they operate tend to have highly concentrated investment portfolios (via firm investment and employment), which is likely to lead to a divergent risk attitude compared to more widely diversified shareholders. Such self-interest serving opportunity exploited by the managers might arise in firms with poor performance and those that are characterised by the absence of effective monitoring and disciplining mechanisms.

Empirical research triggered by the shareholders-manager conflict show important insights into the consequences of the conflict in which managers of such firms are more likely to adopt suboptimal strategies and resist takeovers. The findings show that well entrenched managers (1) choose long term debt (Guney and Ozkan, 2005; Datta et al., 2005), (2) hold large amounts of cash (Jensen, 1986; Ozkan and Ozkan, 2004; Ferreira and Vilela, 2004; Harford et al., 2008), (3) prefer leverage below the optimal capital structure (Berger et al., 1997; de Jong and Veld, 2001; Brounen et al., 2006), (4) undertake overinvestment (Goergen and Renneboog, 2001; Pawlina and Renneboog, 2005), (5) pay lower dividends than others (Hu and Kumar, 2004; Khan, 2006), and (6) exhibit significant underperformance (Morck et al., 1988; McConnell and Servaes, 1990; Gompers et al., 2003; Davies et al., 2005; and Core et al., 2006).

Hence, the detrimental effect of the agency costs on the performance of the firm has called for suggestive mechanisms to mitigate the problem. A strand of the literature that focuses on the correlation between different governance mechanisms and agency costs suggest that firms can reduce the agency costs and enhance their performance by designing and adopting appropriate external and internal governance practices that mitigate or control the costly incentives of managers, thus limiting the potential for suboptimal managerial behaviour (Jensen and Meckling, 1976; Fama and Jensen, 1983; Walsh and Seward, 1990; Rediker and Seth 1995; Weir et al., 2002).

The classical corporate finance literature based on the principal-agent perspective dealt with the problem of dispersed share ownership where (1) no shareholder has significant stakes, and (2) ownership is concentrated in the hand of a large shareholder that has effective control over the firm (Berle and Means, 1932; Jensen and Meckling, 1976; Grossman and Hart, 1980; Shleifer and Vishny, 1986; Burkart et al., 1997). In Berle and Means (1932) *widely-held firms* share ownership is assumed to be completely separated from control (*figure 1.1)*. However, later empirical studies have shown that corporate share ownership is typically concentrated in the hands of multiple large shareholders (La Porta et al, 1999; Barca and Becht, 2001; Becht and Mayer, 2002). The evidence that many companies have multiple large shareholders and the view that some multiple controlling large shareholders might exert control or monitoring pressure has shifted the traditional principal-agent conflict between shareholders and managers (Berle and Means, 1932) towards another form of agency conflict between large controlling shareholders and minority shareholders. The later governance problem is termed as the *second-type agency conflict (figure 1.1)*.

Fig. 1.1: Theoretical framework of firm ownership and control of corporations



Source: Modified and constructed from Gutierrez and Pombo (2009). The part from blockholders structure and the control dominance-contestability model is modified based upon the Thesis of this research.

In a firm where the controlling shareholder exists, the agency theory suggests two views. On the one hand, it is argued that large controlling shareholders can benefit minority shareholders by exerting monitoring control over managers (Shleifer and Vishny, 1986, 1997). On the other hand, it is suggested that large controlling shareholders might be harmful to minority shareholders if they pursue their own private goals that diverges from shareholders' wealth maximization or if they reduce valuable managerial incentives (Shliefer and Vishny, 1997; Burkart et al., 1997) and expropriate minority shareholders by diverting funds towards the generation of private benefits (Barclay and Holderness, 1989; Barclay et al., 1993; Zingales, 1994). The large controlling shareholders might influence the firm's decision that might harm minority shareholders. For example, the difference in preferences between dividend payment (probably favoured by small shareholders) and capital gains (likely preferred by large shareholders) might create conflict of interests due to taxation difference (Shliefer and Vishny, 1986).

Moreover, it can be argued that there might be the potential relationship between multiple blockholders in the same firm that interact and share control power (Leech, 1988; Zwiebel, 1995;

Pagano and Roell, 1998; Bennedsen and Wolfenszon, 2000; Gomes and Novaes, 2001; Maury and Pajuste, 2005; Gutierrez and Pombo, 2009). In such setting, there might be multiple blockholders that might either cooperate in pursuing exploitation or in restricting each other's exploitative behaviour. Little is known in literature about the way multiple large shareholders interact and share control power, which is referred to as *blockholders structure* in this research. To fill the gap, this Thesis has developed a *control dominance-contestability model and hypothesis*, which suggests that control of modern corporations in which multiple large shareholders are prevalent, is always contested. This is based on the fact that a single blockholder might not be able to assume majority or absolute control in the firm. The main assumption is that two opposing poles over control of the firm – dominant coalition and contesting coalition – might be formed in order to attain cumulative voting power that creates the incentives and ability to exert control pressure.

Hence, considering the principal-agent problems of governance and the second-type agency conflict between large shareholders and minority shareholders, this research investigates the following important research questions using UK listed firms in the FTSE All Shares Index for the period of 2003-2007: *How is corporate share ownership distributed among ownership categories in the major UK listed firms and how are ownership and control structures and some board structures evolved during the period? What are the impacts of different aggregate blockholder categories on firm performance? What are the possible patterns of blockholders structures that exist in firms, and how do they affect each other and performance?*

Hence, the research study investigated the (1) state and trends in the changes of share distribution among different shareholder categories and the extent and levels of ownership concentration from the control potential perspectives, (2) link between ownership and control structure (blockholders and other ownership variables) and firm performance from the agency perspectives based on the assumption that shareholders with significant voting power have the incentives to control and enhance firm value (Leech and Leahy, 1991), and (3) the way blockholders interact and share control power (blockholders structure) and impact firm performance from the control dominance-contestability perspectives using a panel data from a sample of UK major listed firms in FTSE All Share Index for a period of 2003-2007.

1.2 THE STRUCTURE OF THE THESIS

The research study comprises of two preceding *Chapters*, three *Empirical Chapters*, and *Conclusion*. The first Chapter, ***Introduction,*** presents the overall research objectives and questions of the study based on the existing agency perspectives regarding the issues of governance conflicts in modern corporations. The second Chapter, ***Review of Theoretical Frameworks*****,** presents a brief account of the similarities and differences between the existing theoretical frameworks, which are related to the control of corporations. The review identified that the agency theory provides powerful empirically testable models and tools that can be used in the investigation of the agency conflicts and the possible solutions that mitigate the governance problems. The rest of the Thesis is organized in a working paper format so that it comprises three interconnected empirical chapters. The *Empirical Chapters* are designed in a manner that the succeeding *Part* solves the problem that could not be solved by its predecessor.

Chapter Three of the empirical chapters presents the state and trends of corporate ownership and control structure of the UK listed firms during 2003-2007, during which there was health in the economy. The study is relevant from the following perspectives. Firstly, it is important to investigate the state and evolution in ownership structure primarily and board structure secondarily after the recommendations of the Higgs Report (2003) and the UK Code of 2003 that are preceded by series of corporate governance reforms triggered by financial crises and corporate scandals. Secondly, it is vital to compare the state and evolution of patterns of ownership structure in the UK stock market that is characterized by high liquidity. Thirdly, the issue deemed relevant since it is necessary to compare the state and evolution of corporate ownership structure of the period with the previous empirical evidence from similar studies. Finally, it is important to provide recent evidence using (1) lower control threshold based on the UK mandatory disclosure level (3%) instead of higher cut-offs, (2) recent and panel data instead of old and cross-sectional data, and (3) the concept of aggregate blockholder ownership that provides a continuous measure of ownership and control structure variables instead of the concept of controlling (ultimate) owners that uses dummies to measure owners and ownership concentration.

Chapter Four deals with the analyses of the relationship between ownership structure and firm performance using aggregates of different blockholders categories and aggregates of all external blockholders from the agency perspective using one-equation modelling following similar studies in literature. However, due to the differences and ambiguity of the results, this study undertook the investigation by (1) incorporating all major blockholders categories instead of one or few, (2) using a panel data based on 3% cut-off level instead of cross-sectional data and higher threshold levels for control, (3) controlling for the control effects of governance mechanisms based on the agency perspectives following some similar studies instead of disregarding them in order to avoid omission bias, (4) accounting for dynamic endogeneity relationship between ownership structure and firm performance by including lagged performance variable as independent variable, and (5) making simple pairwise correlation technique to analyse the complementarity and substitution effects between board structure and external governance mechanism.

Chapter Five presents the relationship between ownership control structures and firm performance using the structural equations framework in the control dominance-contestability perspective. In the presence of multiple blockholders and where ownership concentration is very low, control by the major blockholder is absent (Leech, 1988), and hence, control is contestable and there might be the second-type agency conflict. Hence, it might be suggestive that the significant blockholders cooperate to pursue exploitation or restrict other's exploitative behaviour in the interaction to share control power in the firm. This implies that there might be coalitions of blockholders for collective actions (Leech, 1988; Zwiebel, 1995; Pagano and Roell, 1998; Bennedsen and Wolfenszon, 2000; Gomes and Novaes, 2001; Maury and Pajuste, 2005; Gutierrez and Pombo, 2009). The fact that little is done on the theoretical frameworks of the control contestability hypothesis regarding blockholder structures and that there are few studies that investigated the issue empirically, the research theme is found to have relevance and importance for corporate governance. Hence, the study developed a theoretical control dominance-contestability framework, and undertook empirical analysis from the *control dominance-contestability perspective* using structural equations modelling.

1.3 KEY FINDINGS AND CONTRIBUTIONS

The main findings of ***Chapter Three*** are that there are several multiple blockholders in the UK listed firms and that the UK listed firms' share ownership is widely dispersed at the UK mandatory disclosure rule level confirming the previous notion of ownership dispersion from the studies that used higher thresholds.

The contribution of this *Chapter* of the study is that it reveals the evolution and developments in the patterns of ownership and control structures and trends in the evolution of board structures in the major UK listed firms in FTSE All Share Index after the Higgs Report and the 2003 Code of Best Practice of corporate governance and before the inception of the current global financial crisis. Serving as an extension to the previous studies, the study also reveals evidence on the pattern of ownership structure and concentration of the UK listed firms in the period that the previous studies have not covered. Finally, from comparison of the period's average and between years' averages, it might be suggestive that change in the magnitude of ownership might remain almost stable around the mean during five years, thus strengthening the hypothesis of the equilibrium state of ownership structure within a long-run time horizon.

Finally, the key finding of research interest is that the first largest blockholder might not be ultimate (sole) controller of the firm, and that the coalition of the first 5 largest shareholders on average cannot even attain majority control in terms of their aggregate voting power. Hence, this study suggests that individual blockholder might not have the ability to solely control the UK listed firms and that control might be contested in the firms. Hence, the important research issues this initiated are (1) the investigation of the impact of different aggregate blockholders categories and ownership concentration on firm performance, and (2) the way the multiple large shareholders interact and share power (blockholder structure) in the UK listed firms from the *control dominance-contestability perspective*.

Chapter Four reveals the impact of ownership structure variables on firm performance, which could not be observed from undertaking mainly descriptive statistics in the analysis used in *Chapter Three*. Most of the evidence in the *Fourth Chapter* is consistent with some of the existing relevant theories.

The contribution of the study to knowledge is that it provides (1) some comprehensive evidence using some procedures that incorporate some of the main gaps, including the use of all identifiable blockholder categories, regarding the sources of differences in the research literature on the impact of ownership structure on firm performance; (2) the most updated evidence from the recent panel data on the relation between ownership structure and firm performance in the major UK public firms; (3) evidence that confirm the existing agency perspectives on insider ownership, and the second-type agency perspective on the external blockholders in the UK listed firms that have highly diffused ownership; and (4) consistent evidence that confirm some of the premises behind the recommendation in the UK Codes concerning board structure (duality and board size) that negatively influence firm performance.

Finally, the key finding of research interest is that the results on certain important variables such as the proportion of nonexecutive directors and debt financing show surprisingly unexpected evidence inconsistent with the agency theory. This led to the suspicion that the problem might arise from not

properly accounting for the endogeneity relationships in the methodology, and problems in the empirical modelling and analysis, which are accounted for in *Chapter Five.*

Chapter Five reveals the following key findings, among other things. The evidences support (1) the existing agency perspectives on the determinants of firm performance, (2) the agency theory view and the rationale of the UK Code on board structure, (3) the contestability of corporate control, and (4) the endogeneity relationships between board structure and performance, board structure and external governance mechanisms, and ownership structure and performance.

The contribution of *the Chapter* to knowledge is the development of theoretical frameworks of control dominance-contestability model besides providing evidence that confirm (1) the control dominance-contestability hypothesis, and (2) the endogeneity relationships presented above. Overall, the research study indicates that (1) the use of structural equations modelling (SEM) and 3SLS estimation efficiently controls for the endogenous relationships that arise between ownership structure and board structure, ownership structure and firm performance, and board structure and performance, (2) the methodology is well-equipped to handle the far reaching endogeneity problems that plague economic studies and simultaneous involvement of both control dominance factors and control contestability factors, and thereby to reveal the empirical validity endogenous relationships and control dominance-contestability hypothesis, and (3) in contrast to the evidence of negative impact of PNED on firm performance *Chapter Four* of this research and other studies that did not efficiently control for endogeneity using one-equation modelling, the proportion of nonexecutive directors has now positive impact on firm performance, thus confirming the agency perspective, after accounting for endogeneity problem.

Hence, this research study contributes to the existing debate on the how large blockholders interact and share control power, which we refer to as blockholders structure. It particularly expands the existing theoretical *models of control contestability* into a *model of control dominance and contestability.* The model suggests that corporate control configuration might be the outcome of the interaction of several control forces that pursue dominance and contesting depending on the costs and benefits of control.

Now that the research objectives are introduced, it would be important to review the existing theoretical frameworks and its ownership and control structure of the firm as motivational recipe before presenting the three empirical chapters.

Chapter Two

REVIEW OF THEORETICAL FRAMEWORKS

2.1 INTRODUCTION

The assumption of neoclassical theory regarding governance issues in firms is that effort choices and costs are observable, and people act rationally and independently on the basis of full and relevant information. This might imply that there are no transaction costs and there is the ability to write complete contract. Hence, the idea is not related to the manager-owner conflict, even though it might fit to the original entrepreneur model of businesses. Hence, the neoclassical theory does not provide a powerful model to explain the governance issue of modern listed firms.

However, departing from the neoclassical views, the New Institutional Economics (NIE) theories make the assumptions (1) there are transaction costs, (2) there is information asymmetry, and (3) contracts are incomplete to include everything (Williamson, 1979; Grossman and Hart, 1986; Hart and Moore, 1990; Hart, 1995). Finally, the integration bounded rationality (suggested by Simon in 1957) assumption equipped the NIE with a viewpoint of limited rationality of decision-makers (Williamson, 1988; Furubotn, 2001). Bounded rationality implies that a decision maker has only partial knowledge and limited computational power, and that the process of making decision has significant costs (Furubotn, 2001). Hence, the two basic assumptions of NIE proposed by bounded rationality are that (1) the positive transaction costs are ubiquitous and unavoidable, and (2) human decision makers are naturally limited in their computational power – to acquire, store, retrieve, and process information (Simon, 1986; Williamson, 1988; Bardhan, 1989; Furubotn, 2001).

Therefore, this research study uses the NIE, which comprises different fields such as the property rights theory, the transaction cost theory, the agency theory, the resource dependency approach, and the legal approach to finance. So, the assessment of the similarities of the theoretical and empirical tools these NIE fields are made in the following subsections. The NIE fields chosen for assessment that might provide some theoretical explanations and interpretations to the conflict between managers and shareholders are (1) the agency theory, (2) the transaction cost economics (TCE), which was developed and named by Williamson (1985, 1988), and (3) the property rights economics or theory (Coase, 1960; Alchian, 1965; Demsetz, 1967; Alchian and Demsetz, 1972, 1973). *Table 0.2* presents a short summary of comparison of the principal-agent theory, the transaction const theory, and the property rights theory.

2.2 THE AGENCY THEORY

2.2.1 Introduction

The organisational framework of large corporations is a setup in which there are the separation of ownership and control and the principal-agent relationship, the setting in which the owners (principals) hire a managers (agents) to run the firm in the best interest of the owners for a reward for the efforts in return (Jensen and Meckling, 1976, Sappington, 1991; Hart, 1995). Conflict of interests arises in the relationship due to the divergence of managers from the shareholder interest (Jensen and Meckling, 1976; Fama and Jensen, 1983). This view is referred to as the *agency theory*.

Generally, the core assumptions of the agency theory are that: (1) managers may maximize their own utility instead of enhancing shareholder value (Jensen and Meckling, 1976; Demsetz, 1983); (2) information is distributed asymmetrically between principals and agents; (3) contracts are not costless when writing and enforcing (Fama and Jensen, 1983); and (4) the parties have perfect rationality or limited (bounded) rationality. In this setting, agency conflicts might arise resulting in agency costs that would affect firm value.

In the principal-agent relationship, the outcome or performance depends on the extent of the agent's efforts and the risks available. The fact that the level of efforts made or chosen is only observed by the agent (hence asymmetric information) makes it difficult for the principal (owner) to decide the level of compensation for the agent, which should be paid from the realized profit (Sappington, 1991). The conflict of interests arises due to the mismatch of incentives and the parties' behaviour towards risks. Shareholders' incentives are related to future financial and share price performance and the managers' incentives depend on the conditions of their employment contract and remuneration packages. Also, shareholders who provide equity finance expect maximized returns do not bear risks related to firm operations, while managers are risk-bearers, thus implying no risk-sharing between the parties. This might force managers to bear only lower risks. In the setting, it is difficult to measure the future performance and the level of the risk precisely. Hence, it can be argued that both parties face the trade-off between (1) incentives, where the agent should be motivated by creating attractive performance based incentive, and (2) risk sharing, where the agent need to be protected from risk by low performance based incentive. Therefore, agency problem stems from the incentive-risk sharing puzzle (Hart, 1995). The relevant principal-agent question is thus how to determine the optimal balance between efficiency and risk-bearing (Sappington, 1991).

The classic principal-agent model, the divergence of managers from shareholder value maximization and pursuing their own interests at the expense of shareholders causes agency problems. Agency costs are incurred in a setting where the level of efforts and intents of decisions made can only be observed by managers, who have competitive information advantage on the company operations. Due to information asymmetry, owners may not know whether managers are making the necessary efforts or the right decisions. The owners incur *monitoring costs* when they attempt to gather information on the behaviour and actions of managers. On the other hand, managers also take upon themselves costs, called *bonding costs*, which is difficult to practically observe, by making efforts at the expense of their own utility and implementing the contractual terms in order to reduce the agency conflict (Jensen and Meckling, 1976).

So, inasmuch as the agents make decisions that deviate from those which would maximize the benefits of the principals, the principals suffer from the losses of potential profits; and the returns that may fall short of the actual level if the owners themselves assume direct control of their firm (Jensen and Meckling, 1976). Regarding this issue, Fama and Jensen (1983) suggest that the agents do not bear the substantial wealth effects of their own decisions, and that managers have the tendency to appropriate perquisites due to opportunism.

However, the agency theory has got its own limitations like other theories. Hart (1995) explains that it does not by itself provide a role for governance structure (or asset ownership) due to the fact that the principal-agent contracts are not optimal or complete enough to provide the best and appropriate incentive scheme and other decision areas. The contractual problem to note is that the incentive is based not directly on efforts but on the future performance. It is obvious that the future performance of the firm can be affected by situations which are outside the control of the managers, who may be blamed or penalised for doing nothing wrong in the absence of terms that protect them. Hence, the best contract formulation to reflect all the future state of the world, which the agency theory does not yet provide, is an outstanding issue of corporate governance.

Nevertheless, the principal-agent theory provides a powerful theoretical basis for explaining the relationships and suggesting solutions for the agency problems between shareholders and managers (Jensen and Meckling, 1976, Fama and Jensen, 1983). The theory provides a useful tool for providing insight into the suggestions for corporate governance mechanisms or arrangements that would mitigate the agency costs and enhance shareholder returns. It also provides the insight into why managers might be rewarded with performance based incentives in the form of stock, and the role of external significant owners in exerting monitoring control. On the other hand, agency theory literature suggests that other external governance mechanisms like takeover markets, debt financing, stock markets, and managerial labour markets also exhibit a monitoring or control function on the behaviours of managers, thus mitigating agency problems (Jensen and Meckling, 1976; Fama and Jensen, 1983).

In conclusion, the important aspect of the principal-agent paradigm is it (1) suggests explanations and the solutions to the different types of agency costs, and (2) provides both dispute avoidance approach by crafting incentive-alignments and conflict resolution approach of crafting governance mechanisms. This makes it a stronger and more intuitive tool than others.

2.2.2 Streams of the Agency Theory

The theory has developed along two lines: *positive agency theory* and *normative principal agent research or theory*. The two streams are supplementary to each other and they share in common (1) the unit of analysis – the contract between the principal and the agent, and (2) the general assumption about people, organisations and information (Jensen, 1983). *Table 2.1* presents the differences between the two streams.

The *positive agency theory* focuses on the broad situations in which the principal and agent are likely to have conflicting goals and then prescribes the governance mechanisms that limit the agent's self serving behaviour. The core assumption of the theory is that individuals *do* maximize their expected utility. So, it recognises much more clearly property rights claims by both agent and principal, which

influence potentially a pareto-efficient outcome in the design of the contracts. Hence, based on this assumption, the theory assumes that private individuals solve these normative problems, and investigates which and how incentives and other elements (for instance, governance mechanisms) affect the determination of equilibrium contracts between principals and agents. This implies that positive agency theory is basically *descriptive*.

Table 2.1: Differences between the two streams of agency theory

Positive Agency Theory	Normative Principal-Agent Theory
Assumes that individuals ***do*** maximize their own expected utility.	Assumes that individuals ***should*** maximize their own expected utility.
Non-quantitative approach.	Generally quantitative and mathematical rigor.
It is descriptive	It is prescriptive.
Empirically oriented.	Non-empirically oriented.
Focus on large, public corporations.	Applies to employer-employee, lawyer-client, buyer-supplier, and other relationships.
Concentrate on modelling effects of aspects of contracting environment and technology of monitoring and bonding in addition to those related particularly to the principal-agent.	Concentrate on modelling effects of the structure of: (1) Preferences of parties, (2) Uncertainty, and (3) Information in the environment.
Deals with general and wider aspects of the relationships.	Deals with specific and focused aspects of the relationships.
Attention on scanning various monitoring and bonding practices and costs to determine contractual forms/ alternatives.	Attention focused on risk sharing and form of optional contracts and on equilibrium (optimal) contracting solutions (without agency costs).

Source: Constructed from Jensen (1983).

On the other hand, the *normative principal agent theory* focuses on how to structure contractual relationships between principals and agents in order to provide incentives for the agent to maximise the principal's welfare in a situation characterised by uncertainty and imperfect monitoring (Jensen and Meckling, 1976). The theory is based on based on the normative assumption that people *should* maximise their own expected utility. Since it tries to focus on shareholder value maximization, the normative principal-agent theory is *prescriptive*. It involves a careful specification of assumptions that are to be followed by logical deductions and quantitative rigor (Jensen, 1983; Eisenhardt, 1989). It attempts to offer recommendations on the design of contracts based on quantitative optimum calculations in its endeavour to establish conditions for optimal contract satisfying quantifiable pareto-optimum criterion.

The research in positive agency theory is less quantitative than the normative counterpart (Jensen, 1983). Its research focuses on the special principal-agent relationship case of large, public corporations. The most influential works in the positive agency theory are: Jensen and Meckling (1976), Fama (1980), and Fama and Jensen (1983). In contrast, the research in the normative stream is more quantitative - abstract and mathematical, in an attempt to quantify every contractual relation and situation mathematically (Jensen, 1983). Organisational theorists criticize positive agency theory as being minimalist (Hirsch et al. 1987; Perrow, 1986) and its methods as justifiably unconstrained and often close to be tautological and lacking rigor or mathematical proof (Jensen, 1983). Moreover, while the normative principal-agent theory literature concentrated on modelling the effects of factors related particularly to principal-agent, such as the structure of preferences of the agents and principals, the nature of uncertainty, and the informational structure available, the

positive agency theory literature concentrated on the effects of additional aspects of contracting environment (for instance, capital intensity, information costs, asset specificity and specialization, capital and labour markets) and the relevant technology of monitoring and bonding (Jensen, 1983). Furthermore, unlike the positive agency theory, which focuses more exclusively on special cases of owner-top manager relationship, the normative principal-agent theory makes focus on a broader and a more general situations that might lead to many more testable research implications. Finally, the normative theory can generally be applied to the employer-employee, lawyer-client, buyer-supplier, and the other agency relationships (Harris and Raviv, 1978), while the positive theory is extended to aspects related to corporations.

The work of Jensen and Meckling (1976) defines the principal-agent relationship and explores the ownership structure of corporation from the positive theory perspectives, especially the role of equity ownership of managers as a mechanism to align the manager's interest with that of owners. Additionally, Fama (1980), and Jensen and Fama (1983) make discussions focusing on the role of efficient capital markets and labour markets as information mechanisms to monitor the behaviour of the top executives. Moreover, Fama and Jensen (1983) describe the role of the board of directors as monitors of the opportunism of the executive managers in large corporations. Later, the positive agency theory is extended to theoretical ideas of the practices of golden parachutes and corporate raiding (Jensen, 1983; Jensen and Ruback, 1983).

Hence, the positive agency theory strives to give the theoretical explanations in terms of the way real world works (Jensen, 1983). So, it is concerned with the explanation of the institutional arrangements (ownership structure, organisational structures, and the markets) that might mitigate the agency conflicts. This makes it closely related to the property rights theory since the effects of the distribution of property rights are important focus in the analysis. Moreover, the positive agency theory has offered a broader and complex view and conception of organizations in general (Jensen, 1983; Eisenhardt, 1989) and resulted in considerable research works. Therefore, recognizing the broader scope and factors that interplay in the principal-agent relationship, it is found that the positive agency theory is the main tool for this research study even though the quantifying procedures in normative principal-agent theory can have a complementary role.

2.3 The Transaction Cost Theory

Even though the agency theory and the TCE have some common perspectives, namely following shareholder view, assumptions of incomplete contracting, risk neutrality of both parties, self-seeking opportunism of human being, the existence of transaction costs, bounded rationality (even though some agency theorists also assume perfect rationality) in managerial discretion, and moral hazard from information asymmetry, they differ in some aspects. The TCE, which takes transaction cost as a unit of analysis. The assumption of limited or bounded rationality has implications for monitoring costs (if perfect rationality prevails there should be no transaction costs including no monitoring costs) and therefore the need to use incentive mechanisms to align preferences.

However, TCE exhibit some differences with classical and neoclassical theories (*table 2.2)*. Firstly, whereas with classical and neoclassical contracts assumptions are that contracts can be (fairly) fully specified, which suggest that relationships can largely be settled using *ex-ante* contracting, the TCE with relational contracts assumptions tend to suggest that due to incompleteness of contracts *ex-post* adjustment mechanisms need to be introduced (Coase, 1960; Williamson, 1979, 1980, 2001).

Additionally, in contrast to the agency theory's focus on the preventative *ex ante* incentive alignment schemes and corporate governance arrangements, the TCE does not give any clear *ex ante* arrangements necessary to prevent conflicts in order to enhance shareholder returns. Finally, unlike the agency theory, the TCE rejects the viability and feasibility of the neoclassical economics view of profit maximization and utility maximization based on the bounded rationality reasoning (Williamson, 1988, 2000; Furubotn, 2001).

Table 2.2: Comparison of the NIE theories

Comparison Items	Agency Theory	Transaction Costs Theory	Property Rights Theory
Unit of Analysis	Principal-Agent Contract.	Transaction.	Institution.
Focal Dimension	Incentives.	Various types of asset specificity.	Property rights.
Focal Cost Concern	Residual loss.	Maladaptation. Holdup problems.	Externalities. Rent-seeking.
Contractual Focus	*Ex ante* incentive alignment, Monitoring mechanisms	Choice of (*ex post*) governance mechanism.	Ex ante property rights allocation and *ex post* distributional conflicts.
Theoretical Orientation	Constrained optimization.	Comparative assessment.	Comparative assessment.
Strategic Intent	Shareholder view.	Shareholder view.	Stakeholder view.
Source of Market frictions	Information asymmetry, unobservability, risk aversion (by agents).	Bounded rationality, uncertainty, information asymmetry, opportunism, and asset specificity.	Externalities, unclearly defined and difficult to enforce property rights (weak appropriability), and vested interests.

Source: Adopted and constructed from Kim and Mahoney (2005)

Therefore, the TCE cannot, for the purpose of this research, be as strong as the agency theory in dealing with the relationship between owners and managers and the investigation of the relationship between ownership and control structure and firm performance. However, it can serve as an alternative tool in providing explanations and interpretations and proposing the *ex post* governance structures in case the contractual terms are not fulfilled. In this respect the TCE exhibits some similarities to the *legal approach to finance*.

2.4 The Property Rights Theory

Another New Institutional Economics (NIE) view comes from the property rights theory (PRT), which gives some theoretical explanations of the ownership structure of corporations. Its approach is associated with the law and economics literature. The research on property rights, initiated by Coase (1960) using the neoclassical economics thought, developed to its peak with Demsetz (1967) and Alchian and Demsetz (1973). Demsetz (1967) defines property rights as an instrument of society expressed in its laws and customs, based on which people, in dealing with each other, form expectations that reasonably hold.

Property rights might be defined as the social institutions' framework that defines or delimits the range of privileges granted to the individual or group who owns specific resources (Mahoney, 2005, Kim and Mahoney, 2005). It is the exclusive authority that determines how a resource is used. The three criteria for the efficient property rights are (1) universality – all resources are owned by someone; (2) exclusivity – the owner has the exclusive rights on the property; and (3) transferability – ensuring the allocation of resources from low to high yield uses (Demsetz, 1967; Mahoney, 2005). The pioneering works of Alchian (1959, 1961), Coase (1960), and Demsetz (1967) Alchian and Demsetz (1972) on the traditional conceptual framework of the PRT, namely how the traditional,

technological, and institutional (including hierarchical authority) constraints enter into the decision processes of assigning property rights that would lead to efficient contractual outcomes. However, discussions of the property rights in the context of NIE and modern listed corporations are later developments. It is worthwhile to mention Furubotn and Pejovich (1972) Libecap (1989), Barzel (1989), North (1990), Eggertsson (1990), Hart and Moore (1990) and Hart (1995) for their important contributions to the modern property rights research literature. From the context of the existence of shareholders and hired managers and the fact that multiple shareholders own one firm, the NIE property rights tends to distinguish, for instance, the right to use, the right to transfer and the right to gain income from the use of an asset as a set of ownership rights which can be distributed across various individuals.

Though yet distinct, the PRT has common antecedents with the transaction costs and agency theories even though it differs from them in that it follows stakeholder view (Kim and Mahoney, 2005). However, condsidering the crucial changes to NIE theory, the PRT assumes that: (1) individuals are assumed to maximize their own utility, (2) transaction costs are recognized as being practically positive, and (3) more than one pattern of property rights can exist and that profit maximization is not assured (Furubotn and Pejovich, 1972). It postulates that managers are able to pursue their own goals and divert the firm away from profit maximization only within certain limits due to certain circumstances in the competitive environment (Furubotn and Pjovich, 1972). The three assumptions are not in much contradiction with the agency theory perspectives.

In contrast to focusing on reducing costs as the TCE and the agency theory do, the property rights theory (1) focuses on improvements in the social welfare by assigning property rights in the presence of constraints or externalities (Kim and Mahoney, 2005), (2) views that property rights have not been assigned to the contractual party with the economic incentive and ability to maximize utilization of the resource, (3) suggests that there are sets of constraints regarding property rights would internalize externalities, thus facilitating cooperation, reducing conflicts and transaction costs (Nabli and Nugent, 1989), (4) incorporates the elements of property rights into the analysis of contracts and of institutions with circumstances inhibiting the failures to reach satisfactory contractual agreements (Libecap, 1989; Eggertsson, 1990; North, 1990).

According to the PRT, ownership is conceptualized as residual control and obligations (Grossman and Hart, 1986; Hart and Moore, 1990). Ownership confers to the owner the residual rights of control over the firm's assets in contrast with the income rights of the neoclassical PRT view. The providers of risk capital (owners) guarantee also to pay the obligations to other contractual partners and therefore protect them from losses, should the overall venture make a loss (up to the liability limitations of shareholders). Therefore, according to the modern property rights theory, the rights to residual control over assets and to residual returns are equated with asset ownership that safeguards the contracting parties from contractual hazard such as *ex post* holdup problems or distributional conflicts.

Given the conceptualization above, the problem with the PRT, firstly, is that it does not give answer to the question of Alchian and Demsetz (1972): *who will monitor the monitor?* The agency theory provides its possible answers to the question, whereas the PRT does not provide governance structures or models as solutions. Hart and Moore (1990, p.1120-21) put residual control rights over assets as "the right to decide how these assets are to be used except to the extent that particular

usages have been specified in the initial contract the ability to exclude others from the use of that asset". The definition is not explicit and the concept is criticized for being ambiguous on the ground that it is difficult to precisely specify residual rights and thus equating residual control rights with ownership (Demsetz, 1998). Hence, the concept of principal-agent relationship in modern listed firms is not explitly established in the PRT. Secondly, even though the PRT provides the contractual focus of the framework of *ex ante* property rights allocation and *ex post* distributional conflicts resolution, it only gives much attention to vested interests like institutions or state (Kim and Mahoney, 2005) in its endeavour to suggest efficient property rights. Thirdly, unlike the agency theory that provides the *ex ante* incentive schemes and monitoring mechanisms as solutions to the contractual conflicts, the PRT suggests only the legal system or institutional framework to define property rights, to enforce property rights and contractual terms in case of conflict. Finally, the PRT is ambiguous in its definition of ownership in its conceptualization of ownership as claimancy of both the residual rights to income (Alchian and Demsetz, 1972) and residual control rights (Grossman and Hart, 1986; Hart and Moore, 1990).

Therefore, the PRT is not as strong as the agency theory, for the purpose of this research in providing the testable relationship between managers and shareholders. However, since it is more satisfactory than the TCE and agency theory in handling the strategic issues of shared ownership (Kim and Mahoney, 2005) the PRT might play the complementarty role.

2.5. CONCLUSION

The degree of applicability of the different NIE theories to the conflict between managers and owners of the firm per se the research's general objectives in the *Introduction* is assessed above. In the review of made above, the three NIE theories are found (1) to deal with the conflict between managers and owners; (2) to have a common view that there are costs (be it agency costs or transaction costs) involved in the control of modern corporations; and (3) to assume that there are externalities that are manifested in residual loss (in agency theory), maladaptation and holdup problems (in transaction cost economics) and costs associated with externalities and rent-seeking (in property rights theory) in their focal cost concern. Moreover, both agency theory and TCE believe that there should be cost reduction even though they differ on *how* the costs are reduced.

However, the three NIE theories differ in the way they approach the contractual framework in their efforts to suggest devices that mitigate the costs or externalities. This might arise from their difference in their unit of analysis. It is only the agency theory that considers principal and agent (as parties to the conflict) and their relationship as a unit of analysis. However, the other two NIE theories (TCE and PRT) fall short of clearly modelling and providing testable hypothesis for managers-owners conflicts since they diverge from managers-owners relationship and conflict as a unit of analysis.

Moreover, as noted above, the TCE and PRT makes focus on the *ex post* governance mechanisms and distributional conflicts respectively, while the agency perspectives focuses on preventive *ex ante* incentive alignment schemes and monitoring mechanisms. Even though, the PRT gives *ex ante* property rights allocation, it does not provide preventive incentive alignment or monitoring scheme as a preventive scheme before defaults to the contractual terms happen. Based on these two

arguments, the agency theory is found to be better equipped than TCE and PRT in the analysis of managers-owners conflicts.

Nevertheless, other theories are not reviewed. Firstly, the stewardship theory, which assumes that managers are rational stewards of shareholders working in the best interest of owners without divergence from shareholders wealth maximization, is not included in the review since it does not serve the purpose of looking into manager-owners conflicts. It does not yet have empirical underpinning and wider acceptance among researchers to beat the alignment of interest hypothesis of the agency theory (Jensen and Meckling, 1976; Jensen, 1993). Secondly, the legal approach to finance is not reviewed because of it focus solely on the *ex ante* and *ex post* institutional governance (law and court) definition of rights and solution respectively to the conflict between managers and owners. The *ex ante* rights allocation in the approach does not provide empirically testable models as the agency theory. Finally, the stakeholder theory is left out of the review because it diverges from the shareholder value maximization perspectives of the objective function of the firm.

To sum up, the agency theory has developed in form and content to the current state by incorporating some of the views of the property rights theory, bounded rationality, incomplete contracts approach in its endeavour to find the *ex ante* contractual relationships. This empowers it to gain a superior position in providing intuitive and testable tool of investigation of relationships and suggestive solutions and explanation of solutions to the principal-agent relationships and conflicts than other theories discussed above.

The important aspect of the principal-agent paradigm is its suggestions of explanations and the solutions to different types of agency costs. In its contractual focus and design, the agency perspectives provide both dispute avoidance approach by crafting incentive-alignments and conflict resolution approach of crafting governance mechanisms. So, this research uses it as the basic theoretical tool even though it employs other theories as alternative or complementary tools.

CHAPTER THREE

THE RECENT EVIDENCE ON CORPORATE OWNERSHIP AND CONTROL STRUCTUES IN THE UK: CONROL POTENTIAL PERSPECTIVE

3.1 INTRODUCTION

The long standing notion of corporate ownership structure is that equity ownership is dispersed in the countries of the UK and the US, whereas it is concentrated in the developed economies of Continental Europe (Franks and Mayor, 1997; Faccio and Lang, 2002). Most of the research studies in the area of ownership structure, and particularly the agency perspectives, often start argument from the Berle and Means (1932) seminal work that warns against the problems ensuing from ownership dispersion, a situation in which ownership is separated from control and managers are in full control of modern firms. The view has been dominating the public policy discussion and academic research in corporate governance for the last few decades.

The notion of diffuse ownership motivated several researchers that have tried to question the validity of the view of Berle and Means (1932) by studying the ownership structure of firms in some economies that has presented evidence of the existence of blockholders even in the UK and the US firms (La Porta et al., 1999; Gadhoum et al., 2005; Holderness, 2003, 2007). Interestingly, investor protection is higher in the UK than the US and this might encourage investors to invest in corporate shares and accumulate blocks of shares. Contrary to this argument is that investor protection might encourage minority shareholders' protection to diversify their portfolio thus discouraging the accumulation of blocks of shares (La Porta et al., 1998; Franks and Mayer, 2002; Franks et al., 2001; Crespi and Renneboog, 2003). Hence, it is important to know the trends of ownership pattern in the higher investor protection regime of the UK.

Moreover, there are series of corporate governance reforms with the objective to curb corporate failures and protect investors since the beginning of 1990s in the UK. From the Cadbury Report (1992) to the Higgs Report (of end of 2002, published in 2003) reform recommendations focused, among other things, on improving corporate board structure, and encouraging shareholders to participate in corporate control. These steps might also have the effect of encouraging investors to invest in firms and to exert their control pressure in their firms besides the investor protection.

Furthermore, since the year 2002 had been the year in which the UK and the world economy showed recovery from the corporate crisis that started at the beginning of the millennium, it is interesting to study the developments or trends in ownership structure and board structure of the UK after the Higgs Report and the publication of the 2003 Code of Best Practice. The year 2007 is also important since it is just before the beginning of the current global financial crisis. It might be arguable that the provisions in the Code that encourage shareholder activism and include reform of the internal control mechanism might create optimism in investors that might encourage them to invest more in the firm or pessimism that drives diversification of portfolio or even divesting. Hence, it is interesting to investigate the pattern of ownership, principally blockholder categories and

ownership concentration and board structure in the UK during the period of good economic health, 2003-2007.

Therefore, the relevant research questions: *how is corporate share ownership distributed in the UK listed firms between 2003 and 2007? What are the features of ownership concentration and blockholder concentration? How has the board structure evolved after the Higgs Report and during the regime of the 2003 UK Code of Best Practice?*[1] *How has the ownership power, which might be the control potential in the firm, of the first largest shareholders evolved during the period?*

Hence, in spite of the popular notion of diffuse ownership in the UK it is still interesting and relevant to know the changes or trends in ownership and control structures of the listed firms during the period 2003-2007. So, this study undertakes investigation of the extent and trend of ownership pattern, ownership concentration, the prevalence of blockholders and the control potential of ownership categories in the major listed firms in the UK.

The relevance of this study is, firstly, related to the corporate governance reforms in the UK. After series of the UK corporate governance and the financial crisis that started in 2000 and the famous corporate scandals (Parmalat and Ahold and then followed by Enron and Worldcom) the Higgs Report was published in 2003. The existing relevant recommendations of the corporate governance reforms (from the Cadbury Report of 1992 onwards) were incorporated in the Combined Code published in 2003.[2] Some of the recommendations incorporated in the UK Combined Code of 200 regarding board structure, which is vital in the control of corporations, are interesting and relevant issues of investigation besides the ownership structure. Hence, this study also analyses, as its secondary objective, the trends and evolution of some internal corporate governance variables and the compliance with the recommendations of the UK Combined Code related to the variables.

Secondly, the relevance of this research study is related to the high liquidity of stock markets in the UK especially in the environmental situation of the period under review. The country is among the prototype countries with a well developed modern stock ownership and corporate system, and the most liquid stock market along with the United States. Regarding liquidity, Rajan and Zingales (2003) rank the UK stock market first or second in the world in previous six decades and among the top five markets in the later three decades of the nine decades of the last century. More diffusion of share ownership might be expected to be facilitated by high liquidity of UK stocks, which might encourage the buying and selling of stocks and the prevalence of blockholders. As already noted, it might be arguable that high market liquidity in the regime of board reforms, high investor protection and encouragement of shareholder activism might lead to accumulation of shares to exert control pressure or diversification of portfolio, which might in turn affect ownership and control structure. Hence, the study might reveal some changes or trends in the ownership patterns of listed firms.

Thirdly, according to the existing similar studies in literature, attempts are made to study and provide ownership structure of the UK firms for the periods up to the beginning of the millennium (recently Marchica and Mura, 2005; Florackis and Ozkan, 2009). The most recently study by Florackis and Ozkan (2009) covers the period of 1999-2005, which includes the period of financial crisis and

[1] Note: There is also a reviewed version of the code published in 2006.
[2] Note: There was a Combined Code of 1998, which was published by the London Stock Exchange in June 1998, and annexed to the Stock Exchange Listing Rules.

corporate scandal of the beginning of the millennium. However, the investigation of ownership and control structure in the period (2003-2007), in which the economy showed some developments and was free from negative shocks, is interesting and relevant. Hence this study includes 2006 and 2007 and, this research on the recent historical (evolutionary) development in the ownership structure might reveal the state, trends and tendencies during the period.

Finally, the relevance of this research is related to the thresholds for identifying blockholders. It is to be recalled that more of the conclusions on the diffuse ownership were drawn from the studies that use (1) higher threshold levels, (2) old and cross-sectional data, and (3) the concept of controlling owner (ultimate controller) at a certain threshold level and considering the rest as diffusely held (La Porta, et al., 1999; Claessens et al., 2000; Faccio and Lang, 2002; Marchica and Mura, 2005; Gadhoum, et al., 2005). However, this study uses a much lower threshold level of 3% (the UK disclosure level), a panel data, and aggregate blockholder ownership in order to investigate the patterns of ownership and control structure and to identify the blockholders that have the incentives or ability to exert control pressures on the management of the UK listed firm. Hence, the investigation of ownership and control structure as well as ownership concentration from the panel data of the UK listed firms when the disclosure level (3%) is used to identify significant blockholders and aggregates of blockholder categories is an interesting relevant issue of this research.

Nevertheless, one of the delimitations worth to mention regarding the study is that the data coverage is from 2003 after the Higgs Report (January 2003). We would like to note that the study is not with the objective to compare changes in ownership and control structures during the period chosen with prior years. It is only concerned with the trends and developments within the period under review. Hence, the option is to compare the results with previous findings on ownership and control structures in the UK listed firms. Finally, this study is not designed to investigate whether the reform in corporate governance has the causal impact on the trends and changes in ownership and control structures of UK listed firms or not, since the issue of accounting for the factors like investors' identity, behaviours, incentives, and ability to exert control pressure is beyond the scope of this study.

The other delimitation of the study is related to board structure variables recommended in the UK corporate governance reform Code. The Combined Code of the UK recommendations that are relevant to this study and are objectively and directly measurable, among others are (1) that most of the board members should be nonexecutive directors (NEDs), especially balance of executive and independent NEDs excluding the chairman who should be independent, (2) that the CEO should not assume the position of chairmanship of the board of directors, which can be traced to Cadbury Report (1992), and (3) that the board should not be so large but sufficient size with the balance of skills and experience. However, the recommendations of the Combined Code of 2003 and 2006 also give more provisions on board independence: mainly that (1) the chairman should hold meetings with the non-executive directors without the presence of the executives, (2) the board composition should have the balancing of executives and NEDs, particularly independent NEDs, and smaller firms should have at least two independent NEDs, and (3) certain criteria should be fulfilled for nonexecutive directors to be independent. The Code provides also recommendations on board subcommittees. Nevertheless, this study is delimited to the use of only objectively identifiable NEDs, CEO-duality and board size, because (1) the principal objective of the research is to investigate the ownership and control structure and their impacts on firm performance in the UK listed firms, (2)

board structure variables are used in the research thesis as control variables for internal corporate governance mechanisms, and (3) as mentioned above, the board variables chosen can be objectively and directly measureable and thus do not involve any subjective measuring decisions, which might be a source of biases.

The main findings of the study are that: (1) the first largest shareholder and even the coalition of the first five largest shareholders in the firm do not attain majority or absolute control over the firm in terms of their voting power; (2) the corporate ownership structure of the listed firms of the UK show ownership dispersion even at the UK disclosure rule level; (3) there is evidence that the presence of more blockholders would not be enough to imply or to conclude that share ownership is concentrated; (4) the level of holdings by blockholders changes across years and across the owners; (5) outside ownership and aggregate block ownership showed steady increases, whereas widely held ownership showed steady decreases during the period; (6) the change in ownership and control structures – blockholder ownership pattern and ownership concentration – is found to be significant for the period between 2005 and 2006 as well as 2006 and 2007; and (7) the trends in the board structure variables in the period confirms more compliance to the provisions of the UK Combined Code of 2003 regarding the proportion of nonexecutive directors, board size and CEO-duality.

The contribution of this study is that it reveals the developments in the patterns of ownership and control structures and trends in the evolution of board structures in the major UK listed firms in FTSE All Share Index after the Higgs Report and the 2003 Code of Best Practice of corporate governance and before the inception of the current global financial crisis. Serving as an extension to the previous studies, the study also reveals evidence on the pattern of ownership structure and concentration of the UK listed firms in the period that they have not covered. Finally, from comparison of the period's average and between years' averages, it might be suggestive that change in the magnitude of ownership might remain almost stable around the mean during five years, thus strengthening the hypothesis of the equilibrium state of ownership structure within a time horizon.

The rest of the *Chapter* is organized as follows. *Section 3.2* briefly accounts for the review of the literature regarding the background of the UK equity ownership that has the motivation effect on this study. This section would also describe the rationale behind the use of the chosen control thresholds and of the identification of blockholder categories. It also will include a short review of the prior research literature in order to identify and fill the gaps. *Section 3.3* deals with the methodology of the research. The results of the analyses would be presented in *section 34*; and this would be followed by discussion and conclusion.

3.2 LITERATURE REVIEW

3.2.1 Background: UK Share Ownership

It is recorded in literature that the British industrial performance at the turn of the 20th century relied on family, and that there were powerful and dominant families, and that family share ownership had been dominant in the British business history and in corporate share ownership (Becht et al., 2009). Gradually, the pattern of share ownership showed changes, where families sold some of their stakes that led to the dilution of ownership. It is recorded that almost two-thirds of the decline in directors' shareholdings over 1900-1950. Becht et al. (2009) explain that the historical change of the pattern of ownership of British firms in the century was primarily due to the immense amount of the waves of takeover activity since 1960s. 1940s and 1950s are marked by the changes in the UK capital markets where (1) minority investor protection was strengthened by improving disclosure and setting up of anti-director provisions after a number of scandals by the end of 1940s, and (2) there was a sharp increase in institutional ownership that became the largest shareholder in several companies by 1960. Hence, family ownership continued to decrease overtime being replaced by other investor categories. On the recent state of family ownership, Becht et al. (2009) write that the largest voting blocs in the UK usually casts less than 10% of votes; and portion of votes casted by families is less than 5%. They add that block of shares owned by families on average is only 5%. This indicates that families have less significance in corporate control in the UK unlike Continental Europe.

Moreover, the survey of the UK beneficial share ownership of the Office for National Statistics (ONS) of the UK, as shown in *table 3.1*, shows how shares are distributed among the principal investor categories. Firstly, it can be seen that individual (family) investors were holding the highest UK shares (54%) in 1963 and that it has decreased overtime up to its 12.80% stake in 2006. The historical evolution of the beneficial ownership of UK shares indicates that foreign ownership (the rest of the world) has been increasing since 1963 (7%) to 40% in 2006. From the trends over the time period, it might be suggestive that the ownership of individual investors has been substituted mainly by the increase in institutional ownership and foreign ownerships. It might also suggest that with the growth in size of corporations, individuals or families might not be able to supply enough capital alone to undertake projects or investment opportunities to a large scale and it might have been be necessary to finance the investments with pooled capital from institutions. It might also be suggestive that the steady increases in foreign ownership in UK firms shown in the *table* might have been facilitated by the financial liberalization that set strong foot in 1980s.

Secondly, the historical development in equity ownership viewed from the *table* confirms that the UK institutional investors are the most significant shareholders, whose holding increased since 1963, attaining its maximum holding of 61.20% of UK equity in 1993, and then decreasing until the period under review, where it is still the highest owner. Regarding this Dubbins and Cuthbert (1985) state particularly insurance companies and pension funds are consistent purchasers of shares of UK quoted companies in the period of 1966-1980. They also suggest that ownership of ordinary shares is of particular interest for investors since the votes attached to the equities give shareholders legal powers to influence management through General Meetings.

Table 3.1: Evolution of beneficial ownership of UK shares; Percent of total equity; 1963-2008

SECTOR	1963	1969	1975	1981	1989	1993	1999	2002	2003	2004	2006	2008
Rest of the World	7	6.6	5.6	3.6	12.8	16.3	33	35.9	36.1	36.30	40.00	41.5
Individuals	*54*	*47.4*	*37.5*	*28.2*	*20.6*	*17.7*	*15.3*	*14.3*	*14.9*	*14.10*	*12.80*	*10.2*
Institutional Investors	*29*	*34.2*	*47.3*	*57.6*	*57.8*	*61.2*	*47.1*	*45.7*	*44.8*	*45.00*	*41.00*	*39.9*
Private Nonfinancials	2.1	2.1	2.3	2.2	2.3	1.6	1.3	1.1	1.2	1.10	0.90	0.8
Public Sector	5.1	5.4	3	5.1	3.8	1.5	2.2	0.8	0.7	0.60	1.80	3
Banks	1.5	2.6	3.6	3	2	1.3	0.1	0.1	0.1	0.10	0.10	1.1
Total	98.7	98.3	99.3	99.7	99.3	99.6	99	97.9	97.8	97.20	96.60	96.5

Source: Office for National Statistics, UK, Updated 09//12/2009.

The later decrease in institutional share holding might be due to the substitution by the rest of the world (foreign investors that are mainly institutional investors), which shows an increase from 7% in 1963 to 40% in 2006. Nevertheless, it is observable that there is an increasing influence of both the domestic and foreign institutional investors on the UK share market. This might indicate that they have changed their investment patterns and choice of portfolios whereby they might have increased their investment in share capital. The reason for the high presence of institutional investors might be partly due to, among other things, the liquid and deep UK stock market that might have encouraged the institutional investors to undertake large investments in shares or to trade in securities avoiding market risks. The ONS show that the institutional investors have more preference to invest in large quoted companies, the FTSE 100 firms, in more liquid capital markets, than in smaller listed firms.

Hence, the important insight form *table 3.1* is that share ownership in the UK has been undergoing institutionalization (Kahn, 2006; Rydqvist et al., 2008). In other words, the historical increase in stakes of institutional owners and the decrease in the shares of individual owners might show the substitution effects between the two investor categories. Regarding this issue, Duggal and Miller (1999) write that institutional investors are rapidly replacing individual investors in the stock market also in the US. It might be the case that individual investors might have been investing via institutional intermediaries rather than directly. Another insight is that the decrease in the institutional ownership might have been due to the substitution effects with the rest of the world. However, as most of the foreign owners are also institutional investors, the proportion of UK equity held by institutional investors can be higher (Franks and Mayer, 1997).

Another important thing to note in the *table* is that equity ownership by the private nonfinancial institutions, public sector and banks remained to be low and volatile over the period. However, the stake of public sector shows decreases whereas that of the banks shows increases since 1980s coinciding with more financial liberalization and huge privatization in the UK. In contrast, the holdings of the nonfinancial firms show overtime decrease.

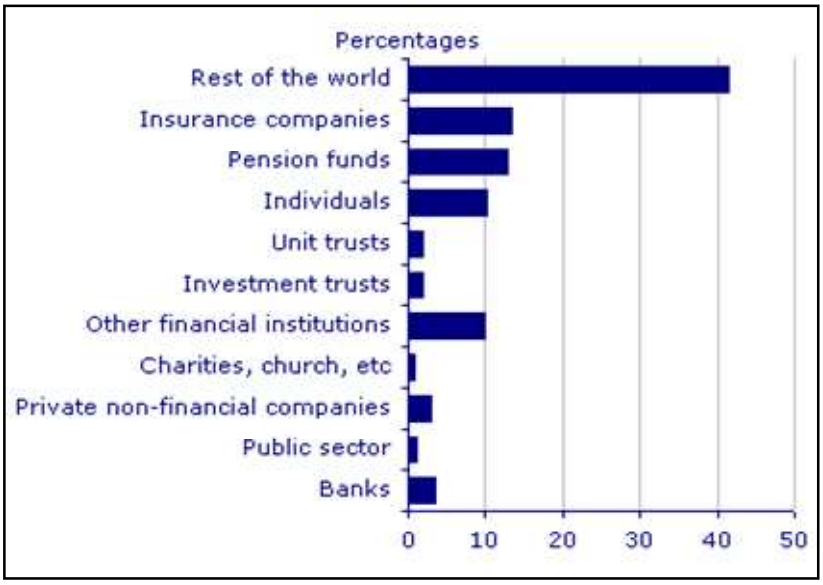
Regarding the period under review and assuming that data values of 2008 closely might be approximate values for the missing data of 2007, private nonfinancials ownership, institutional ownership and Individual/ family ownership show decreases by about 33.33%, 10.94%, and 31.54% respectively over the period between 2003 and 2007. However, bank ownership shows stability at the beginning of the period until it showed a 10% increase at the end of the period. The stake of the public sector shows decreases at the beginning but dramatic increase (about 67%) at the later part

of the period. Foreign ownership shows an increase of about 14.96%, whereas institutional ownership shows decrease by about 10.93% over the period. However, it is arguable that the increase in the bank ownership might have been influenced by government's credit crunch rescues to the banks and the increase in the public sector might have been due to the bailouts to banks by the state in 2008.

From the most recent update of beneficial ownership of UK shares from the UK Office of National Statistics presented as *figure 3.1* it is observable that the holdings of insurance companies and pension funds show decreases to the lowest level since 1975 to 26.20% in 2008, when we exclude other institutional investors like investment trusts, unit trusts, other non-profit institutions like churches and charities. Individual/ family holdings also show decreases to 10.2%, which is the lowest record in history of the survey (ONS, Share Ownership 2008). Foreign ownership (rest of the world) has risen from 40% in 2006 to 41.50% in 2008.

However, the share distribution from the ONS described above does not tell the control structures of the firm and ownership concentration level because they show aggregate figures of all beneficial shareholder categories of the firms. Since many of the shares are not voted on the General Meeting and many of the shares carry very insignificant proportion of the firm's outstanding equity, the assessment of control needs to be related to the cash flow rights that give the incentives and ability to exert control pressures to influence firm value. The ability to exert control pressure by shareholders is thus related to the proportion of block of shares they own (voting rights attached to the shares). Hence, it is vital to review research literature in order to show how researchers identified and reported the shareholders and ownership structures that might enable the owners to exert control pressure.

Fig. 3.1: Beneficial Ownership of UK shares: end-2008.



Source: Office for National Statistics, Share Ownership 2008.

The empirical evidence from Eisenberg (1976), Demsetz and Lehn (1985), and Shleifer and Vishny (1986) show that the largest US firms have the modest concentration of equity ownership, where there are several large or controlling shareholders. For instance, Demsetz and Lehn (1985) show that the largest 5 and 20 blockholders owning 0.2% or more of company's shares own 24.81% and

37.66% respectively of the equity of a sample of 511 US listed firms. Likewise, Shleifer and Vishny (1986) find that the average holding of the largest shareholder owning 5% or more of a firm's equity among the 456 firms of the Fortune 500 is 15.4% and the total average holding of the 5 largest blockholders is 28.8%. Regarding blockholder types, Denis and Denis (1995) report that insider ownership in the US is 11.7%. More extreme, Holderness and Sheehan (1988) show that 13% of all listed firms and 5% of firms traded on the NYSE and AMEX exchanges have a single shareholder (family or another firm) that holds majority of outstanding equity shares.

Regarding the UK firms, the study by Franks et al. (2001) provides evidence (data ownership of 0.1% or more directors' holding for all years, and 5% or more outside blockholding from 1988 to 1989, and 3% from 1990-1993 following statutory disclosure rule change) that the total equity ownership of the first largest blockholder is 15.3% on average for all years, and that the aggregate holdings of the first 5 blockholders control more than 33% outstanding shares on average for the period 1988-1993, ranging between 29.7% and 36.7% of firm's shares depending on the year. The aggregate all large blockholding varies between 30.6%-42.7% of the sample's equity depending on the year. They also report the average insider ownership in the UK is 11.8% and that a single blockholding majority blocks of outstanding shares is 3%. Hence, the evidence shows that the level of ownership concentration in the UK is similar to that of the US, as shown in the studies mentioned above.

Moreover, Marchica and Mura (2005) provide evidence on UK ownership structure for the period of 1991-2001 with two-year intervals for a sample of approximately 1100 nonfinancial listed firms (5425 observations) from London Stock Exchange using the threshold of 5% for 1991 and 3% for 1993-2001 based on the UK disclosure rule. In order to compute the ultimate ownership and control structures, they randomly selected and constructed a sample of about 550 nonfinancial UK listed companies for a period of 1993-2001. As an extension to Franks et al. (2001) study, their result show that insider ownership range from 10.69%-16.54%, and widely held ownership (held below the disclosure rule) accounts on average range from 51.85% to 61.16% during the period. The result shows that while the stakes of directors showed steady decrease, widely held ownership (float) and outsider ownership showed steady increase during the period of 1991-2001. The interesting evidence from the study is that the float showed volatility during the period ranging between 51.85% in 1993 to 56.41% in 2001 for the main sample, and that outsider ownership remained relatively stable during the period. They also report that the largest blockholders an average of between 18.88% in 1993 and 17.76% in 2001, thus showing slight decreases during the period. The average holdings for the first largest blockholders (18.14%) is a bit higher than the result (15.3%) of Franks et al. (2001), and this might, among other things, be due to the difference in the thresholds used. They also find that institutional ownership and bank ownership show decreases, whereas individual/family ownership shows slight increases during the period. Consistent with Ersoy-Bozkuk and Lasfer (2000) they find the decrease of institutional ownership during the period. Finally, bank ownership show decreases, whereas individual/ family stakes slightly exhibits increases in the period under review.

Furthermore, Florackis and Ozkan (2009) provide some evidence on the ownership and control structure of UK listed firms for the period of 1999-2005, and it can serve as an extension to Marchica and Mura (2005) since it provides evidence on UK share ownership patterns for more recent years. They report that the stakes of all blockholders increased from 32.88% (26.93%) in 1999 to 40.86% (32.65%) for 3% and 5% cut-offs respectively in 2005, indicating that ownership concentration shows

increases throughout their period of review. Their result also shows that the proportion of firms with controlling blockholders (at 20% cut-off) increased from 15.68% in 1999 to 19.74% in 2005. They also report significant decline in the executive ownership during the period (from 10.19% in 1999 to 6.79% in 2005) consistent with the result of Marchica and Mura (2005).

Generally, literature show that the market-based governance system in the UK and the US is characterized by more markets' liquidity and less concentrated ownership, relative to the relationship-based systems of Continental Europe and Japan (Frank and Mayer, 1997; La Porta et al., 1999; Ersoy-Bozcuk and Lasfer, 2000; Thomsen et al., 2006). Despite the general similarities between the UK and the US, there are differences in the pattern of share ownership even though they both have *common law* regulatory systems (La Porta et al., 1988). The UK financial institutions, the largest share owners, hold more proportion of the total outstanding shares than their counterparts in the US. Additionally, individuals are reported to hold less equity in the UK compared to their higher stakes in the US. Another characteristic of UK institutional investors is that they are highly concentrated and that they invest most of their assets in equities (Franks et al., 2001; Franks and Mayer, 2002; Faccio and Lasfer, 2000).

Hence, having explored the reports on the states and evolution of corporate ownership and control structures in research literature that are relevant to this study, it is important to identify the owners with significant blocks of shares based on the control potential perspectives. The control potential perspective is a viewpoint that assumes that control power is derived from voting power that is attached to ownership rights. Therefore, the discussion of the rationale behind the identification of blockholder categories and choice threshold levels to measure the categories is vital.

3.2.2 Motivating Factors of Block Ownership

Thomsen and Pedersen (2000) note that the identity of owners (blockholders) is important for corporate strategy and firm performance because their objectives, incentives, the way they exert their influence is manifested in the strategy formulated on profit goals, dividends, capital structure and growth rate. So the identification of the blockholders is important for this research.

In order to identify the blockholders, the important questions would be: *Why do blockholders assemble and hold blocks of shares or diversify their portfolios of stocks? How do we measure and identify the blockholders that have the ability to exert control pressure? What are the identifiable blockholder categories from the perspectives of their characteristic features, investment behaviours, and liquidity?*

The motivating factors behind holding blocks of shares and blockholders are (1) private benefits of control, and (2) shared benefits of control, which are not mutually exclusive (Holderness, 2003). The premise is that some shareholders own blocks of shares in firms in order to attain the ability to exert control for the shared and or private benefits of control. Regarding private benefits of control, Barclay and Holderness (1989) suggest that the benefits are the driving forces of block trades, block premiums and the amassing of block of shares. The private benefits they mention are: (1) the expected stream of dividends, (2) pecuniary benefits like high salaries for individual blockholders by being in the management, and (3) securing enough voting power in order to influence control in anticipated management changes, to decrease the effective control of existing large shareholder, or

to impede an outsider's voting control. The shareholder can attain substantial blocks of shares by assembling of blocks through a series of small open-market transactions and/or purchasing blocks of shares at premiums (Barclay and Holderness, 1989).

Moreover, large owners might have the incentives to amass blocks of shares to exert control and monitor the management for the *shared benefits of control* which accrues the smaller shareholders (Shleifer and Vishny, 1986; Barclay and Holderness, 1989). Holderness (2003, p.54) states that the shared benefits of control arise from superior management or monitoring that can result from the substantial collection of decision rights and wealth effects that come with large block ownership. The cash flow from the profits as the result of managerial decisions and stock price increases that has the wealth effects eventually accrue to minority shareholders. He explains that if the higher cash flows arising from the increase in firm value are shared by minority shareholders, this constitutes the shared benefits of control.

3.2.3 Thresholds to Identify Ownership and Control Structures

In order to measure ownership structures from the control potential perspective, this research uses cut-off level or threshold of control that identifies the existing blockholders and ownership concentration of a firm. In firms with shareholders owning more than 50% of the outstanding shares, control is uncontested and there might be absolute control or majority controller. This can be generalized for firms with highly concentrated ownership structure. However, the share ownership in modern corporations is dispersed and the control configuration might be different. Regarding this, Sorensen (1974) explains that corporate stock ownership appeared to have become more widely diffused since Berle and Means (1932), indicating that it is no more required to hold 50% or more to exert effective control. It is uncommon to have large shareholdings that give absolute control in the UK (less than 1% for blockholder type, 2.9% for all categories considered in Franks et al., 2001). Our data on the UK being used in this research also confirms this. Hence, as share ownership has become more widely diffused, the level of block ownership needed to effectively control firms has fallen down. The other possible explanation for the uncommon majority stake holdings by investors might be the institutionalization of equity ownership, especially in the UK. Mayer (2002) suggests that share ownership is dispersed such that it is not required for investors to hold large equity stakes in order to assemble majority stake in order to exert control pressure.

Hence, considering the continuous overtime increase in dispersion of ownership and the rise in the institutionalization of ownership, the use of control thresholds less than 50%, which gives majority vote to ensure uncontested control, may not nowadays be the criteria to define the control structure of modern large listed firms. So, the interesting research question is how to define the control criteria that enable to identify controlling blockholders. *What threshold level would ensure control in firms with diffuse ownership, like the UK case? Put in another way, how is the configuration corporate control when minority controllers do not exist in a firm?*

For the purpose of this study the use of the UK national disclosure mandatory rule might be appropriate as used by Franks et al. (2001), Marchica and Mura (2005), and Florackis and Ozkan (2009). A 3% criterion is used to collect all blockholders that hold substantial shares in each firm and the proportion of stakes the hold (as percentage of outstanding equity of the firm) in the sample. This is considered to be appropriate because it is the level at which shareholders are typically

required to disclose their stakes (Holderness, 2009) and it would reveal the ownership structure (the distribution of share ownership among owners and the extent of ownership concentration) of firms. As for the UK, the Company Law provides that the individual or group should notify the company (1) any acquired equity stake of at least 3% or more, and (2) any increase or decrease of the stakes if they exceed 1% to the company; and that the company must record in its share register the notified stake as substantial shareholdings (Goergen and Renneboog, 2001). Additionally, the London Stock Exchange provides the listing rule that requires the mandatory disclosure of the firm's ownership with at least 3% of the firm's outstanding shares. Hence, this provides facilities or the bases for identification of blockholders with significant shares and the availability of data to study the ownership of UK firms.

Literature reveals some argument for the lower cut-off level. For instance, Crespi and Renneboog (2003) argue that in spite of diffuse ownership, the UK blockholders might actively monitor firms and reduce the free-riding problem by creating voting coalitions, which are difficult to directly test since their existence is not usually disclosed. Such coalitions exist as *ad hoc* basis for specific aim like the removal of underperforming managers since the coalitions that are formed for longer time are considered to be an investor group bearing all the legal requirements of disclosure, reporting and governance as a large shareholder by regulatory authorities. In the UK a coalition of 15% or more of shares is required to disclose its strategic intent, and a coalition of 30% or more is required to comply with the take-over rule (Goergen and Renneboog, 2001). The formation of the voting coalitions can be from the identifiable significant blockholders owning as low as 3% or more of the firm's outstanding shares. Hence, the blockholders owning 3% or more stakes might have the incentive to form voting coalitions and attain the ability to exert control pressure in their firm.

However, according to literature search, the issue of shareholder voting coalitions has not been empirically investigated. Zwiebel (1995) and Bennedsen and Wolfenzon (2000) developed interesting theoretical models. Applying game theory, Zwiebel (1995), assuming divisible control benefits, provides a model which predicts that (1) large blockholders will create their own space by forming coalition that deter other block investors from control; (2) there is a clientele effect in the shareholder structure, where in the equilibrium consists of (a) firms with one very large blockholder and no smaller blockholders, (b) firms with one large blockholder and many smaller blockholders, and (c) firms with numerous small blockholders but no dominant shareholder; and (3) there will be a threshold size beyond which large investors might not be challenged or contested by others. In the UK, where ownership dispersion is very high, it might be suggestive that the predominant equilibrium states of clientele effect are (c) and (b) type firms. Hence, the assumption of coalition formation in order to control or to contest the dominant might be appropriate. It might be arguable that same-type investors (blockholders' categories) are likely to cooperate or form coalition more easily with each other than different types of block owners.

On the other hand, Bennedsen and Wolfenzon (2000) develop a model of control contest in which an initial owner chooses ownership structure with multiple large blockholders in which a single shareholder is prevented from taking unilateral action that might hurt other shareholders. They argue that the diversion of funds from the firm requires the consent of a coalition of blockholders; and that the coalition of shareholders diverts fewer funds than any individual controller. This might subsequently help the founder manager to maintain control by forming coalitions at the cost of diluting own power. Nevertheless, it might also give rise to the formation of stronger coalition that

would question or contest the position of the founder manager. Even though their model is for closely held corporations, it might be indicative that the formation of coalitions of controlling or contesting is even relevant in firms with highly dispersed ownership structure. Hence, it is arguable that the model of Bennedsen and Wolfenzon (2000) might be extended to the UK case, where share ownership is dispersed and there are several small blockholders that might collude to form coalitions in order to exert control pressure. Accordingly, it might be suggestive that selecting blockholders owning as lower as 3% or more might enhance the voting power of a coalition that might influence the control of the firm in firms with diffuse ownership.

To sum up, given the uncommon large shareholdings in the UK, based on the arguments made above; the arguments for the incentives and ability to exert control pressure and the prospects of the formation of coalitions of blockholders to exert control pressure; in line with the recent studies on the UK by Crespi and Renneboog (2003) and Florackis and Ozkam (2009); in conformity with the regulatory regimes in the UK; and based on the provision of the UK Company Law and the London Stock Exchange listing rules, it would be reasonable to use 3% as a base or recipe for computation of some aggregate blockholder types and ownership concentration measures – blockholder types, ultimate controller types, ownership concentration and blockholder concentration in the methodology section of this study.

3.2.4 Identifiable Blockholder Categories

Based on certain common attributes or characteristics of different shareholder types, Frank and Mayer (1997) classify the category of blockholders from control potential perspective at 25% cut-off level into sectors (1) insurance company, (2) trust /institutional investor, (3) family group, (4) bank, (5) State (local and national level), (6) other companies (nonfinancials), (7) foreign company, and (8) unknown. They take the remainder of the share stakes below 25% cut-off as widely held and treated the institutional investors separately as insurance and trusts. La Porta et al. (1999) presents blockholders as (1) family, (2) State, (3) widely held financials, (4) widely held corporations, and (5) miscellaneous using 20% and 10% cut-off levels. They grouped some important shareholder entities like cooperatives, voting trusts, or a group with no single controlling investors as miscellaneous, and the rest of shares are taken as widely held. Later studies like Claessens et al. (2000), Faccio and Lang (2002) follow the methodology of La Porta et al. (1999).

However, in this study we have condensed blockholders types into (1) family or individual, (2) insiders or management, (3) nonfinancial companies, (4) institutional investors, (5) banks, (6) state based upon some common characteristic features and behaviours of the blockholders. It should be noted that the reported substantial equity owners provided in the Waterlow Stock Exchange Yearbook does not make distinctions between domestic UK owners and foreign owners; hence, foreign owners, most of which are found to be institutional investors and banks, are not treated as separate blockholders but they are included in their respective categories.

The final note is that the ownership data source also provides only a lump-sum of directors' ownership for each firm instead of separate ownership of easily identifiable executives and nonexecutives. Hence the identified 6 categories mentioned above can fall into two groups – insider and outsider investors (*figure 3.1*). Literature shows that the insiders who manage the firm might exploit the shareholders in contrast to the view fiduciary duty of directors, and that certain outside

investors might also have the potential ability to exploit minority investors or gain benefits e.g. from the sale of services in contrast to the monitoring hypothesis that suggests large outside shareholders might play the monitoring role to curb rent extraction by managers.

3.2.4.1 Family or Individual

The consideration of family or individual ownership as a separate blockholder category stems from its prevalence in the control of firms around the world. Empirical sources support the relevance and significance of family as distinct blockholders in corporate share ownership. For instance, in a comparative study that uses 10% threshold, Gadhoum et al. (2005) report that family or individual controls significant proportion (25.27%) of UK corporations. Additionally, Faccio and Lang (2002) find that families control 23.68% of the UK firms in their sample using 20% threshold. Literature shows also that family ownership is common all over the world (Burkart et al., 2003), and that it is dominant among listed firms (La Porta et al, 1999; Claessens et al., 2000; Faccio and Lang, 2002).

We define families or individuals as private households and those related to them that invest as private individual/family or group of partners/families rather than as an institution or organization. Family ownership is usually characterized by (1) low investment diversification, where they put most of their assets in the firm; and (2) high ownership concentration, where they hold large blocks of shares. In our analysis the founders and their heirs or their representatives that might be part of the board are not included as family or individual ownership since they are often in the management.

For the purpose of this study, individuals or families that are directors are not included in this category even though they can be individuals/ families because they have peculiar incentives as being part of the management of the corporation. This is also shaped by the nature of our ownership data source, the Waterlow Stock Exchange Yearbook, where the interest of the insiders in their firm are provided as a separate aggregate holding of all directors and that of families are given separately. Hence, the family or individuals we refer in this work are blockholder categories that are external shareholders.

3.2.4.2 Insiders

We define insiders as shareholders that are part of the management (executives and nonexecutives) that aggregately own blocks of shares above the UK disclosure rule. According to the agency theory the interests of management or directors diverge from that of the outside shareholders where the insiders have the incentives to maximize their own utility rather than maximizing shareholder value. The incentivization to align the diverging interests of the managers and shareholders in the agency perspectives has given insiders (managerial) share ownership extensive attention in corporate finance literature. The *alignment of interest hypothesis* also suggests that firm performance is enhanced as managerial ownership increases (Jensen and Meckling, 1976; Jensen, 1993). In contrast, the *entrenchment hypothesis* suggests that firm value declines as management holds higher share stakes in the firm (Jensen and Meckling, 1976; Stulz, 1988). Hence, it is suggestive that insiders or management (including nonexecutive directors) are identified as a separate block owner's category.

Extensive research work is done in order to investigate the effect of managerial ownership on firm performance (Stulz, 1988; Hermalin and Weisbach, 1988, 1991; Cho, 1998; Bethel et al., 1998) and several researchers have used to compute other block ownerships and managerial ownership

separately (McConnel and Servaes, 1990; Agrawal and Mendekler, 1990; Merhan, 1995; Agrawal and Knoeber, 1996; Loderer and Martin, 1997; Short and Keasey, 1999). Some researchers that have investigated only the patterns of ownership and control structures of listed firms also computed managerial ownership separately in order to find the extent of managerial control position in terms of share ownership (Marchica and Mura, 2005, Holderness, 2009).

Moreover, some studies computed CEO ownership or executive management ownership separately by differentiating them from the nonexecutive directors' interest in the firm (Slovin and Sushka, 1993; Weir et al., 2002; Holderness et al., 1999; Anderson and Reeb, 2003). It is clear that management is responsible for the day-to-day operations of the firm whereas nonexecutive directors are considered as monitors or supervisors of the executives from the agency perspectives. However, sitting in the same board in the one-tier system of the UK might question the supervisory role of the nonexecutive directors. Hence, this research will follow those who aggregate the ownership stake of all directors as *insider or management ownership* and compute it separately. It is to be noted, as already mentioned, that family or individual share owners and their heirs and representatives in the board of directors are included in this blockholders category. Finally, the data source used for ownership, the Waterlow Stock Exchange Yearbook, also facilitates this classification by providing a lump-sum of directors' ownership as substantial stakes. However, this is not the determinant reason since the ownership stake of directors above 0.1% is to be disclosed according to the disclosure rule and the aggregate is disclosed in annual reports of listed firms.

3.2.4.3 Nonfinancial Firms

By nonfinancial firms, we refer to non-regulated industrial companies that exhibit a form of independence in conducting their businesses. Unlike other firms like the regulated financials and utility companies, they are involved in the production and marketing of commercial products and services to customers and it is inconvenient to include them in other relevant blockholder categories.

Literature reveals that nonfinancial firms hold significant proportion of equities in other firms in Continental Europe. Frank and Mayer (1997, 2001) provide evidence that they own 46.7% of French equity shares at 25% cut-off. In Germany, they account for 27.5% of dominant shareholdings as single blockholder owning more than 25% (Franks and Mayer, 2001). For large firms, La Porta et al. (1999) show results that at 20% cut-off level for control, nonfinancial firms own 15% in Argentina, 25% in Australia, 15% in Canada, 10% in Portugal and 10% in Ireland. For the US, Gadhoum et al. (2005) provide results that widely held corporations hold about 2.5% of US equity shares at 20% cut-off level for control. However, the nonfinancial firms own less than 1% in the United Kingdom (ONS). The evidence from Marchica and Mura (2005) on a sample of UK firms also confirms this fact. However, Franks et al. (2001) report that industrial companies are the third major largest blockholders (controlling 13.0% of the listed firms as the largest shareholder) next to institutional investors (52.6%) and families/ individuals (28%) using the mandatory disclosure rule in the UK as threshold.

It can be argued that nonfinancials as significant category of shareholders exist in insider systems, where cross-shareholdings are common. In Japan, the conglomerates are involved in cross-shareholdings and interlocking directorships (Jenkinson and Mayer, 1992). In outsider systems,

where ownership is dispersed among large number of individuals and institutional investors, like the UK and the US, cross-shareholdings are rare (Jenkinson and Mayer, 1992) and hence, the stakes of nonfinancial firms in other firms might be less. On the other hand, it might be argued that nonfinancial companies might own blocks of shares in high growth smaller firms in order to benefit from their firm's profitability or to exert control over suppliers, customers and competitors through, among other things, integration and mergers (Grossman and Hart, 1985).

Additionally, they might have several non-listed subsidiaries, in which they might have higher interests than their usual lower blocks of shares in listed firms. As they are industrial or commercial firms, they have also the incentive to control other firms by investing in the equities of other companies so as to clear the way for vertical or horizontal integration. Finally, it might be argued that they might diversify their portfolio against the market risk and their own nonsystematic risk by spreading their holdings in smaller insignificant stakes across several firms, and this is difficult to trace below the mandatory disclosure level. However, diversification has the cost of reducing the incentives to monitor or control the firms they invest in (Jenkinson and Mayer, 1992). Hence, despite the low level of participation in other firm's equity by the sector, based on the prevalence and importance of nonfinancial firms as equity investors in other firms and their investment behaviour, we classify them as a separate blockholder category.

3.2.4.4 Institutional Investors

Institutional investors are defined as the aggregate of nongovernmental and nonconventional banking institutions like pension funds, insurance companies, trusts, mutual funds and trustees holding blocks of shares in listed companies at or above the disclosure rule level. Institutional investors exhibit common characteristic features that include: (1) risk pooling and diversification, (2) preference of liquidity, (3) the ability to absorb and process information, (4) matched assets and liabilities in terms of maturity, (5) ability to transact in large volumes due to their size, (6) considerable countervailing power from their size, (7) asset management processes (Davis and Steil, 2001).

Nevertheless, the individual institutional investors have some differences and their own peculiarities, which are also vital to consider. Among other things, the main characteristics to consider are the *need for liquidity* and *level of equity holding*. Similar to banks, some institutions like mutual funds, and insurance firms need liquidity because their shareholders, depositors or policyholders can withdraw their funds on short notice and they might not be able to assemble large blocks to take control position in firms they invest (Coffee, 1991). Hence, they generally play the dual role as both principals and as agents with a fiduciary responsibility to their beneficiaries. The fiduciary duties mean that they are conflicted in serving the interests of those roles – owner-shareholders and intermediaries (Ingley and Walt, 2004).

With respect to governance, most fund managers are short-term speculators talking decisions or actions in order to serve the interest of their clients (mostly corporate investment pool firms). In competing for and to attract customers' funds, mutual funds need to be engaged in active trading and assert their ability to outperform their competitors. So mutual funds need high level of liquidity and they are characterized as having short-run and opportunistic goals (Kirby, 1996) rather than participating in governance of their firm in order to solve agency problems. Also similar to banks,

insurance companies are highly regulated investors. Hence, they used to lack the capacity to hold a significant portion of volatile investments like equity securities, especially in the US. However, insurance firms have uniquely lower need for liquidity than mutual funds and banks.

However, there are structural differences between the UK pension funds and its US equivalent. With regard to the UK, the pension funds could be active and substantial shareholders, in contrast to the US pension funds. They tend to be long-term equity holders who do not need the overnight liquidity of the stock markets, because unlike mutual funds and unlike the US practice, UK pension funds do not face shareholder redemptions and nor are they engaged in an active competition for investors' funds (Coffee, 1991). Generally, UK funds heavily invest in long term assets including real estate and foreign stocks. They tend to do their investing via 'in-house staffs' or internal money managers unlike the normal US practice of investing by allocation of the management of their assets among several investment advisers. British funds make up a disproportionate amount of the British financial markets, holding a large block of stock that might tempt to accept a substantial block discount. However, the fact that they tend to limit their holding to a low percentage of each issuer's outstanding stock reflects that they prefer for liquidity over control (Coffee, 1991).

The other feature to consider is the *incentive and effectiveness of monitoring,* which vary among institutional investors (Gillan and Starks, 2003). Pound (1988) argues that institutional investors have the tendency to help entrenched managers by voting with them. Voting with management may be initiated by the current or prospective business relationship the institutional investors have with firms in which they invest (Almazan et al., 2005). Moreover, Brickley et al. (1988) differentiate institutional investors as pressure-sensitive and pressure-insensitive based on business relationship institutional investors have with the firms in which they invest. For the US case, Almazan et al. (2005) provide theoretical and empirical evidence that monitoring influence on executive compensation is associated more with *potentially active institutions* like investment companies and fund managers that are less sensitive to pressure (*pressure-insensitive)* due to lack of business relationship than with *potentially passive institutions* like insurance companies and banks that are more sensitive to pressure (*pressure-insensitive)*. For the UK case, Black and Coffee (1994) argue that there is difference in activism across British institutions; and they conclude that insurance companies are the most active, followed by pension funds, and little interest in activism by mutual funds followed by banks. They argue that British institutions, particularly insurance companies, are more active than their US equivalents.

A characteristics feature to mention about institutional investors is *the ability to absorb and to process information* (Davis and Steil, 2001). They are considered as well-informed investors compared to others and that raises their ability to provide effective and active monitoring besides their voting power. The advantage over information asymmetry makes them to be considered as prudent investors among less-informed investors (Gillan and Starks, 2003; Almazan et al., 2005). So, their action, voice, or sale of their share blocks can be signal for others and that might have impact on firm share price.

Finally, the factor to consider is the *institutional relationships*. UK institutional environment allows collective strategy which is in sharp contrast to the classic Wall Street Rule of exit strategy, where dissatisfied institutions dump their shares into the market and exit. Hence, there is the option to keep on exercising greater 'voice' when the costs of exiting is high and the ability to exit is

diminishing (Coffee, 1991). British institutional investors tend to act collectively through umbrella institutions when dealing with corporate management. Four industry association covering pension funds, insurance companies, unit trusts, and investment companies developed in the UK enables them to share the expenses and political burden of confronting and opposing individual corporate managements. When an emergency situation arises, like a takeover defence, the four associations will form a 'case committee' in order to deal with the corporate management. The Bank of England also plays a behind-the-scene mediating role when tensions arise between dissatisfied institutional investors and corporate managements that appear to have been underperforming (Coffee, 1991).

Table 3.1 shows that institutional investors are the dominant shareholders exhibiting the trend of steady increases and then decreases over time from 1963 to the present. From the control perspective, Franks et al. (2001) show that institutional investors are the first largest shareholders in 52.6% of the UK firms in their sample for the period between 1988-1993 using the mandatory disclosure rules in the UK as threshold. Several other studies like Marchica and Mura (2005), and Florackis and Ozkan (2009) also confirm this for different periods of time. Hence, the significant prevalence of institutional investors as dominant investors in the UK can be one of the reasons for treating them as a separate blockholders category.

The prevalence and the dominant share ownership of institutional investors might indicate that they are potentially capable to exert monitoring pressure even though their reported activism tells a different story. However, recognizing the potentiality of institutional investors in share ownership in the UK and the common characteristics and behaviours they share, this research classifies all of them as a group of owners except the deposit-accepting banks. Even though, literature reveals that some researchers (Franks and Mayer, 1997; Claessens et al., 2000; Faccio and Lang, 2002; Ghadoum et al., 2005) aggregate the institutional investors into fewer entities based on their common features, we follow Claessens et al. (2000), Faccio and Lang (2002) and Ghadoum et al. (2005) and aggregate all financial institutions except banks as a separate blockholders' category.

3.2.4.5 Banks

For the purpose of this research study, banks are defined as those financial institutions in the banking industry that accept deposits and undertake in lending activities. Literature show that UK banks own very low proportion of outstanding shares of companies (*table 2.1*, Franks et al., 2001; Marchica and Mura, 2005; Florackis and Ozkan, 2009). In Continental Europe and Japan banks are allowed to own interests in firms and they have relatively high ownership stakes in them.

The difference in the bank holdings between the UK and the US on one hand and Continental Europe and Japan on the other hand might be explained by the debate on *bank-firm relationship*, which hinge mainly around two extreme outlooks, namely between *market centred systems* of Anglo-Saxon type and German-Japanese *bank centred* systems (Solomon and Solomon, 1999; Franks and Mayor, 2002). Even so, there are those that fall between the two extremes. In the market centred systems banks are relatively unimportant and have arms' length relationship with firms, whereas in bank centred systems banks are allowed to invest directly in nonfinancial firms and many companies are related to a bank through exclusive relationship called *main bank liaison* (Barucci and Mattesini, 2008).

The known function of bank relationship with firms is to provide debt financing and other types of services to firms, including vehicle of transaction, rescuing those in financial difficulties, etc. In the UK, deposit-taking banking firms are also allowed to underwrite and trade securities (La Porta, 1999). Hence, this might be an advantage for banks to be better informed about the creditworthiness of firms and the risks they face when they select the firm from which they purchase equity. However, one of the motives behind acquiring shares of nonfinancial firms by banks can be simple investment in order to have interests that would generate income. Secondly, when banks invest in firm's equity, the relationship is no more creditor-debtor relationship (Coffee, 1991; Barucci and Mattesini, 2008). The bank becomes a shareholder and is able to access additional information in the operations of the firm (asymmetric information advantage) and obtains significant benefits. The bank could detain equities of companies where monitoring costs are large, namely in large companies and firms with good growth opportunities; and this might lead to higher agency costs usually where ownership is less concentrated. Hence, the motive behind acquiring of debtor firm's equities (detaining a relevant stake) and sitting on the board might provide a means to play a monitoring role in order to solve the problem of the separation of ownership and control (Barucci and Mattesini, 2008).

Finally, the third motive might be the desire to influence the management of the firm. This is related to the goal of banks which is different from that of other shareholders. In times of bankruptcy, banks are to be the first to be served a fixed payment for the debt the firm owe the bank from the assets of the firm except where there is a significant loss, whereas shareholders actually capture benefits of investments in good states and they are shielded from loss by the limited liability scheme. So, a bank owning equity in a nonfinancial firm has the incentives to influence the management to undertake more conservative policies directed towards debt repayments. This explains the conflict of interest between debt-holders and shareholders, which is strong where ownership is less concentrated and it becomes critical when banks convert part of their credits to shares (Barucci and Mattesini, 2008).

Mallin et al. (2005) write that banks as lenders to small and medium enterprises (SMEs) in Continental Europe have traditionally played a major role in corporate governance through equity holdings, cross shareholdings and reciprocal board-ship. They argue that UK banks, in contrast, are not major shareholders in nonfinancial firms and traditionally institutional sector, including banks, have been strategic investors that are regarded as 'outsiders' to the firms. In Germany, the roles of banks have been more than lending but also in corporate governance. Since most German shares are unregistered bearer shares and are often deposited with banks for security reasons, the respective holding bank holds the voting rights attached to the shares and inform their vote to their clients. Additionally, unlike the UK case, banks are often elected to the supervisory boards of firms as shareholder representatives in Germany, often chairing the board, and this allows banks to monitor management of companies (Edwards and Nibler, 2000).

However, the gap between the conceptual outlook of market centred systems and bank centred systems are converging significantly stimulated by financial deregulation around the world in 1990s and regulatory legislations like the Second Directive on Banking in the EU in 1993 and the Gramm-Leach-Biley Financial Services Modernization Act of 1999 in the US. The legislations removed several of the restrictions on bank ownership of equity in nonfinancial firms in the US and in many European countries. This opened the way for banks to be involved in the capital of firms (Barucci and Mattesini, 2008). Lee and Mullineaux (2003) argue that the process of convergence between the two

systems is underway. On this issue, Mallin et al. (2005) write that the European-style *universal banking* (that combines commercial and investment banking) and *bancassurrance* (that combines banking and insurance) is developing in the US, whereas the increase in the importance of capital markets driven by privatization and pensions systems that in turn lead to the growth in importance of pension funds, mutual funds, and insurance companies as institutional investors in Continental Europe. Nevertheless, they add that the conflict of interest in investment banking in the US and the UK have challenged the viability of the universal banking style.

The evidence on bank-ownership relationships, which is more limited in literature and mainly concentrated around Germany and Japan, show mixed results. The well established results are from Hoshi et al. (1991), and Weinstein and Yafeh (1998) for Japan and Petersen and Rajan (1994) for US that indicate companies with main bank relationship are less liquidity-constrained. However, and Weinstein and Yafeh (1998) show that firms with a main bank relationship in Japan are characterized by lower profitability, lower growth and higher interest expenses. Moreover, Yafeh and Yosha (2003) show that banks holding a large equity stake in Japan do not limit management private benefits. Consistent with them, Chirinko and Elston (2003) provide evidence for Germany that bank control has statistically insignificant negative effects on firm profitability. Furthermore, Gorton and Schmid (2000) find that firm performance is enhanced from concentrated ownership and in particular from bank influence. It might also be arguable that banks also have an interest in lower risk taking by firms in which they also hold large stakes. This might not only impact on liquidity but also gearing, investment diversification etc. Banks might also be interested in selling services to firms and therefore they have a similar potential conflict of interest with minority shareholders like institutional investors.

To sum up, it is obvious that banks and other financial institutions including institutional investors discussed previously have some features in common. However, since banks have lending and deposit holding functions, liquidity is very crucial for them. They have to be highly liquid to satisfy their customers that might withdraw assets in a short time possible and their investment strategy is based on the need of liquidity in the UK. Additionally, theoretical and empirical evidences suggest that banks have their peculiar means of monitoring firms and they might influence firm performance. Considering these facts, it is decided to treat banks as a category of blockholders.

3.2.4.6 State

By state, in this research, we refer to any national or local government agency. The main characteristic feature of the state as share owner is that it invests or interferes in firm's equity holding using taxpayers or public money. State that owns share blocks in firms may have the incentives related to political objectives such as putting the risk of paying the losses of the firm on the public (La Porta et al., 1999). On the other hand, local governments might hold equity blocks in firms in order to exert control besides their income related private benefits.

Moreover, state plays a role in bailing out distressed private banks or even nationalizes them as seen in the recent crisis in the UK. Nationalization of banks has the benefits of recapitalization to the ailing institution. It might also try to protect depositors from potential losses by limiting or contracting deposits. It is arguable that state ownership of banks provides an indirect means of regulating the conduct of private banks using market instruments rather than administrative-judicial

intervention or law enforcement to curb monopoly and ensure competition. Furthermore, state might intervene in nonfinancial firms' share ownership via the injection of capital by buying shares at prices above their fair values when their share prices fall during crisis in order to the stop further erosion of shareholders wealth. Even though such crises come seldom, it might have impact on the distribution of corporate share ownership for some time.

It might also be argued that states have the incentives to control firms being involved in the share ownership of firms that manufacture strategic military products and services; and a significant block of share ownership in such companies might assure their control. Hence, even though state (government) controls negligible fraction of the UK firms (Gadhoum et al.; 2005; Faccio and Lang, 2002), based upon the arguments on the intervention of the state in listed firms and following some of the researchers, we classify state as a separate ownership category.

To sum up, the discussions and arguments presented in this section lay down the rationale behind the choice of block ownership thresholds that provides metrics for measuring or identifying ownership of blockholder categories and ownership concentration levels. Moreover, the identity of individual shareholders identified is classified into six main blockholder categories based on their similarity in their characteristic features and behaviours.

Hence, using the ownership and control structure variables, which will be discussed in methodology section in details, the study contributes to the research and knowledge gaps whether the degree of block ownership has noticeably changed in the past few years, whether there is a relationship between key features of board of directors structures and ownership patterns, how taking into account different concentration ratios changes the patterns of ownership concentration in UK listed firms.

3.3 METHODOLOGY

3.3.1 Sample and Data

The ownership and directors' data on the UK firms in the FTSE All Share Index covers the period of 2003-2007 so that the recent empirical evidence can be provided. The period chosen corresponds to the time the UK economy recovered from the financial crisis of the millennium up to the start of the recent global corporate scandals and financial crisis that has affected businesses. Hence, the research also helps to view the trends of ownership and control structure and board structure and the trends of the compliance with some recommendations of the corporate governance reforms since the Higgs Report of 2003 and the 2003 Combined Code on Corporate Governance. As it is sought to study the corporate ownership and control structures of the UK listed companies, the FTSE ALL SHARE Index is found to provide a fitting sample because it is the broadest index including smaller and largest listed firms and represents about 98% of the UK market capitalization (FTSE Factsheet, 2008).

The ownership and directors' data are collected manually from the Waterlow Stock Exchange Yearbook. Since the firm year for UK firms is assumed to end 31 March, the data collection is based on the FTSE ALL SHARES in DataStream in April 2008, which is found to give the same lists of active and inactive firms for 2003-2008. For each firm in the Index and for every year, the data is constructed by registering the blockholders owning at least 3% share and their stakes, the number of

nonexecutive directors, board size and CEO-duality. These variables are collected manually for the active firms out of the total 665 FTSE ALL SHARE Index companies. For the period of 2003 to 2007, only those members of the Index whose ownership data is available on the Waterlow Stock Exchange Yearbook are collected. This provides the potential omissions for each year due to missing data. The ownership data on the firms is checked twice during collection in order to avoid significant errors. From the collected raw data, first we identified the blockholder category to which all substantial blockholders in each firm belong.

The final number of companies was determined after omissions. First, the companies in the Index that lack ownership data are removed from the data set. The final database comprises data on 2656 firm years, of which on average 38.37% are financial firms, 29.82% are manufacturing companies, 11.78% are in the consultants sector, 8.13% are Information and Technology Services (ITS) firms, 6.85% are media and entertainment firms, and 5.05% are utility and energy (ENERGY) companies (*table 3.2)*.

Table 3.2: Means of industrial sectors in the pooled sample, at 3% threshold, for the period of 2003-2007

stats	finans	industs	consults	its	media	energy
N	**2656**	**2656**	**2656**	**2656**	**2656**	**2656**
mean	**.3837**	**.2982**	**.1178**	**.0813**	**.0685**	**.0505**

Note: *INDUSTS* is the sector for goods production or manufacturing companies; *CONSULTS* is the sector for providing of consultancy and advisory or supportive services for clients; *MEDIA* is the category that include media, and the intertainments and leisure services; *ITS* is the category for the information technology firms; *ENERGY* is the sector for utility and energy, and *FINANS* is the sector for the financial industry (Institutional investors and banks).

Moreover, as it can be observed from *table 3.3,* the sample comprise of different categories of firms. Firstly, only 16.57% and the remaining 83.43% of the firms in the sample are FTSE100 (FT100) and non-FTSE100 (NOFT100) companies respectively. Secondly, with respect of the exposure to regulation, 43.41% and 56.59% of the firms in the sample are regulated firms (REG) and non-regulated (NOREG) firms respectively. Finally, 38.37% and 61.63% of the firms in the sample are financial (FIN) and non-financial (NONFIN) companies respectively.

Table 3.3: Means of different categories of the firms – FTSE100, Non-FTSE100, Regulated Firms, Non-Regulated firms, Financial firms, Non-Financial firms in the pooled sample, at 3% threshold, for the period of 2003-2007

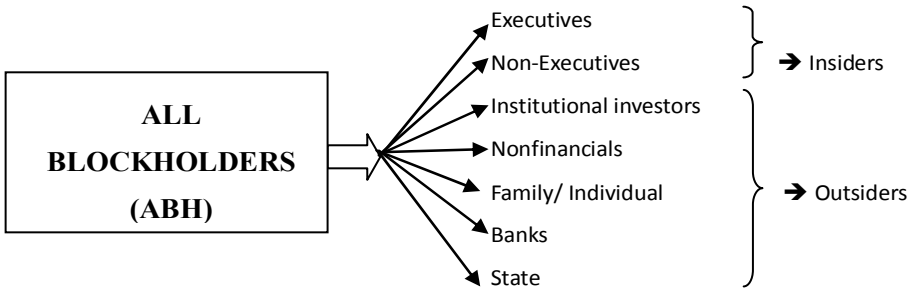
stats	ft100	noft100	reg	noreg	fin	nonfin
N	**2656**	**2656**	**2656**	**2656**	**2656**	**2656**
mean	**.1657**	**.8343**	**.4341**	**.5659**	**.3837**	**.6163**

Note: FT100 is category of firms in FT100 Index; NOFT100 is category of firms not in FT100 Index, REG is category of regulated frims that include financial institutions and utility companies; NOREG is category of nonregulated firms; FIN is category of financial firms (institutional investors and banks); NONFIN is category of nonfinancial firms.

3.3.2 Ownership and Control Structures Variables

Blockholder Categories: For each firm, the aggregate share ownership stake of the relevant blockholder categories are computed from registered significant blockholders. Additionally, the aggregate ownership of all outsider shareholders (OUTO), aggregate of all blockholders' ownership (ABHO), and widely held ownership are computed. All of the significant shareholders in the identifiable aggregate blockholder categories are summarized as (see *figure 3.2* below): (1) insider ownership (executives + non-executives), (2) outsider ownership (institutional investors + nonfinancials + family or individual + banks + government). The outside blockholders would be broken down into (1) institutional investors, (2) nonfinancial firms, (4) banks, and (5) state or government.

Fig. 3.2: Blockholders in terms of agency problems



Source: Own construction.

The share ownership of the blockholder categories mentioned above that are measured in the proportion of aggregate share stakes they hold in a firm's outstanding shares, are also useful in investigating the relationship between ownership structure and firm performance. These ownership variables are defined and explained in *table 3.4 (Panels A and B).*

Ultimate Controller: Despite the complexity of control structure, we make a theoretical assumption that the first largest blockholder type with 3% or more stakes in each firm is the 'ultimate controller' of the firm irrespective of any criterion for control except the mandatory disclosure rule of the UK. By 'ultimate controller' we refer to those blockholder types with the power to influence the decision of the firm by the virtue of having the highest voting power in the firm. Literature suggests that the largest blockholder type plays a role in moderating the conflicts between shareholders and managers (Shleifer and Vishny, 1997; Marchica and Mura, 2005).

Table 3.4: The definition and descriptions of blockholders' categories and ultimate controllers

Symbol	Descriptions and measures
Panel A: Blockholder Categories	
Family/ individual	Household investors.
Insiders	Investors that are directors
Institutional Investors	Investment funds, pension funds, insurance companies (funds), trusts, trustees, universities, foundations, etc.
Nonfinancials	Firms not financial companies and/ or not banking or deposit accepting institutions
Banks	Banks and deposit taking financial institutions
State	State or national and local governments
Panel B: Ownership types/ variables	
INO	Insider ownership; Proportion of aggregate blocks of at least 3% of the firm's outstanding shares held by executives and nonexecutive directors.
INSTO	Institutional ownership; Proportion of aggregate blocks of at least 3% of the firm's outstanding shares held by all institutional investors.
NFO	Nonfinancial firm's ownership; Proportion of aggregate blocks of at least 3% of the firm's outstanding shares held by nonfinancial corporations.
FAMO	Ownership by families or individuals; Proportion of aggregate blocks of at least 3% of the firm's outstanding shares held by family, individuals or related.
BANKO	Proportion of aggregate blocks of at least 3% of the firm's outstanding shares held by banks and deposit taking and credit issuing financial institutions.
GOVO	Proportion of aggregate blocks of at least 3% of the firm's outstanding shares held by state or national or local governments.
OUTO	Outsider ownership, the sum of institutional ownership, Nonfinancial firms' ownership, banks ownership, and state (national or local government) ownership.
ABHO	Proportion of aggregate of block of at least 3% of the firm's outstanding shares held by all blockholders.
WHO	Widely held ownership (= 100% - ABHO)
Panel C: Ultimate Controllers by Blockholders Types	
INC	Control by insiders
INSTC	Control institutional investors
NFC	Control by nonfinancial firms
FAMC	Control by family or individual
BANKC	Control by banks
OUTC	Control by outside blockholders
NONE	No blockholder control

Hence, in order to identify the control power of the ultimate controller type, we use only the voting power of the first largest shareholder type in a firm, not dummies for the presence of controlling blockholders that depend on the criterion for control. It might be arguable that the use a zero-one dummy to measure controlling blockholders is inappropriate because (1) the subjective bias assumes several firms not having blockholders above the threshold as without-controlling-blockholders (Holderness, 2009), and (2) it also ignores the possibility of coalition formations among shareholders and the contestability of control, thus concealing the potential blockholders (Zwiebel, 1995; Bloch and Hege, 2001; Bennedson and Wolfenzon, 2000). Cubbin and Leech (1983) also suggest that the use of zero-one dummy variables is just statistical criterion in terms of a controlling shareholding and they conceal the differences in shareholding dispersion across firms. This is supported by Holderness (2009). Hence, we identify which blockholder category is the first largest blockholder for each firm. The ultimate controller variables identified (*table 3.4, Panel C)* are insiders (INC), institutional investors (INSTC), nonfinancial firms (NFC), family or individual (FAMC), banks (BANKC), all outsiders (OUTC), and no controlling blockholder (NONE) when there is no blockholder in the firm below 3%.

Ownership Concentration: *Table 3.5* presents ownership concentration variables that are identified and used in this research. Even though there are not standard metrics yet to measure ownership concentration, we use the conventional measures such as *concentration ratios, Herfindahl Indices* and *aggregation methods*. The identified variables that measure ownership concentration are C1-CC5, HI3, HI5, ABHO, and WHO as measures of ownership concentration. We would like to note that they are not calculated for the identity of blockholders that are similar, even though it might be easy to form a coalition of those that are in the similar group.

Table 3.5: The symbols and definition or descriptions of ownership concentration variables

Symbol	*Description*
CC1	The first largest blockholder with at least 3% of share stakes.
CC2	The aggregate blocks of shares owned by the first 2 largest blockholders with at least 3% of share stakes.
CC3	The aggregate blocks of shares owned by the first 3 largest blockholders with at least 3% of share stakes.
CC4	The aggregate blocks of shares owned by the first 4 largest blockholders with at least 3% of share stakes.
CC5	The aggregate blocks of shares owned by the first 5 largest blockholders with at least 3% of share stakes.
HI3	Herfindahl Index of the first 3 largest blockholders with at least 3% of share stakes.
HI5	Herfindahl Index of the 5 largest shareholders plus widely held stakes (WHO)
ABHO	Proportion of aggregate of block of at least 3% of the firm's outstanding shares held by all blockholders.
WHO	Widely held ownership (= 100% - ABHO)

Concentration ratio is the aggregate of proportion of shares of a firm concentrated in the hands of a number of blockholders. They are arbitrarily chosen metrics lacking clear benchmarks for decision rule on ownership concentration level. We compute the ratios for the first 2 largest, 3 largest, 4 largest and 5 largest blockholders (CC2, CC3, CC4, and CC5) based on the mergers guidelines in the UK and the US.[3] Even though the concentration ratios show the proportion of firm equity concentrated in the hands of few blockholder, they do not exactly indicate the overall ownership concentration since they omit the rest of significant blockholders and the float or 'ocean' (aggregate stakes of all owners below the cut-off level).

Dahya et al (1998) state that the average number of blockholders in UK firms holding share stake greater than 3% revealed from Company Register analysis 4.5. Even though it might be difficult in the UK listed firms to overtly form a coalition of 5 blockholder due to the mandatory regulatory rule on notifying intentions, we use the concentration of shares in the control of the first 5 largest shareholders (CC5) as a maximum concentration ratio (1) since a contesting coalition might be

[3] (a) Competition Commission (2007): *Merger References: Competition Commission Guidelines*, June 2003 CC2, the UK. (b) Consultation Document, (April 2009): *Merger Assessment Guidelines*, A joint Publication of the Competition Commission and the Office of Fair Trading. U.S. Department of Justice and the Federal Trade Commission (1997): *Horizontal Merger Guidelines,* issued April 1992.

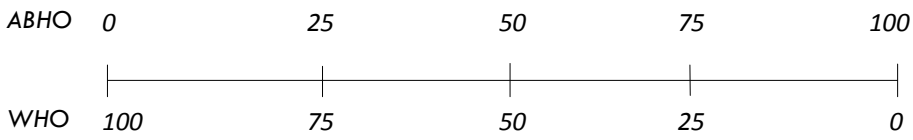
formed against the dominant coalition, (2) based on the data of Dahya et al (1998), and (3) following some other researchers (Demsetz and Lehn, 1985; Leech and Leahy, 1991).

CC1 is considered so that the control potential of the first largest blockholder is identified or analyzed. CC2, CC3, CC4 and CC5 are considered since the first 2-5 largest blockholders might form potential controlling or contesting coalitions. In a way they indicate the proportion of shares concentrated and held by the respective theoretical blockholder coalitions, thus implying that the rest of corporate shares are dispersed among multitude of blockholders and the float.

Herfindahl-Hirschman index (HF) is the measure of concentration computed as a sum of the squares of a number of blockholders. In this study, we compute Herfindahl-Hirschman indices (HF) for the first 3 and 5 largest blockholders (HI3 and HI5) both of which are commonly used for calculating market concentration and industry concentration to deal with mergers. We have chosen HI5 following Demsetz and Lehn (1985), and HI3 following Maury and Pajuste (2005), Franks et al., (2006), and because up to 5 of the blockholders in our data hold high proportion of firm's equity. HI can provide better benchmark to decide on the level of concentration than concentration ratios. It takes into account the relative size and distribution of blockholders of the firms, and increases as the number of blockholders in the firm decreases and as the disparity between the sizes between the blockholders increases. HI approaches zero as the firm consists of a large number of relatively equal sized blockholders. The benchmarks used for market concentration and we adopt is that 1000-1800 points is regarded as *moderately concentrated* and more than 1800 is *concentrated.* By implication HI less than 1000 points is considered to be *dispersed.* Nevertheless, it should be noted that HI might not be robust metrics to measure ownership concentration but just arbitrary arithmetic choices and benchmarks of concentration level based on the major blockholder entities under consideration.

Finally, we argue that the ownership concentration measures that are straightforward and can give better approximation of the level of ownership concentration are aggregate of all blockholders holdings (ABHO), widely held ownership (WHO), and for blockholders concentration is the number of blockholders (NBH). ABHO and WHO might arguably be the most appropriate metrics to-date for measuring ownership concentration because they precisely approximate the extent to which equity shares are held concentrated in few hands. *Figure 3.3* shows ownership concentration measure scales using ABHO and WHO.

Fig. 3.3: Ownership concentration metrics scale, ABHO and WHO in percentages



Source: Own construction to set up benchmark on ownership concentration for this study.

It is assumed that 50% is the midway cut-off for ownership concentration level. ABHO more than 50% or WHO less than 50% is considered as concentrated ownership. 75% and 25% are chosen on the scales arbitrarily because they divide the distance between 50% and the extreme ends equally. We suggest that ABHO of 75% or more and WHO below 25% as *highly concentrated ownership*. In contrast, ABHO less than or equal to 25% and WHO greater than or equal to 75% might be classified

as *highly diffused ownership*. The midways between the two extremes stated here might be classified as *moderately concentrated or diffused ownerships* respectively.

Blockholders Concentration: We argue that the number of blockholders (NBH) is one of the features of blockholders structure that we use as the proper metrics for blockholders concentration since it clearly reveals the identifiable key players in the ownership and control structure. However, it is arguable that it is difficult to set a benchmark for the NBH to reveal the extent of blockholders concentration since it does not indicate the control or voting power of the blockholders. Nevertheless, several mechanisms in which the number of blockholders impact ownership and control structure and firm policies or outcomes might exist. Tribo et al. (2007) suggest that the corporate investment policy is determined by the *number of blockholders (NBHs)* necessary to control the firm besides the type of blockholders.

The NBH, which is a variable that has not been explored enough in previous research, is important since it is not the voting powers that interact but the human dimension that represent the powers in corporate decisions. If coalitions of blockholders are formed, the number of the blockholders in the group would interact in the decision or collective action processes (arguably even irrespective of the voting power). It might be suggestive that more blockholders could signify a higher potential for difficulties in organizing collective action (*disagreement effects*) or less ability to exploit minority shareholders as more blockholders with potentially diverging interests need to cooperate or different groups of blockholders might be able to control each other (*agreement effects*). On the disagreement effects, Tribo et al. (2007) argue that the increases in the number of blockholders within control group negatively affect R&D investment policy. They also add that the existence of a large number of blockholders weakens the level of monitoring of managers' action and behaviour because responsibilities are diluted among a number of dominant large blockholders.

Edmans and Manso (2008) also propose a model of optimal number of blockholders that maximize firm value in the equilibrium. They argue that the optimum NBHs arises from a trade-off between voice and exit, where fewer blocks persist with incentive to intervene but more blocks increase trading to exit. The exit might have the effect of reducing the market value of the firm and the number of blockholders in the firm, whereas persistence of voice might raise the manager's concern for short-term stock prices, and finally result in the optimal number of blockholders that is efficient to maximize firm value, which depends on the relative productivity of the efforts of managers and blockholders. Hence, based upon these arguments NBHs might be regarded as an important measure of blockholders structure or concentration.

Empirically, Cronqvist and Fahlenbrach (2008) provide evidence that the number of blockholders fixed effects as source of blockholder heterogeneity determines firm performance measures and differences in corporate policies. Tribo et al. (2007) provide empirical result showing evidence that the number of blockholders in the controlling coalition is significantly lower for firms that significantly invest in R&D, thus confirming the *disagreement effects* as the number of blockholders in the coalition increases. Hence, based on the theoretical and empirical discussions and the scant empirical evidences above, we propose NBHs is an important blockholder structure variable that can be used to measure the concentration/ dilution of blockholders concentration and that blockholders concentration increases as NBHs will increase; and despite its shortcomings, we can use NBH as a proxy to measure blockholder concentration. Hence, we computed variables related to the number

of blockholders, namely number of all blockholders (NBH), and number of each blockholders' category used in this research (*see table 3.5*) are computed.

Table 3.6: Symbols and descriptions of number of blockholders

Symbol	Descriptions and measures
NINO	Number of insider blockholders with at least 3% of the firm's outstanding shares.
NINSTO	Number of institutional blockholders with at least 3% of the firm's outstanding shares.
NNFO	Number of nonfinancial firms owns blocks of at least 3% of the firm's outstanding shares.
NFAMO	Number of family, individual or related owners with blocks of at least 3% of the firm's outstanding shares held.
NBANKO	Number of banks and deposit taking and credit issuing financial institutions holding blocks of at least 3% of the firm's outstanding shares.
NGOVO	Number of national or local governments holding blocks of at least 3% of the firm's outstanding shares.
NOUTO	Number of outsider owners, the sum of the number of institutional investors, nonfinancial firms, banks and governments holding block of at least 3% of the firm's outstanding shares.
NBH	Number of all blockholders holding block of at least 3% of the firm's outstanding shares.

Board of Directors: The board of directors variables used in this research study as presented in *table 3.7* are: number nonexecutive directors (NED), the proportion of nonexecutive directors (PNED), number of executive directors (ED), board size (BSIZE) and CEO-duality (DUAL).

Table 3.7: Symbols and descriptions of board variables

Symbol	Descriptions and measures
NED	Number of nonexecutive directors
PNED	Proportion of non executive directors
ED	Number of executive directors
BSIZE	Board size; aggregate number of executive and nonexecutive directors.
DUAL	CEO-Duality; takes the value 1 if the CEO sits on the board also as chairman, or 0 otherwise

3.3.3 Analytical Methods

Some of the methodological issues of analyses related to measurements and computations of variables are discussed in *section 3.3.2.* Since this study is just exploratory and descriptive analyses of ownership structure and control structures, we use simple *descriptive statistics* (minimum, maximum, median, mean, third quartile, skewness and kurtosis) outputs of the variables chosen. This identifies the state and trends of the variables.

Moreover, the mean values of the variables for the pooled data are analyzed taking account of the differences in industry or sector, and company categories with respect to size and regulatory exposure. Furthermore, *year-to-year descriptive statics* of the variables are used to investigate the evolution (changes, trends and developments) of the ownership and control variables during the period together with the pooled sample average. *T-test* for the mean difference of independent samples, where year is taken as a categorizing factor, is undertaken in order to investigate whether the changes between the years are significant or not.

3.4. ANALYSES AND RESULTS

3.4.1 The Patterns of Block Ownership

3.4.1.1 Block Ownership in the Period

The descriptive statistics of the five years' pooled samples on block ownership, presented as *table 3.8,* shows evidence that the average share stakes of the firms in the sample that are held by all blockholders (ABHO) is 39.99% and the remaining 60.03% is widely owned at 3% threshold. This implies that even at 3% cut-off level, the UK listed firms have dispersed ownership. It is also indicative that the external blockholders (OUTO) own 36.07% of the shares held by the aggregate of all blockholders (ABHO), whereas the insider ownership (INO) amounts, on average, is about 3.89%. This implies that, on average, the proportion of share stakes held by directors is lower than 4% in the UK firms.

Table 3.8: Descriptive statistics of block ownership structure of the pooled sample, at 3% threshold, for the period of 2003-2007 (percentage of shares)

variable	N	min	p50	mean	p75	max	skewness	kurtosis
ino	2656	0	0	3.885	0	77.99	3.433	15.91
insto	2656	0	26.24	28.94	41.39	99.29	.6716	3.098
nfo	2656	0	0	2.587	0	70.79	4.448	25.23
famo	2656	0	0	1.73	0	97	5.701	47.62
banko	2656	0	0	2.223	3.32	78.48	6.175	67.72
govo	2656	0	0	.1519	0	18.9	8.463	90.61
outo	2656	0	33.59	36.07	49.69	99.91	.4759	2.841
abho	2656	.01	37.84	39.99	54.82	99.91	.3868	2.684
who	2656	.09	62.22	60.03	76.48	98.99	-.3902	2.68

Furthermore, the stakes held by the external blockholders can be broken down into different constituents of the blockholders – institutional investors (INSTO), nonfinancial firms (NFO), family or individual (FAMO), banks (BANKO), and state (GOVO). It can be observed from the table that institutional investors are the major blockholders that own 28.94% of the UK firm shares in the sample at 3% cut-off. Due to their investment behaviour discussed previously, institutional investors might own more than this by spreading their investments in several stock portfolios below the threshold. The result conforms to the other facts reported on the predominance of institutional ownership in the UK. As it is expected, on average, nonfinancial firms, banks, family, and government owns small fractions own 2.59%, 2.22%, 1.73%, and 0.15% respectively of the UK firms in the sample. It is also shown that nonfinancial firms in the UK hold share blocks of less than 3% of the shares of FTSE firms.

Statistically, it is suggestive that the median is less sensitive to extreme values and it measures the midway value of the observations of a sample, and hence it is a better measure of central tendency. The median of INO, NFO, FAMO, BANKO, and GOVO is 0, which is less than their means for the sample, indicating that most of the higher values lie to the left of the distribution, thus confirming their positive skewness statistics. The result shows the median of institutional investors, outsiders, all blockholders, and widely held stakes (WHO) is 24%, 33.6%, 37.84%and 62.22% respectively. They are all less than their corresponding mean value except for WHO, which is negatively skewed, thus indicating that most of the higher values of WHO for the sample lie to the right of the distribution. However, since the mean and median stakes for the different ownership categories are closer to each other, it might be concluded that relying on the mean for the central tendency is an acceptable procedure.

It is interesting to find that the maximum holding among institutional investors is 99.29%. This might not be surprising because the category can be the aggregate holding of a number of institutional investors that are the major share owners in the UK listed firms. The maximum block held next to institutional investors is family ownership, which is 97%. Additionally, the maximum bank ownership and ownership by nonfinancial firms for the period are found to be 78.48% and 70.79% respectively. On average, families or individuals, banks and government owns quite low proportion of the firms' shares in the sample. Moreover, as it is expected, state (national or local government) owns quite insignificant proportion of UK firms and their maximum share block is the lowest, 18.90%.

Table 3.9 presents the state of ownership structure variables accounting for the differences in industry sectors. Insider owners have the highest share holding in the ITS sector and the lowest holdings in the financial institutions. In aggregate, outsider blockholders categories own less share stakes of the energy sector shares than the rest of the sectors and the highest holding in consultant firms. The share holding of institutional investors in the different sectors is around the mean of the pool sample even though their highest share holding is in ITS firms, and they own the highest stakes in all sectors. The nonfinancial firms and banks own their highest holding, which deviates a lot from the mean of the sample, in media and entertainment (MEDIA) sector. The highest holding of family or individual owners is in industrial (manufacturing) sector. State that own less than 1% in other sectors do not own any shares in media and entertaining (MEDIA) and energy sectors. Finally, there is higher ownership dispersion in financial institutions and energy sector than the rest of the sectors, and media and entertainment sector exhibits higher ownership concentration than the rest of the sectors.

Table 3.9: Mean of block ownership structure variables accounting for difference in industry sectors, pool sample of 2003-2007

Variable	INDUSTS	CONSULTS	MEDIA	ITS	ENERGY	FINANS	POOL
ino	5.12	2.94	3.72	6.08	5.86	2.52	3.89
insto	28.10	32.26	29.51	31.60	25.13	28.38	28.94
nfo	2.99	2.46	6.24	1.71	3.37	1.76	2.59
famo	2.31	0.97	1.71	1.22	0.94	1.73	1.73
banko	2.02	2.15	3.23	1.59	1.89	2.41	2.22
govo	0.12	0.03	0.00	0.18	0.00	0.26	0.15
outo	36.03	38.18	41.79	36.78	31.58	34.89	36.07
abho	41.12	41.19	45.82	42.89	37.46	37.44	39.99
who	58.87	58.87	54.41	57.11	62.53	62.55	60.03
N	792	312	177	216	134	1019	2656

Note: *INDUSTS* is the sector for goods production or manufacturing companies; *CONSULTS* is the sector for providing of consultancy and advisory or supportive services for clients; *MEDIA* is the category that include media, and the intertainments and leisure services; *ITS* is the category for the information technology firms; *ENERGY* is the sector for utility and energy, and *FINANS* is the sector for the financial industry (Institutional investors and banks).

Finally, *table 3.10* presents the the state of blockholder ownership structure accounting for the differences in size and the regulatory effects on firms for the pooled sample during the whole period under review. The results show generally that (1) insiders hold more shares in non-FTSE100, nonregulated, and nonfinancials than in FTSE100, regulated and financial firms; (2) institutional investors hold less proportion of outstanding shares of FTSE100 than the rest of the categories, in which they hold almost the proportion that is almost around the mean of the pool (28.94%); (3) nonfinancial companies (NFO) hold higher proportion of shares in nonregulated firms and nonfinancial or industrial firms, and this might imply that the prefer nonregulated companies than the regulated firms; (4) family or individual owners are indifferent regarding the regulatory effects on firms and they hold higher shares in smaller firms than in very large firms (FTSE100); and (5) bank ownership is around the average of the pooled sample for all considered categories. So, the resulst indicate interesting evidence of investment behaviour and ownership pattern of different categories of blockholder categories for the UK listed firms in the sample.

Table 3.10: Mean of block ownership structure variables accounting for difference in size and the regulatory effects on firms, for a pool sample during 2003-2007

VARIABLE	FT100	NOFT100	REG	NOREG	FIN	NONFIN	POOL
ino	1.83	4.29	2.91	4.63	2.53	4.73	3.89
insto	21.10	30.49	28.00	29.65	28.38	29.28	28.94
nfo	2.02	2.70	1.95	3.08	1.76	3.10	2.59
famo	0.86	1.90	1.64	1.80	1.73	1.73	1.73
banko	2.16	2.24	2.35	2.13	2.41	2.11	2.22
govo	0.00	0.18	0.23	0.09	0.26	0.09	0.15
outo	26.55	37.96	34.51	37.27	34.89	36.81	36.07
abho	28.40	42.29	37.44	41.95	37.44	41.58	39.99
who	71.59	57.73	62.55	58.09	62.55	58.45	60.03

Note: *FT100* is category of FTSE100 firms Index; *NOFT100* is category for firms that are not in FTSE100 Index; *REG* is category of regulated firms (financial institutions and energy or utility sectors); *NOREG* is Category of nonregulated firms; *FIN* is category of financial firms (institutional investors and banks); and NONFIN is category of firms that are not financials.

3.4.1.2 Evolution of Block Ownership

Table 3.11 presents the evolution of the means of block ownership during the period of the study. It enables comparison between year's average and the average of the pooled sample and the t-test statistics for mean difference between the years under review. It can be observed from the *table* that the ownership by institutional investors (INSTO) shows steady increases up to 2005 and then decline in 2006 followed by a sharp rise of 28.35% in 2007. However, the result shows that share holding of nonfinancial firms (NFO), family (FAMO), banks (BANKO) and GOVO exhibit volatility during the period.

Table 3.11: Evolution of the average block ownership of the UK listed firms, at 3% threshold, for the period of 2003-2007 and t-test for the mean difference between years

	2003		2004		2005		2006		2007	POOL
variable	mean	t	mean	t	mean	t	mean	t	mean	Mean
ino	4.02	0.1115	3.946	0.9861	3.337	- 1.4178	4.126	0.2398	3.983	3.885
insto	26.46	- 1.2012	27.9	- 1.1143	29.22	2.2459* * *	26.56	- 6.4396* * *	34.09	28.94
nfo	1.944	0.2619	1.826	- 0.2592	1.942	- 6.4807* * *	5.848	8.5250* * *	1.163	2.587
famo	2.051	0.7325	1.746	- 0.4958	1.954	1.9733* *	1.233	- 1.5741* (a)	1.727	1.73
banko	2.061	- 1.1498	2.408	- 1.2654	2.806	5.5882* * *	0.9125	- 6.2456* * *	2.964	2.223
govo	0.1603	- 0.0846	0.1656	0.1413	0.1563	0.4552	0.1281	- 0.3844	0.1523	0.1519
outo	32.83	- 0.8471	33.92	- 1.7051*	36.07	- 0.4689	36.66	- 2.8859* * *	40.18	36.07
abho	36.89	- 0.7713	37.98	- 1.1092	39.5	- 0.9738	40.8	- 2.4917* * *	44.08	39.99
who	63.11	0.7037	62.11	1.1774	60.5	0.9674	59.21	2.5108* * *	55.91	60.03
N	489		503		528		567		569	2656

* , * * and * * * Indicate significance at 10%, 5% and 1% level respectively. * (a) significant at 11.57%

The result also shows that the share stakes held by non-financial firms (NFO) rose abruptly (212%) between 2005 and 2006 and dropped sharply (80,11%) between 2006 and 2007, while the holding of the directors (INO) shows a sharp rise by 23.64% between 2005 and 2006 and a slight drop (3.47%) between 2006 and 2007. The decrease in the holdings of INO and NFO between 2006 and 2007 might be related to the current financial and/ economic crises. Hence, it might be argued that insiders (INO) and nonfinancial firms (NFO) might have sold their shares for capital gain and invested in other low risk assets foreseeing the oncoming trends in the economy between 2006 and 2007. This might also indicate that the insiders that manage nonfinancial firms might be as informed as the inside owners of the firm in which they invest or that they might have close relationship with INO in the firms they invest in.

However, the *table* shows that the aggregate stakes of outside owner categories like INSTO, BANKO, FAMO and GOVO show decreases between 2005 and 2006, and increases between 2006 and 2007. The decreases in their holdings between 2005 and 2006 might be substituted by the rise in the ownership of insiders (INO) and non-financial firms (NFO) in the period. This might imply the potential increase in the incentives and ability for control of the firm by INO and NFO between 2005 and 2006. On the other hand, the increases in the stakes of outsider owners categories (INSTO, BANKO, FAMO, and GOVO) between 2006 and 2007 might suggest that the outsider blockholder categories have increased their share holding due to overconfidence and optimism from the positive developments and health in the economy in the initial periods of the time under review.

Additionally, the increases in the outsider ownership categories might imply that their incentive and ability for control of the firm has increased at the end of the period under review.

However, the result indicates that blockholder ownership (ABHO) has steadily increased during the period from 36.89% in 2003 to 44.08% in 2007. Similarly, outside ownership (OUTO) also showed steady increases during the period. This indicates that the blockholders bought more shares and increased their stakes. In contrast and as it is expected, ownership dispersion or the percentage of shares held widely steadily decreased in the period from 63.11% in 2003 to 55.91% in 2007. Despite the use of low control threshold, which is expected to reveal more blockholders in terms of number, the study provides an interesting evidence of high ownership dispersion in the UK public firms. Additionally, the data of half a decade shows evidence of the process of more institutionalization of ownership (INSTO) during the period, namely a rise from 26.46% in 2003 to 34.09% in 2007. This is in contrast to the data of ONS presented in *table 3.1,* which shows the tendency of decreases in INSTO. The evidence of the increase in the holdings of INSTO can be due to, among other things, the aggregation of foreign institutional owners with the UK institutional investors.

The results on the trends of ownership confirm the evidence of changes in stock ownership of some blockholders reported in the recent studies. Florackis and Ozkan (2009) report that non-executive directors hold 3.5% at 5% disclosure rule in the period of 1999 to 2005, and that executive ownership during the period decreased from 10.9% in 1999 to 6.79% in 2007 for their sample of firms. According to Marchica and Mura (2005) also executive ownership shows decreases from 11.35% in 1993 to 7.57% in 2001, and the overall board ownership (INO) decreased from 13.68% in 1993 to 10.69% in 2001 at 3% cut-off. The result of this study is also in line with the general trend of the volatility of family or individual ownership (FAMO) and the trend of institutional ownership (INSTO) reported by the ONS presented as *table 3.1.* Despite the differences in some trends, it might be suggestive that the results on our sample reflect some of the features (trends and evolutions) of share ownership from ONS data, which can be a population of all UK equities.

As it can be noted from *table 3.11,* there is significant change between 2005 and 2006 and also between 2006 and 2007 in terms of trends of block ownerships. The t-tests for mean difference between 2002 and 2004 and also between 2004 and 2005 (except for OUTO) by assuming non-equal variances show result that the changes are *insignificant* for all blockholder types. However, there is strong evidence that changes in ownership pattern between 2005 and 2006 are found to be significant for the major outsider blockholder types (INSTO, NFO, FAMO, and BANKO), and they remained *significant* for the period between 2006 and 2007. Additionally, there is strong evidence that the changes in OUTO, ABHO, and WHO also show *significance* between the same periods.

The rationale for the systematic significant changes between 2005 and 2006 as well as 2006 and 2007 described above might be explained as follows. Firstly, it might imply that the healthy economic condition in the early years of the period under review might have created confidence in outsider ownership categories (except NFO between 2006 and 2007, and GOVO) to exhibit significant change in ownership between 2005 and 2007. The evidence suggests that there might be more monitoring by the outsider blockholder categories on the management, and this might mitigate the agency problem and reduce rent extraction, which in return might enhance firm performance. Secondly, the recent development in corporate governance of the UK, namely, the Higgs Report and the provision of the Combined Code in 2003 that recommended some changes in

the corporate board structure might influence the behaviour of investors to be manifested significantly between 2005 and 2007. It might be the case that firms were implementing the Code's board structure recommendations and that the insiders and nonfinancial firms might have been sceptical in taking more risk by buying more shares in order to increase their stake in the initial period under review. Later, the INO and NFO might have generally increased their stakes between 2005 and 2006 taking risk related to the compliance to the Code being sure that the change in board composition would not make any difference in the decision making function and process. And especially, since the board of directors deciding on the investment of the non-financial firms are also insiders who have the inside information regarding their firms, they could make informed decision to decrease their stakes steadily until 2005.

On the other hand, unlike the inside owners, banks (BANKO), the public sector (GOVO) and institutional investors (INSTO) might have increased their stakes in the initial phase of the period expecting that the reform in the corporate governance system provided in the Combined Code might improve firm performance. However, the trend of family/ individual ownership (FAMO) that shows volatility over the period is difficult to explain. It might be the case that they might raise or reduce their holdings in firms so that they might diversify their portfolio or invest in other more profitable assets depending upon the opportunities arising.

Moreover, it can be seen that the lowest proportion of the stakes of the firms in the sample that was widely held in the period is 55.91% (in 2007), and thus, the stake that is closely held (ABHO) is 44.08%. The result also shows that the stake of the different blockholder types except INO and NFO show increases in 2007 after experiencing the decline in 2006. This might imply that all blockholder types except the insider owners (INO) and non-financial firms (NFO) increased their share ownership by buying more shares, thus increasing the concentration of ownership (ABHO) and decreasing percentage of shares blocks widely held (WHO).

The interesting question that can be posed here is: *why are insider owners (INO) and non-financial firms (NFO) so reluctant to buy more shares and to increase their stakes between 2006 and 2007?* The reason might be explained in relation to the recent global economic crises, which started in July 2007 with the loss of confidence by investors in the value of the securitized mortgaged in the United States resulting in liquidity crisis. The spill-over effect which started with a visible problem of the Northern Rock in the UK could have been a warning signal for those in custody of insider information. Insiders that are owners of their firms (INO) and the directors of non-financial firms (INO) that have inside and better information than outsiders are well equipped than other investors or outsiders to make expectations of the future financial or economic crisis and might have reduced their stakes beforehand rather than waiting for the decline of stock prices.

Table 3.12 presents the trends and evolution of the pattern of the block ownership structure that accounts for the heterogeneity across different relevant categories of firms with respect to size and the regulatory effects on firms. The results of the yearly averages of ownership of different ownership categories generally indicate that the investor categories change their share holdings in firms across years even though the magnitudes of change are small or big for different investor categories. It is generally indicative that the ownership pattern of different blockholder categories shows volatility across the years. Besides, the result on the average share holdings of different

investor categories generally confirms the state of block ownership previously discussed in *subsection 3.4.1.1* based on the results in *table 3.10.*

Table 3.12: Evolutionary pattern of the average of block ownership of the UK listed firms accounting for difference in size, and regulatory effects on firms, at 3% threshold, pool sample of 2003-2007

YEAR	2003		2004		2005		2006		2007		POOL	
Panel A: Categories of Firms in FTSE100 and Non-FTSE100												
Category	FT100	NOFT100	FT100	NOFT100	FT100	NOFT100	FT100	NOFT100	FT100	NOFT100	FT100	NOFT100
ino	0.91	4.65	1.59	4.43	1.43	3.73	2.21	4.49	2.89	4.20	1.83	4.293
insto	19.32	27.90	21.16	29.27	22.28	30.64	17.16	28.34	25.28	35.81	21.10	30.49
nfo	1.09	2.12	1.01	1.99	1.20	2.10	5.74	5.87	0.98	1.20	2.02	2.699
famo	1.11	2.24	1.15	1.87	1.01	2.15	0.63	1.35	0.47	1.97	0.86	1.902
banko	2.16	2.04	1.65	2.56	3.13	2.74	1.39	0.82	2.46	3.06	2.16	2.235
govo	0.00	0.19	0.00	0.20	0.00	0.19	0.00	0.15	0.00	0.18	0.00	0.1821
outo	23.68	34.67	24.99	35.74	27.61	37.81	26.85	38.51	29.19	42.33	26.55	37.96
abho	24.68	39.35	26.57	40.30	29.05	41.64	29.06	43.02	32.08	46.42	28.40	42.29
who	75.32	60.65	73.41	59.82	70.91	58.36	70.93	57.00	67.92	53.57	71.59	57.73
Panel B: Categories of Regulated and Nonregulated Companies												
YEAR	2003		2004		2005		2006		2007		POOL	
Category	REG	NOREG	REG	NOREG	REG	NOREG	REG	NOREG	REG	NOREG	REG	NOREG
ino	2.81	4.91	2.86	4.76	2.63	3.89	3.33	4.75	2.88	4.84	2.91	4.63
insto	26.46	26.46	26.91	28.64	28.96	29.41	23.92	28.64	33.42	34.60	28.00	29.65
nfo	1.14	2.54	1.14	2.35	0.78	2.86	6.00	5.73	0.37	1.78	1.95	3.08
famo	1.93	2.14	1.61	1.85	1.93	1.97	1.31	1.18	1.49	1.92	1.64	1.80
banko	2.03	2.08	2.56	2.30	2.98	2.67	1.40	0.53	2.80	3.09	2.35	2.13
govo	0.30	0.06	0.28	0.08	0.24	0.09	0.16	0.10	0.18	0.13	0.23	0.09
outo	32.19	33.30	32.20	35.22	34.88	37.00	34.35	38.46	38.25	41.68	34.51	37.27
abho	35.05	38.24	35.06	40.18	37.56	41.01	37.69	43.24	41.13	46.37	37.44	41.95
who	64.95	61.76	64.92	60.00	62.46	58.97	62.30	56.79	58.85	53.62	62.55	58.09
Panel C: Categories of Financial instututions and nonfinancial companies												
YEAR	2003		2004		2005		2006		2007		Total	
Category	FIN	NONFIN	FIN	NONFIN	FIN	NONFIN	FIN	NONFIN	FIN	NONFIN	FIN	NONFIN
ino	2.51	4.93	2.50	4.83	2.06	4.14	3.06	4.81	2.45	4.95	2.53	4.73
insto	26.81	26.25	27.10	28.39	29.52	29.02	24.21	28.05	33.92	34.19	28.38	29.28
nfo	0.82	2.62	0.80	2.46	0.60	2.79	5.93	5.80	0.29	1.72	1.76	3.10
famo	2.05	2.05	1.63	1.82	2.03	1.91	1.41	1.12	1.61	1.80	1.73	1.73
banko	1.92	2.15	2.70	2.23	2.98	2.70	1.54	0.52	2.91	3.00	2.41	2.11
govo	0.34	0.05	0.31	0.07	0.27	0.08	0.19	0.09	0.20	0.12	0.26	0.09
outo	32.30	33.15	32.20	34.98	35.40	36.49	34.89	37.78	38.93	40.97	34.89	36.81
abho	34.86	38.11	34.70	39.99	37.52	40.74	37.95	42.61	41.39	45.77	37.44	41.58
who	65.14	61.89	65.28	60.18	62.50	59.24	62.04	57.41	58.60	54.22	62.55	58.45

Note: *FT100* is category of FTSE100 firms Index; *NOFT100* is category for firms that are not in FTSE100 Index; *REG* is category of regulated firms (financial institutions and energy or utility sectors); *NOREG* is Category of nonregulated firms; *FIN* is category of financial firms (institutional investors and banks); and NONFIN is category of firms that are not financials.

From *Panel A* of *table 3.12,* it is observable that insider ownership (INO) in the FTSE100 firms has been increasing up to the end of the period, whereas it showed decreasing trend in non-FTSE100 firms up to 2005, after which INO showed volatility. The comparison of this with the decreasing trend of INO of the pooled sample shown in *table 3.11* might suggest that insider investors might have been pulling their stakes in non-FTSE100 and pooling it into FTSE100 firms. The opposite trends of external block ownership (overall increases in non-FTSE100 firms and increasing in FTSE100 firms up to the end of the period) might imply that there might be substitution effect between insider

ownership and outsider ownership. This seems more convincing when we view (1) the increasing trend of the ownership of institutional investors (INSTO), which are the major external investors, in non-FTSE100 firms that countered the decreasing trend of insider ownership in non-FTSE100 firms, and (2) the decreasing trend of INO and the opposite increasing trend of INSTO (also BANKO) in non-FTSE100 firms up to 2005, after which both exhibited volatility.

However, the result of the sub-samples (categories) show that family ownership, bank ownership and government ownership experienced volatility and that INSTO showed trend of increases similar to the results on the pooled sample previously discussed (*table 3.11*). Furthermore, the decreasing trend of INO and the increasing trends of INSTO, NFO, and BANKO up to 2005 and the volatility thereafter might confirm the evidence of significant changes in the ownership pattern between 2005 and 2007 evidenced previously from *table 3.11*.

Panels B and C of table 3.12 present the trends or evolution of block ownership of the firms of the sample categorized into (1) regulated (REG) and non-regulated (NOREG) companies, and (2) financials (FIN) and nonfinancials (NONFIN) firms. The results show that inside ownership in both pairs of firm categories had been volatile in the period exhibiting high increases in 2006. The same trend is also exhibited by the ownership of nonfinancial companies (NFO) except that high increase is observed in both categories only in 2006. Hence, the results might confirm that INO and NFO might follow each other or that they have the same investment decision or strategy, and hence, the same characteristic features as shown previously.

The outsider ownership (OUTO) has shown a trend of increases in REG and FIN (except high decrease in 2006 for REG and in 2004 for FIN) and in NOREG and NONFIN companies; and the increases are higher in NOREG firms than in REG firms. The results on the components of the outsider ownership that (1) INSTO and BANKO have shown exactly the same trend of general increase as outsider ownership; (2) INSTO, FAMO and BANKO exhibited high decreases in 2006 in both firm categories; (3) FAMO has been volatile for both firm categories during the period; (4) GOVO has shown general decrease in regulated and financial firm categories during the period (except in 2007 for regulated firms) and increases in non-regulated and non-financial firm categories; and (5) government or state own more shares in regulated and financial firms than in non-regulated and nonfinancial firms. Finally, it might be arguable that the volatility and the high increase of INO and NFO in 2006 (also in 2007 for INO) and the high decrease in INSTO, FAMO and BANKO in 2006 for both firm categories might confirm the significant changes in ownership structure between 2005 and 2007 previously discussed on the results of the pooled sample.

To sum up, firstly, the results show the detailed and peculiar investment behaviour of different blockholder categories regarding the type of firms they invest in. Secondly, the results also presents results that that confirms the general evidence on the pooled sample previously discussed, namely, (1) similar behaviour or characteristics of INO and NFO; (2) similar characteristics of the components of external blockholder category (especially INSTO, FAMO, BANKO); and (3) the significant changes in ownership structure patterns between 2005 and 2007.

3.4.2 Ownership Concentration

3.4.2.1 Ownership Concentration Level

Table 3.13 presents the descriptive statistics of ownership control and concentration variables for the pooled sample of the firms. The aggregate stakes of the first, second, third, fourth and fifth largest blockholder (C1-C5) hold, on average, 15.93%, 8.01%, 5.16%, 3.66%, and 2.55% of the equity of firms in the sample respectively. This implies that the first largest blockholders in the sample control about 16% of all equities of the firms in the sample and that the second largest blockholders of the sample control about half of that of the first largest blockholders. The result shows that the aggregate ownership of the first 5 largest blockholders is 35.31% of all shares outstanding of the listed firms. This implies that the first largest blockholders of the UK listed firms cannot attain absolute or majority control power. The same is true for the lower concentration ratios.

Table 3.13: Descriptive statistics of ownership concentration of the pooled sample, at 3% threshold, for the period of 2003-2007

variable	N	p50	mean	sd	skewness	kurtosis
c1	2656	12.07	15.93	13.02	1.972	7.477
c2	2656	6.93	8.006	5.497	1.953	10.09
c3	2656	4.92	5.16	3.404	1.025	6.36
c4	2656	3.92	3.661	2.729	.5436	4.873
c5	2656	3.16	2.547	2.388	.3607	2.533
cc2	2656	20	23.94	16.04	1.399	5.076
cc3	2656	25.16	29.1	17.54	1.078	4.25
cc4	2656	29.6	32.76	18.58	.8386	3.801
cc5	2656	32.86	35.31	19.44	.6479	3.447
hi3	2656	254.8	688.8	1218	3.53	17.46
hi5	2656	289.3	721.9	1220	3.487	17.19
abho	2656	37.84	39.99	22.25	.3868	2.684
who	2656	62.22	60.03	22.25	-.3902	2.68

On the other hand, the median ownership of the first largest blockholder and the first five largest blockholders are 12.07% and 32.86% respectively, implying that most of the observations are to the left of the mean value. However, the median of C4 and C5 are less than their mean value. This might imply that they have some extreme values on the left tail of the distribution and that does not affect approximation to normal distribution.

Moreover, the median and the mean of equity controlled in the hands of the first largest blockholder (C1) are almost double of the stakes held by the first largest blockholders (C1). However, the median stakes held by the second, third, fourth and fifth largest blockholders vary from 3.16% to 6.93%, indicating that the difference between their median holdings are not very great. Hence, the indication is that the first blockholders (C1) have dominance position than others in terms of equity ownership in the sample during the period under review.

Regarding the concentration ratios, the result shows that the average equity of firms owned by the first two, three, four and five blockholders (CC2-CC5) are 23.94%, 29.1%, 32.76% and 35.31% respectively. These are their voting powers concentration if we assume that there might be coalitions of blockholders. Considering the scenario in which the first 5 largest blockholders (CC5) form a coalition for control the concentration of equity ownership in their hands (35.31%) is lower than 50%, thus indicating dispersed ownership and that control in the UK listed firms is contested.

As for the data on aggregate ownership of all blockholders (ABHO) and widely held ownership (WHO), the result shows that all blockholders with substantial stakes (ABHO) hold, on average, 39.99% of the firms' outstanding shares, which is only 4.68% higher than the holdings of CC5 (35.31%). As shown in *table 3.11 and 3.13* the equity shares concentrated in the hands of insiders ABHO is 3.89% while that outsiders is 36.07%. The indication is that all of the available significant blockholders in the sample aggregated together (40% on average) do not attain majority control (above 50%) in the firm in terms of the voting rights that emanate from the ownership rights. This might in turn confirm that the UK listed firms have dispersed ownership. Moreover, the result indicates that the remaining 60.03% of equities of firms in the sample are widely held. Hence, using our yardstick for ownership concentration in *figure 3.3*, we can suggest that the share ownership of the UK listed firms in the sample is *moderately diffused* (between 50% and 75% for WHO or 25% and 50% for ABHO).

Finally, ownership concentration measured in Herfindahl indices show, on average, that HI3 and HI5 are 688.8 and 721.9 points respectively. Since the points are less than 1000, which is below the lower limit for *moderate concentration* according to the benchmark set in the Merger References[4] of the Competition Commission of the UK and the Merger Guidance[5] of the US for market or industry concentration level. Hence, this result also confirms the UK listed firms' equity is *diffused* or *dispersed*. The median of the Herfindahl Index of the first 3 and 5 blockholders (254.8 and 289.3 points respectively) are lower than their mean values and their skewness statistics show that they are right skewed. This implies that the higher values of the index lie to the left of the distribution, and the ownership of the firms in the sample is *widely dispersed*. The results of the average and median of the HI are in conformity with the results of the concentration ratios. However, it is difficult to theoretically fit it in corporate governance, except using it because HI is the most commonly used concentration measure. Nevertheless, it might not be possible to ascertain that the mergers guidance on competition for goods and services are really good and robust measures that provide good benchmark for shareholder ownership concentration.

The only comparable empirical study showing evidence of ownership concentration, measured as the aggregate ownership of all investors (ABHO) excluding managers owning greater than 3% during the time period under review is from Florackis and Ozkan (2009). Their measurement differs from ours in that our study includes management (insider) ownership in ABHO. They report that the average ownership concentration, measured as the aggregate stakes of all blockholders excluding insiders (OUTO), is 35.79% for the period between 1999 and 2005. When we compute the averages in relation to our time period their average turns out to be 38.15%, whereas ours is 39.99% for ABHO and 36.11% if we exclude insider ownership. Hence, the result of this study is almost consistent with their results.

[4] Merger References: Competition Commission Guidelines, June 2003 CC2, Competition Commission, the UK, April 2007

[5] Horizontal Merger Guidelines, U.S. Department of Justice and the Federal Trade Commission, issued April 1992 and revised April 1997

Table 3.14 shows the state of ownership concentration variables accounting for the differences in industry sectors. It is observable that the concentration level varies among the different industry sectors. However, the voting power of the largest blockholder category (C1) is highest in the media and entertainment sector. It is also in the MEDIA that the coalitions of the first 2, 3, 4 and 5 largest blockholders attain the highest. This is consistent with the highest ownership concentration in the sector as can be observed from the result on ABHO for the sector.

Table 3.14: Mean of ownership concentration variables accounting for difference in industry sectors, pool sample of 2003-2007

Variable	INDUSTS	CONSULTS	MEDIA	ITS	ENERGY	FINANS	POOL
c1	16.49	14.21	17.38	16.69	15.16	15.73	15.93
c2	8.24	8.30	9.71	7.85	8.10	7.45	8.01
c3	5.18	5.83	5.97	5.59	4.70	4.77	5.16
c4	3.73	4.33	4.32	4.13	3.15	3.25	3.66
c5	2.60	3.04	3.13	2.97	2.34	2.19	2.55
cc2	24.73	22.51	27.09	24.54	23.26	23.18	23.94
cc3	29.91	28.35	33.06	30.14	27.95	27.95	29.10
cc4	33.64	32.68	37.37	34.27	31.11	31.20	32.76
cc5	36.24	35.72	40.50	37.24	33.45	33.39	35.31
hi3	794.17	479.59	764.08	745.15	834.32	628.16	688.85
hi5	826.86	520.03	804.72	782.92	862.30	657.50	721.88
abho	41.12	41.19	45.82	42.89	37.46	37.44	39.99
who	58.87	58.87	54.41	57.11	62.53	62.55	60.03
N	792	318	177	216	134	1019	2656

To sum up, the evidence from the aggregation of blockholder ownership and the use of concentration ratios and Herfindahl indices, even at the much lower threshold level, supports the long standing notion that the equity ownership in the UK public corporations is dispersed. The revelation of more blockholders by the use of smaller threshold of 3% has not changed the status quo in the notion of UK share ownership.

Finally, from the data of ABHO and WHO in *table 3.10,* it can be observed that ownership dispersion is higher in FTSE100 than non-FTSE100 firm category. The average WHO for the pooled sample is 60.03% and that of non-FTSE100 firms is 57.73%, whereas the figure is 71.6% for FTSE100 firms. This implies that ownership is less concentrated (highly diffused) in FTSE100 companies than in non-FTSE100 firms. The comparison of the figures of ABHO for FTSE100, non-FTSE100 and the pooled sample reveals also the same evidence. However, the figures of ABHO and WHO for REG, NOREG, FIN and NONFIN firm categories are around the mean of the pooled sample.

3.4.2.2 Evolution of Ownership Concentration

Table 3.15 presents the evolution of ownership concentration of the UK listed firms. It can be seen that the means of the ownership control and concentration variables, namely the individual first to fifth largest blockholders except C2 and C5, generally show increases during the period. C2 and C5 show trends of increases until they showed decreases only in 2007. Similarly, the results on the concentration ratios CC2, CC3, CC4, CC5 and ABHO show the trends of increase throughout the period under review. However, as it can be observed, WHO show some volatility, increasing initially and then decrease till the end of the period. Furthermore, HI3 and HI5 that are computed as the sum square of the first 3 and 5 largest blockholders respectively show volatility following their component parts. Their result that never exceeded 1000 indicates that share ownership is *moderately diffuse*.

Moreover, the changes and trends show the same pattern as the block ownership structure discussed previously. As it can be observed from *table 3.15,* the changes are not significant according to the t-tests for the difference of the means of the initial periods. Again, significant changes are noted for the later part of the period – between 2006 and 2007 – for the variables C3, C4, C5, CC5, HI5, ABHO, and WHO. The two tailed t-test statistics for change in CC5 is also significant at 12.17% significance level between 2006 and 2007. This again confirms that there might be some shocks that might have induced significant changes of trends from 2006 to 2007. This can be related to the economic interpretations given previously regarding the evolution of blockholder ownership.

Table 3.15: Evolution of average ownership concentration of the UK listed firms, at 3% threshold, for the period of 2003-2007 and t-test for the mean difference between years

	2003		2004		2005		2006		2007	POOL
variable	mean	T	mean	t	mean	t	mean	t	mean	Mean
c1	15.4	- 0.0761	15.46	- 0.4713	15.83	- 0.5577	16.26	- 0.4003	16.58	15.93
c2	7.486	- 0.8530	7.78	- 1.0961	8.163	- 0.3841	8.297	0.2558	8.216	8.006
c3	4.668	- 1.2155	4.939	- 0.9391	5.143	- 0.8222	5.315	- 1.6851*	5.638	5.160
c4	3.38	0.0050	3.379	- 1.3431	3.599	- 0.3997	3.664	- 3.3859* * *	4.208	3.661
c5	2.193	- 0.5722	2.278	- 1.2247	2.457	- 0.5105	2.53	- 4.6218* * *	3.190	2.547
cc2	22.88	- 0.3501	23.24	- 0.7585	24.00	- 0.5800	24.56	- 0.2447	24.79	23.94
cc3	27.55	- 0.5611	28.18	- 0.8757	29.14	- 0.6885	29.87	- 0.5395	30.43	29.10
cc4	30.93	- 0.5264	31.56	- 1.0186	32.74	- 0.7084	33.54	- 1.0117	34.64	32.76
cc5	33.13	- 0.5709	33.84	- 1.1221	35.20	- 0.7406	36.07	- 1.5488* (a)	37.83	35.31
hi3	673.9	0.0278	671.8	0.1739	659	- 0.4601	691	- 0.6895	742.4	688.8
hi5	703.9	0.0342	701.2	0.1540	689.9	- 0.5003	724.7	- 0.7748	782.5	721.9
abho	36.89	- 0.7713	37.98	- 1.1092	39.5	- 0.9738	40.8	- 2.4917* *	44.08	39.99
who	63.11	0.7037	62.11	1.1774	60.5	0.9674	59.21	2.5108* *	55.91	60.03
N	489		503		528		567		569	2656

* , * * and * * * Indicate significance at 10%, 5% and 1% level respectively. * (a) significant at 12.17%

Overall, the trends of ownership concentration variables are the same as that of ownership patterns shown in *section 3.4.1.2*. This might not be surprising since the values of the ownership concentration variables are computed from the values of the ownership variables. It can be observed that the same pattern of notable concentration changes occurred between 2005 and 2007 even though the significance of the t-test statistics is not observable between 2005 and 2006. Hence, it is suggestive that the change in ownership structure might trigger the change in ownership concentration or control structure of listed firms.

Florackis and Ozkan (2009) find that ownership concentration at 3 % threshold for the UK firms in their sample range from 36.06% in 2003 to 40.86% in 2005, thus showing increases. Hence, this study confirms the findings of Florakis and Ozkan (2009) even though there are small differences in the figures due to the difference in the treatment of insiders' ownership and difference in the sample.

Finally, from *table 3.12,* the results indicate that ABHO exhibited a general trend of increases across the years under review, whereas WHO showed a general decrease across the years for FTSE100 and non-FTSE100, regulated (REG) and non-regulated (NOREG) categories. The result confirms the previously discussed evidence that ownership concentration has been increasing. The results are as expected and that the classification of firms by size and into regulated and non-regulated firms is appropriate when we investment behaviour of owner categories.

However, the results shown in *table 3.12* for the categories of FIN and NONFIN misleading results of decreases in ABHO for FT100, NOFT100, and NOREG categories and general increases in WHO for FIN category. This casts doubt on the classification of firms into financials and nonfinancials when we investigate the investment behaviour of owner categories. Hence, it might be suggestive that the size of the firm and the regulatory effect on firms matter for investment considerations by investors. Finally, the interesting evidence from the results shown in the *table* is that ownership concentration is significantly lower (more diffusion of ownership) in larger firms than in medium or smaller firms. This can be viewed from the high difference between ABHO and WHO figures for FT100 and NOFT100 categories. This might confirm the suggestion that ownership diffusion will increase as firm size, and hence, its operation increases.

3.4.3 Blockholders Concentration

In this subsection, the analysis of descriptive statistics has been made in order to view the average state of the number of major blockholders in the UK public firms. *Table 3.16* presents the pooled statistics of the number of different blockholders categories, at 3% threshold, for the purpose of this study.

The problem with this study, firstly, is that some of the variables have quite very few observations. These include the number of family or individual (NFAMO), nonfinancial firms (NNFO), and government (NGOVO) owners, which exhibit high positive skewness, as it is observable in the table. Secondly, the number of insider owners (NINO) takes the nominal value of 0 and 1 taking directors as a group or a unit for a firm, which might explain that the variable is not normally distributed.

Table 4.16: Descriptive statistics of the number of blockholders of the pooled sample, at 3% threshold, for the period of 2003-2007

variable	N	min	p50	mean	p75	max	skewness	kurtosis
nino	2656	0	0	.2078	0	1	1.44	3.074
ninsto	2656	0	4	4.039	6	15	.7387	3.406
nnfo	2656	0	0	.1822	0	6	3.266	21.57
nfamo	2656	0	0	.2334	0	7	4.125	22.66
nbanko	2656	0	0	.355	1	3	1.567	5.053
ngovo	2656	0	0	.0286	0	2	7.036	57.36
nouto	2656	0	5	4.948	7	16	.625	3.447
nbh	2656	0	5	5.321	7	16	.4946	3.253

Overall, the average number of all blockholders (NBH) having significant ownership in the UK public firms is 6 when we round to the next whole number. Out of these, the average number of institutional investors (NINSTO) that have block ownership is 5, which is the highest blockholder category. This implies that out of the different blockholder categories, the highest number is that of institutional investors' category (around five-sixth of all blockholders), which is in conformity with the existing notion that they are the major block owners of UK shares. The next blockholder group is family or individual, and it is followed by insiders, banks and nonfinancial firms. Considering the median (P50) statistics, the median number of all blockholders (NBH) is 5, which is less than the mean. The median number of outside blockholders (NOUTO) is 5, which is equal to its mean. This implies that NOUTO is normally distributed. The fact that the median of NISTO, 4, is less than its mean (5) and the positive skewness imply that NINSTO is skewed in the right direction.

The evolution of the number of blockholders, as shown in *table 3.17*, shows some pattern of stability between 2003 and 2004 as well as 2005 and 2006 (only 2 variables showed significant changes) relative to the other time intervals in the period according to the t-test of the difference of their means between years.

Table 3.17: Evolution of the average number of blockholders of the UK listed firms, at 3% threshold, for the period of 2003-2007 and t-test for the mean difference between years

	2003		2004		2005		2006		2007	POOL
variable	mean	t	mean	t	mean	t	mean	t	mean	mean
nino	0.2147	- 0.0756	0.2167	0.7816	0.197	- 0.5295	0.2099	0.3234	0.2021	0.2078
ninsto	3.843	4.1034* * *	3.209	- 6.2919* * *	4.148	0.9457	4.000	- 5.6269* * *	4.88	4.039
nnfo	0.1554	0.2294	0.1491	0.2723	0.142	- 7.3131* * *	0.3616	9.9800* * *	0.0931	0.1822
nfamo	0.2658	0.8424	0.2247	- 0.3511	0.2405	0.9820	0.1993	- 1.0014	0.2408	0.2334
nbanko	0.3252	- 0.2019	0.332	- 4.5613* * *	0.500	14.4729* * *	0.067	- 15.2454* * *	0.5536	0.355
ngovo	0.0307	- 0.4349	0.0358	0.6010	0.0284	0.1626	0.0265	0.3446	0.0228	0.0286
nouto	4.630	4.0884* * *	3.950	- 6.9403* * *	5.059	- 0.6028	5.155	- 3.9565* * *	5.794	4.948
nbh	4.843	- 1.4556	5.091	- 1.0407	5.263	- 0.5808	5.358	- 3.6582* * *	5.953	5.321
N	489		503		528		567		569	2656

* , * * and * * * Indicate significance at 10%, 5% and 1% level respectively.

The variables that showed more volatility throughout the period are NINSTO, and NINO. NGOVO shows increases at the beginning of the period and steady decreases thereafter. NFAMO show

steady decreases and finally increases only between 2006 and 2007. However, NBH and NOUTO (though NOUTO shows decrease at the beginning of the period) show steady increases over the period of review. The volatility of the number of blockholders variables might indicate that the number of blockholders varies with the changes in the ownership stakes of owners' categories.

The most major significant changes in the mean of the variables happened between 2006 and 2007. Except NINO, NFAMO and NGOVO all the variables that show significant changes, namely NINSTO, NBANKO, NOUTO and NBH show increases. These significant changes coincide with the previous change in block ownership and ownership concentration for the period between 2006 and 2007, and hence, the same economic interpretation holds also for the changes of the number of different blockholders.

3.4.4 Controlling Blockholders

The first largest shareholder has the high probability for attaining control by influencing the decision process of a firm derived from the highest voting power. It might also resort to control the firm by forming a controlling coalition assuming that all voting powers on shares owned are used in voting. Therefore, it is important to analyse their position in the UK listed firms assuming that the first large shareholder is a controlling blockholder. However, the assumption is just theoretical, and the choice of this control factor as a variable for this study is just following the previous researchers (Faccio and Lang, 2002; Marchica and Mura, 2005). *Tables 3.18* and *3.19* present the descriptive statistics of the blockholders and the evolution of their mean values during the period.

Table 3.18: Means of the presence of first largest blockholders in the pooled sample, at 3% threshold, for the period of 2003-2007

stats	inc	instc	nfc	famc	bankc	outc	none
N	2656	2656	2656	2656	2656	2656	2656
mean	.1062	.7361	.0403	.0267	.0674	.8716	.0139

From *table 3.18,* the presence of INSTO as the first (largest) blockholder category in 73.61% of the firms indicates that institutional investors are the predominant shareholders as the first largest blockholder (C1), and that they control 73.61% of the firms in the sample when we theoretically assume that the largest shareholder in a firm is the controlling blockholder. The insider owners (INC) that appear as the first largest blockholder (C1) in 10.62% of the firms in the sample is the next in control the UK listed firms. It is, however, surprising that banks control about 6.74% of FTSE firms in the sample, in contrast to the notion that banks do not play a role in the control of the firms in market oriented counties like the UK. The rest of the blockholder types, namely nonfinancial firms (NFC) and family or individuals (FAMC) control around 4.03% and 2.67% respectively of the UK listed firms. As expected both nonfinancial firms and family or individual blockholders control very small percentage of the UK firms. Finally, the result also shows that 1.4% of the UK listed firms in the FTSE all shares Index do not have a controlling shareholder.

Table 3.19 presents the changes in the average of blockholder types that have the control potential on the UK firms in the sample. It is seen that there are some volatility in the changes. Hence, the percentages or number of firms controlled by any blockholder category shows some changes even though we do not have conclusively strong evidence due to insignificance of the t-test. The volatilities in the average percentage of firms controlled by the blockholders between 2005 and 2006 as well as 2006 and 2007 are not significant enough to conform to the previous analyses on evolution in blockholder ownership, and ownership concentration. However, the persistent increase in the control of the listed firms by institutional investors might imply that the UK institutional investors follow long strategy in equity investment in contrast to short-termism investment behaviour in some literature.

Table 3.19: Descriptive statistics of the evolution of the average proportions of the firms controlled by the first largest blockholders, at 3% threshold, for the period of 2003-2007 and t-test for the mean difference between years

	2003		2004		2005		2006		2007	POOL
variable	mean	t	mean		mean	t	mean	t	mean	mean
inc	0.1166	- 0.3242	0.1233	1.3701	0.0966	0.2762	0.0917	- 0.7761	0.1054	0.1062
instc	0.6912	- 0.6367	0.7097	- 0.4213	0.7216	- 1.5246* (b)	0.7619	- 0.9535	0.7856	0.7361
nfc	0.0491	0.5542	0.0417	- 0.4349	0.0473	0.5475	0.0406	1.5154* (a)	0.0246	0.0403
famc	0.0245	- 0.6906	0.0318	0.8962	0.0227	- 0.9131	0.0317	0.9200	0.0228	0.0267
bankc	0.0777	0.7388	0.0656	- 1.2980	0.0871	1.4845	0.0635	1.3203	0.0457	0.0674
outc	0.8425	- 0.2775	0.8489	- 1.4000	0.8788	- 1.0904	0.8995	0.9302	0.8822	0.8716
none	0.0204	1.0647	0.0119	- 1.1219	0.0208	1.9617	0.0071	- 0.6292	0.0105	0.0139
N	489		503		528		567		569	2656

* (a) Significant at 13%; * (b) Significant at 12.76%

3.4.5 Board Structure

From the descriptive statistics, presented as *table 3.20,* it is observable that the average board size is 9, where approximately 5 of which are nonexecutive directors and 4 of them are executive directors. The maximum board size for the sample is 28, whereas the lowest is 2. The result shows also that, on average, 63.75% of the board of directors of the UK FTSE All Share index companies are nonexecutive directors. The median proportion of nonexecutive directors, however, is 61.54%, which is not very far from the mean. Regarding CEO-duality, the result shows that about 25.13% of the firms in the sample have CEO-duality, and almost three-quarter (75%) of the firms separate the roles of the CEO and the Chairman.

Table 3.20: Descriptive statistics of the variables of board structures of the pooled sample for the period of 2003-2007

variable	N	p50	mean	max
ned	2633	5	5.075	15
ed	2633	3	3.208	16
bsize	2633	8	8.295	28
pned	2632	.6154	.6375	1
dual	2634	0	.2513	1

The result from the pool sample for all firm years stated above is for all firms in the sample. However, it has been necessary to see if there are differences between different types of industries. *Table 3.21* shows the breakdown of the mean of board structure variables according to industry types. The result show that the media sector (MEDIA), on average, have more nonexecutive directors (5.56 = 6) than other industries and the the pool sample (5.075 = 5). Moreover, the financial sector (FINANS) has less and the smallest number of executive directors and board size (2.257 = 3 and 7.552 = 8 respectively) than the rest of the industries and that of the average pool sample (3.208 = 4 and 8.295 = 9 respectively). It can be observed from the table that except for financial institutions, the proportion of nonexecutive directors ranges between 55.54% in ENERGY and 57.5% in ITS. In financial institutions (that include institutional investors and banks), the proportion of NED is 75.2%. Hence, the results might imply that all industry sectors complied to the requirements in the recommendation of the Code on NED.

Table 3.21: The mean of board structure variables over different industry sectors for the pooled sample for the period of 2003-2007

Variable	CONSULTS	ENERGY	FINANS	INDUSTS	ITS	MEDIA	POOL
Ned	4.468	5.462	5.310	4.950	4.948	5.199	5.075
Ed	3.368	4.273	2.257	3.880	3.571	4.116	3.208
Bsize	7.829	9.735	7.552	8.890	8.524	9.315	8.295
Pned	0.567	0.554	0.752	0.560	0.575	0.570	0.638
Dual	0.019	0.091	0.576	0.050	0.061	0.039	0.251
N	310	132	1010	789	212	181	2634

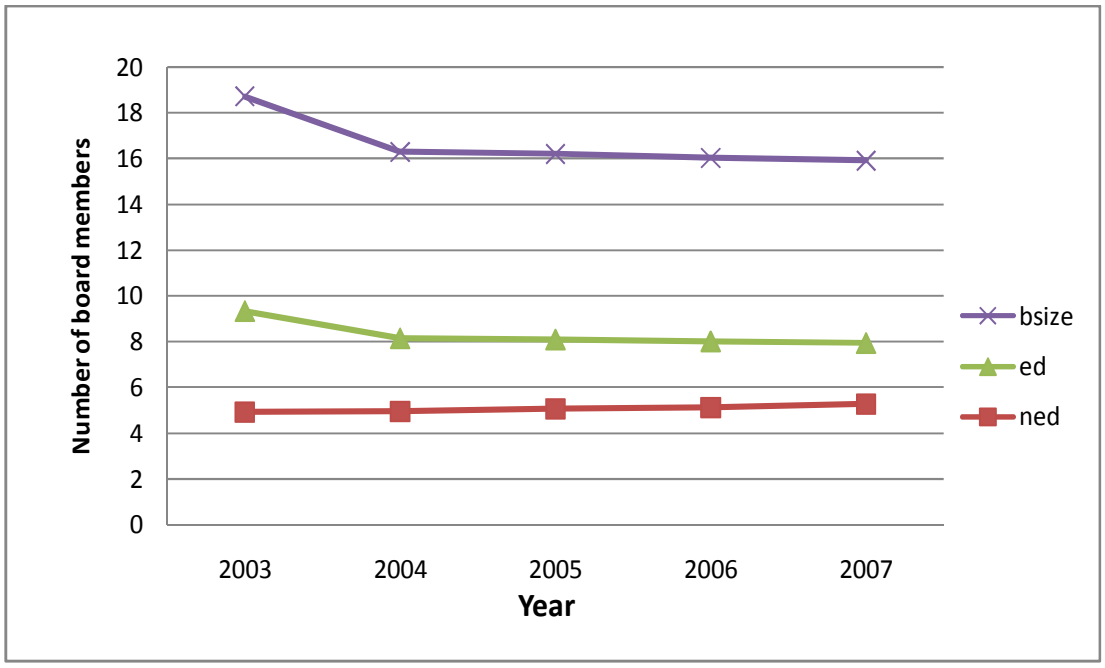
Furthermore, *table 3.22* presents the data of the average of board structure variables across different firm categories. It can be observed that FTSE100 firms have less board size and less nonexecutive directors' representation than the other categories, and that there is more duality in FTSE100 firms than in non-FTSE100 firms. It is surprising to note that board size is lower in FTSE100 firms than in non-FTSE100 firms since it seems that as firm size increases, more number of directors are needed to effectively manage the expanding intensity of the operations of the firm. It can also be seen that duality is more prevalent in regulated firms and financial categories than in non-regulated and nonfinancial categories.

Table 3.22: The mean of board structure variables over different firm categories based on size and regulatory effects on firms for the pooled sample for the period of 2003-2007

VARIABLE	FT100	NOFT100	REG	NOREG	FIN	NONFIN	POOL
ned	4.71	6.91	5.33	4.88	5.31	4.93	5.08
ed	2.92	4.68	2.49	3.76	2.26	3.8	3.21
bsize	7.64	11.6	7.81	8.67	7.55	8.76	8.30
pned	0.64	0.6	0.73	0.57	0.75	0.57	0.64
dual	0.29	0.03	0.52	0.05	0.58	0.05	0.25

Figure 3.4 and *table 3.23* show the historical evolution and test of mean difference between years for the board of directors' variables. It can be seen that the number of executive directors (ED) and board size (BSIZE) has been decreasing during the period. In contrast, what is interesting is that the number of nonexecutive directors (NED) and the proportion of nonexecutive directors (PNED) have shown steady increases from 2003 to 2007. From *figure 3.4,* it can be seen that NED has been increasing, whereas ED has been decreasing from 2003-2007. This might indicate that the decrease in the EDs has been substituted by the increase in the NEDs.

Figure 3.4: Evolution of board structure variables of the UK listed firms, at 3% threshold, 2003-2007



The important question is whether the changes in the board structure are significant or not. Even though *figure 3.4* shows sharp decline of ED and BSIZE between 2003 and 2004, the t-statistics in *table 4.16* show insignificance. Moreover, even though all board structure variables show insignificant changes between 2003 and 2005, there is still evidence from their mean values that there are changes in the board structures.

However, as it can be seen from *table 3.23,* there is strong evidence at 1 per cent significance level that the changes in ED, BSIZE and PNED are significant between 2005 and 2006 as well as between 2006 and 2007. This result conforms to the significant changes in block ownership, and ownership concentration that show the same trend between 2005 and 2007. Hence, the interpretation used previously holds also for the change in the board of director variables. Additionally, it might be suggested that since the compliance to the recommendations of the Combined Code of 2003 is voluntary, some companies might have been slow to comply with it, and it might have taken them more time to evaluate the implications until the gradual change in the variables became significant between 2005 and 2007.

Table 3.23: Evolution means for board structures variables of the pooled sample for the period of 2003-2007 and t-test for the mean difference between years

	2003		2004		2005		2006		2007	POOL
Variable	Mean	t	Mean	t	Mean	t	Mean	t	mean	mean
ned	4.916	0.1499	4.949	- 0.3331	5.070	1.2016	5.124	- 0.7018	5.273	5.075
ed	4.418	0.8237	3.202	1.1904	3.029	- 9.3068***	2.892	6.7556***	2.674	3.208
bsize	9.370	0.8918	8.145	0.3794	8.112	- 6.3335***	8.009	4.8092***	7.972	8.295
pned	0.5643	- 1.1599	0.6215	- 1.1884	0.6419	7.6267***	0.6588	- 4.6440***	0.6875	0.6375
dual	0.2401	- 0.3939	0.2525	0.4224	0.2529	0.7334	0.2615	- 0.9425	0.2482	0.2513
N	479		495		526		566		568	2634

*, ** and *** Indicate significance at 10%, 5% and 1% level respectively.

3.5 DISCUSSION AND CONCLUSION

The investigation of corporate ownership structure during the period of 2003-2007 confirms that insiders own about 4% while outsider blockholder categories own 36.07% of the outstanding shares of the UK listed firms. The result shows that the average ownership stakes of state, family or individual, banks and nonfinancials range from 0.15% to 2.59%. It also indicates that institutional investors own the highest proportion of the UK listed firms common shares (28.94%), thus confirming the evidence that the UK institutional ownership is still the most important ownership type in modern UK corporations.

Moreover, the historical evolution of block ownership shows that there might be a substitution of ownership stakes between institutional investors and other blockholders, where the decreases in the stakes of others might be gained by the increases of institutional investors, which shows decrease only in 2006. This is in contrast to the data of ONS that shows the decrease and increase of the UK institutional investors' holdings and the foreign ownership respectively. The trends of other owner types also vary from the data of ONS since the ONS (though 2005 and 2007 data are missing) has all the stakes of beneficial owners unlike ours with 3% or above. The difference in trend might be due to, among other things, the aggregation of foreign institutional owners with the UK institutional investors. The result also shows evidence that the trends of bank and state ownership is quite similar to that of institutional investors, while the trends of nonfinancial owners exhibit similarity with insider ownership.

There are interesting patterns or trends in the distribution of ownership that can be noted from the results. Firstly, INSTO, BANKO, FAMO and GOVO show decrease between 2005 and 2006, whereas the holdings of insiders (INO) and nonfinancial firms (NFO) show increase in the period. Secondly, the stakes of the outsider blockholder categories (INSTO, BANKO, FAMO, and GOVO) show increases between 2006 and 2007, whereas that of INO and NFO show decline in the period. This evidence also confirms the substitution of ownership between outsider owner categories on the one hand and insider owner and nonfinancial owner categories on the other hand.

The increase in the holdings of outsider blockholders categories, namely INSTO, BANKO, GOVO and FAMO between 2006 and 2007 might be due to the outsider investors' overconfidence and optimism from the positive developments and health in the economy in the initial periods of the time under review. The insight from the evidence is that all owner categories that are institutions like INSTO, banks and state share might follow each other, or especially the institutional investors that are more informed than other outside owners.

On the other hand, the decrease in the ownership stakes of INO and NFO between 2006 and 2007 might indicate that the investor categories might have foreseen the looming financial crisis that showed up after a year and sold their stakes. The insights from this evidence are (1) that as the ownership of insider owners that run the firms and nonfinancial firms that are also directed by their management exhibit similar trends, especially in times of foreseen crisis or shocks, (2) that management of nonfinancial owners that make investment decisions might have network of relationships with insider owners of the firm in which they invest and might follow each other in actions, and (3) that nonfinancial firms that are managed by their respective insiders might be as informed as the inside owners of the firm in which they invest.

Furthermore, there is strong evidence that significant changes in ownership pattern occurred between 2005 and 2006 as well as between 2006 and 2007, where the change in the major outsider blockholder types (INSTO, NFO, FAMO, and BANKO) and the aggregating of ownership blocks (OUTO, ABHO, and WHO) are found to be statistically significant. The rationale for the systematic changes between 2005 and 2007 might also be explained by the recent development in corporate governance of the UK, namely, the Higgs Report and the Combined Code in 2003 that recommended some changes in the corporate board structure. The evidence of the volatility in the trends of ownership of most outsider blockholder categories in the early years of the period under review (2003-2005) might suggest that due scepticism on the implementation and impacts of the Code, outside investors might have been reluctant in taking high risk by buying more shares, and hence, increase their stakes. It might be added that all outsider owners' categories increased their stakes significantly between 2006 and 2007 after having observed the increase in insider ownership between 2005 and 2006 and due to overconfidence and optimism from the positive developments and health in the economy in the initial periods of the time under review.

The sensitivity analysis of the state and evolution of block ownership structure using different categories of firms in the pooled sample show interesting results. The investors' behaviours and the trends of different blockholder categories are consistent with the results of the pooled sample discussed above, namely, (1) similar behaviour or characteristics of INO and NFO; (2) similar characteristics of the components of external blockholder category (especially INSTO, FAMO, BANKO); (3) the significant changes reflected from the high rates of change in ownership structure patterns between 2005 and 2007; and (4) a general trend of increases of ABHO and decrease of WHO across the years for FTSE100, Non-FTSE100, Regulated and non-regulated firm categories, thus indicating the increase in ownership concentration during the period under review and that the classification of the sample by size and regulatory effects might be more appropriate than by financial respect (financials and nonfinancials) to reveal characteristic features of group homogeneity and heterogeneity in the patterns of ownership structure.

However, there is also new evidence that: (1) insiders hold more shares in non-FTSE100, nonregulated, and nonfinancials than in FTSE100, regulated and financial firms; (2) institutional investors hold less proportion of shares of FTSE100 than the rest of the categories, in which they hold almost the proportion that is almost around the mean of the pool (28.94%); (3) nonfinancial companies (NFO) hold higher proportion of shares in nonregulated firms outstanding and nonfinancial or industrial firms, and this might imply that the prefer nonregulated companies than the regulated firms; (4) family or individual owners are indifferent regarding the regulatory effects on firms and they hold higher shares in smaller firms than in very large firms (FTSE100); and (5) bank ownership is around the average of the pooled sample for all considered categories; (6) insider investors might have been pulling their stakes in non-FTSE100 and pooling it into FTSE100 firms during the period under review; and (7) from the results on WHO and ABHO, ownership dispersion is higher in FTSE100 than non-FTSE100 firm category, whereas it is not sensitive to the categorization of the overall sample into regulated, non-regulated, financials and nonfinancials.

The mean statistics of the variables for ranked largest blockholders and concentration ratios show also interesting results. Firstly, the average equity owned by the first largest shareholder is about 16% of outstanding shares of firms in the sample. This shows that the first largest blockholder cannot attain control of the firm. Secondly, the concentration of equity ownership in the first 3 and 5

largest blockholders is 29.1% and 35.31% respectively and this confirms the fact that share ownership is dispersed in the UK listed firms. Hence, the evidence from the concentration ratios indicative that even if the first five largest blockholders, on average, form coalitions or voting pacts, they cannot attain absolute or majority control (more than 50% voting power derived from ownership rights), thus indicating that control of firms in the UK might be highly contested.

Additionally, the result shows that about 40% of all firm's common shares are held by all blockholder categories and that most of the outstanding common shares of FTSE All Share firms (60.3%) are widely held by dispersed shareholders, who own less than 3% in any one company they invest in. This results show evidence of the popular notion that ownership of the UK listed firms is dispersed since the voting power of the coalition of all blockholders does not attain absolute or majority control. Moreover, though the use of Herfindahl indices to measure share ownership concentration is criticized, the evidence also confirms that UK listed firms' share exhibit dispersed ownership.

The sensitivity analysis made on the different firm categories reveal that ownership concentration is significantly lower (there is more diffusion of ownership) in larger firms than in medium or smaller firms (as viewed from the high difference between ABHO and WHO figures for FTSE100 and non-FTSE100 categories), thus confirming the suggestion that ownership diffusion will increase as firm size, and hence, its operation increases.

Furthermore, there is evidence that ownership concentration (CC2, CC3, CC4, CC5, and ABHO) of the listed UK firms has been increasing during the period (2003-2007), and that ownership concentration remained moderately diffuse throughout the period. The evidence of significant changes in ownership concentration between 2006 and 2007 confirms that there might be some shocks that might have induced such trend that coincides with that of block ownership at the same time period.

Regarding the number of blockholders, the average number of all blockholders in the UK public firms is 6 rounding to the next whole number. Its median is 5. The result shows that institutional investors are the largest blockholder in terms of number (5 out of the average 6 blockholders for mean, and 4 out of 5 for median), and this is in conformity with the existing notion that they are the major block owners of UK shares. The result on the evolution of the number of blockholders show evidence of significant changes in the means of most of the variables between 2006 and 2007, and this coincides with the evidence on the block ownership and ownership concentration. Additionally, there is evidence of volatility of the number of blockholders throughout the period. This might indicate that the number of blockholders varies with the changes in the ownership stakes of owners' categories.

As for the controllers of firms assuming that the first largest shareholder category is in control of the firm theoretically, there is evidence that institutional investors are the predominant shareholders, controlling absolute majority (73.61%) of the firms in the sample. The next in the control position are ranked as follows: around 10.62% by insider owners (INC), 6.74% by banks, 4.03% by nonfinancial firms and 3% by family or individuals. The result also shows that 1.4% of the UK listed firms in the FTSE All Shares Index do not have a controlling shareholder. Moreover, the result on the evolution of the mean of the control by the blockholders types except institutional control show that there are some volatility in the average firms controlled by blockholder categories even though they are not statistically significant. The persistent increase in the control of the listed firms by institutional investors might imply that the UK institutional investors might follow long strategy in equity investment in contrast to short-termism investment behaviour in some literature.

Finally, the results on the board structure variables show evidence that (1) the UK listed firms on average have small number (average of about 9) of board member, (2) the majority of the board members (61.54%) are nonexecutive directors (NEDs), and (3) about three-quarters of the firms separate the roles of the CEO and the Chairman. There is also evidence that the proportion of nonexecutive directors for the nonfinancial industry sectors (ENERGY, INDUSTS, CONSULTS, MEDIA and ITS) ranges between 55.54% and 57.5%, while that of the financial institutions (FINANS) is 75.2%. Furthermore, the evolution of all of the board variables shows evidence of significant steady increases of number of executive directors and proportion of nonexecutive directors and significant steady decreases in the board size. Hence, the evidence from the study show that more of the UK listed firms in the sample complied with the stated board characteristics variables of the Code and that there is difference in compliance to the Code regarding proportion of nonexecutive directors and CEO-Duality between nonfinancial sectors and financial institutions.

The study has presented some evidence from the results discussed above. One of the main findings of the study of research interest is that the first largest blockholder might not be ultimate controller of the firm and that the coalition of the first 5 largest shareholders cannot even attain majority control in terms of their aggregate voting power. Hence, this study suggests that individual blockholder might not have the ability to control the firm solely and influence firm performance and that control might be contested in the UK listed firms. So, the study suggests further research into the impact of ownership and control structure and the contestability of control.

Moreover, this study has its own delimitations. Firstly, we would like to note that this study is delimited in its use of the UK disclosure level of 3% threshold. Higher or lower cut-off levels are not used due to the reasons and rationale discussed in this report and knowing for sure the inevitability of different results as reported by researchers. Secondly, some of the ownership and control structure variables exhibit skewness, and this might question their normality. Thirdly, the study falls short of revealing the control configuration of the listed firms and how blockholder categories and ownership concentration influence firm performance. Finally, the research has not undertaken comparative study with at least another country.

Nevertheless, the results show interesting recent evidence on the pattern and concentration of ownership, some control structures and board structure of the UK listed firms in the Index. The strength of the study is that (1) it involved several ownership and control structures in the analysis; (2) it has used both the pool sample analysis that reveals the overall state of ownership and control structure variables for the period under review, and the year-to-year analysis that reveals the evolution of ownership and control structure. One of the lessons that can be drawn from this study is that the corporate ownership and control structures show volatility and variance across years even though some of the changes are not significant.

Even so, there is still a question on how the ownership and control structures affect firm performance. Hence, the important research issue is the implication of the ownership and control patterns to the firm performance and to the shareholders value, and how blockholders interact and share corporate control. Therefore, the study might suggest the undertaking of further research on the impact of the ownership and control variables on firm performance and the contestability of control hypothesis related to blockholders structure.

CHAPTER FOUR

OWNERSHIP STRUCTURE AND FIRM PERFORMANCE IN THE UK: EVIDENCE FROM THE AGENCY PERSPECTIVE

4.1 INTRODUCTION

The property rights theory and the legal approach to finance affirm that shareholders are the residual claimants or the rightful owners of modern listed firms; and the agency theory posits that managers are agents of shareholders (principals) and they run the firm on behalf of the owners and that that there is a principal-agent relationship between the parties. Extensive literature indicates that there is conflict between shareholders and managers, where it is hypothesized that managers diverge from shareholders' interest and reduce and/ or appropriate the shareholders' wealth (Jensen and Meckling, 1976; Fama and Jensen, 1985; La Porta et al., 1998; Shleifer and Vishny, 1997, La Porta et al., 2000, 2002). In corporate governance, the issue of shareholder-manager conflict has triggered extensive research on the relationship between corporate ownership structure and firm performance.

Since the seminal work of Berle and Means (1932), which states that ownership is separated from control and that managers are controlling US firms and hence there are dispersed shareholders that are powerless, literature shows that several researchers have analyzed the shareholders-managers conflict. In particular, the agency theory developed by Jensen and Meckling (1976) has provided a framework or tool to explain the reduction of shareholder wealth in the settings of the principal-agent relationship, where owners (principals) delegate managers (agents) to run the firm on their behalf (Jensen and Meckling, 1976). The settings would lead to agency problems or conflicts since both parties are utility maximizers and managers might diverge from maximizing shareholder returns.

On the other hand, literature reveals that the second-type agency conflict arises between the controlling large shareholder and minority shareholders in countries or firms with concentrated ownership structures. There are two contradicting views regarding the controlling large shareholder-minority shareholders relationship. One view is that the conflict of interest between controlling blockholders and minority shareholders might arise when the controlling large shareholders make decisions for *the private benefits of control*, whereby they appropriate the wealth of minority shareholders (Grossman and Hart, 1980; Barclay and Holderness, 1989; La Porta et al. 1998, 2000, 2002; Dyck and Zingales 2004). In contrast to this divergence of interest and the expropriation hypothesis, Shleifer and Vishny (1986, 1997), argue that large and controlling shareholders contribute to the mitigation of the agency problems because they have the incentives and capacity to monitor the managers for the *shared benefit of control.* Moreover, relating to this, Demsetz and Lehn (1985) write that as ownership concentration increases, the degree to which benefits and costs

are borne by the same owner will increases. Hence, it might appear that large shareholders having larger stakes in the firm would not sit idle but raise their activism in corporate governance to monitor or control the firm in order to avoid the bigger risk they would bear in proportion of their stake.

Therefore, based on the two agency perspectives stated above, namely, the manager-shareholder conflict and the large shareholder-minority shareholders conflict, the important questions that can be posed related to the assumption of the separation of ownership from control are: *Do shareholders have the incentive and ability to exert control if the managers diverge from value maximization and to enhance firm performance? What is the impact of different blockholders on firm performance? Do external blockholders benefit or exploit (appropriate) minority shareholders?* These basic questions call for the investigation of the potential link between ownership structure and firm performance based on the assumption that shareholders with significant voting power might have the incentives and ability to control and enhance firm value (Leech and Leahy, 1991).

Literature on the extensive study of the relationship between ownership structure and firm performance shows that researchers (Demsetz and Lehn, 1985; Agrawal and Mandelker, 1990; Agrawal and Knoeber, 1996; Himmelberg et al., 1999; Demsetz and Villalonga, 2001; Weir et al., 2002; Hillier and McColgan, 2006, and several others) use different (1) assumptions and models, (2) measures of performance and ownership structure, (3) control and/ instrumental variables and their measures or proxies, (4) block owner categories, (5) time horizon or periods for the sample data, and (6) data types (cross-sectional or panel), among other things. It might be arguable that the differences in the choices made might explain the mixed results and ambiguous conclusions in the existing empirical works. Hence, this research study considers the following important issues in order to investigate the relationship between ownership structure and firm performance.

Firstly, many of the past studies try to analyze the effect of only one or few of the blockholder categories on firm performance. For instance, Morck et al. (1988), Hermalin and Weisbach (1988, 1991), Cho (1998), and others made their studies on the impact of insider ownership. Grifith (1999) investigated the impact of CEO ownership in addition to managerial ownership on firm performance. Likewise, some of the studies focusing on ownership concentration (Demsetz and Lehn, 1985; Leech and Leahy, 1991; Holderness and Sheehan, 1989; Himmelberg et al., 1999) leave out the direct impact of individual blockholder categories. Nevertheless, the use of different measures of ownership structures and the omission of relevant ownership variables might contribute to the differences in the results and the ambiguity of conclusions. Hence, considering this and following Seifert et al. (2005), the empirical analysis of this research will involve almost all major types of blockholders (*table 4.2)* in order to fill the exclusion bias. Nevertheless, this research is limited in that the insider ownership is still aggregate ownership of executives and non-executive directors. However, unlike the studies mentioned above, it will also analyze the association of the ownership of non-financial firms with performance since they might influence firm performance through the significant blocks of shares they hold, and or the use their network relationships with the firm in which they invest or the subsidiary they establish.

Secondly, several related studies like McConnell and Servaes (1990), Himmelberg et al. (1999), Demsetz and Villalonga (2001), and Seifert et al. (2005) use none or few governance mechanisms as control variables. However, only few studies (Agrawal and Knoeber, 1996; Weir et al, 2002; Hillier

and McColgan) controlled for most of the mechanisms. The failure to control for the mechanisms might (1) omit the suggestion of the agency theory, which states that governance mechanisms mitigate the agency conflict between owners and managers, and (2) exclude the relevant variable that might influence performance from the model thus leading to specification error. On the issue, Walsh and Seward (1990) assert that firm performance is crucially dependent on the efficient operation of the governance mechanisms. Hence, this research follows Agrawal and Knoeber (1996), Weir et al. (2002) and Walsh and Sward (1990) and investigates the impact of all mechanisms except managerial labor market. It extends the work of Weir et al. (2002) by using (1) panel data instead of cross-sectional data, (2) lagged performance variable in various non-OLS estimation methods; and (3) stock price volatility in the model in order account for the monitoring role of the capital market.

Thirdly, literature survey shows that performance, ownership structure and board structure might be endogenously determined (Demsetz, 1983; Demsetz and Villalonga, 2001; Himmelberg et al., 1999; Hermalin and Weisbach, 1988; Helmalin and Weisbach, 1998; Hermalin and Weisbach, 2001). Demsetz (1983), argues that firm ownership structure is endogenously determined, influenced by several factors in the competitive environment and its own performance. This also suggests that performance also determines ownership structure, implying the reverse causality problem or nonrecursive relationship between ownership structure and performance.

Moreover, Hermalin and Weisbach (2003) suggest that almost all variables of board structure are endogenous variables and that are jointly determined. They also argue that the actions of the previous directors affect performance and that performance can itself influence the choice of subsequent directors. Hence, this implies the joint endogeneity of ownership structure and board structure and the dynamic endogeneity of board structure. They also suggest that firm performance, CEO turnover, and changes in ownership structure are important factors effecting the change in boards. So, there might also be the reciprocal or reversal causal (nonrecursive) relationship between goes from performance to the board of directors and the dynamic endogeneity relationship between firm performance and board structure. Hence, there is indication of joint determination of performance, ownership structure and internal governance mechanism or board structure (Hermalin and Weisbach, 1988; Barnhart and Rosenstein, 1998).

Another joint endogeneity problem to consider is the relationship between internal and external governance mechanisms, which is expressed as substitution and complementarity effects. Explaining an instance of substitution effect between capital market and the ineffective board structure, Jensen and Meckling (1976) state that the divergence of managers from shareholder value maximization will be constrained by market for the firm itself, the capital markets, where it might be possible to sell own shares and impact change in ownership structure. More broadly, Walsh and Seward (1990) suggest that all of the internal and external control mechanisms are inextricably linked and that they are different alternative responses to similar problems. Additionally, Rediker and Seth (1995) suggest the theoretical possibility that firm performance depends on (1) the efficiency of a bundle of corporate governance mechanisms, and (2) the substitution between different governance methods in controlling the agency problems. They provide empirical evidence of the existence of the substitution effects between monitoring by the board of directors and manager's mutual monitoring, and between the monitoring potential of the boards and the alternative governance variables.

Moreover, the governance mechanisms are regarded as interrelated complementary ways to oversee the conduct of management. Agrawal and Knoeber (1995) suggest that higher insider ownerships, institutional ownerships, external block ownership and representation of outsiders on the board might have positive correlation with takeover markets due to lower transaction costs and the reduction of free-rider problem that might lead to the rejection of the tender offer by small shareholders. So, we assume that a bundle of governance mechanism might complement or substitute for each other in controlling the agency problems and enhancing firm performance following Walsh and Seward (1990, Rediker and Seth (1995), Agrawal and Knoeber (1996), and Weir et al. (2002).

Hence, the reverse causality, dynamic endogeneity and the joint determination problems between the involved variables might make the link between ownership structure and performance complicated. This study is limited in terms of applying appropriate and effective methodology to account for the reverse causality and joint determination problem, which might necessitate a structural modelling. Nevertheless, following Weir et al. (2002) our study accounts for dynamic endogeneity by including the lagged performance variable as independent variable and investigates whether there is a positive or negative association between ownership structure and performance. Moreover, it will extend the work of and Rediker and Seth (1995) and analyze the substitution and complementarity effects from the correlation among governance mechanisms.

Fourthly, literature search shows different studies use different thresholds to measure ownership structure. La Port et al. (1999), Faccio and Lang (2002); Franks and Mayer (1997); Claessens et al. (2000); Holderness and Sheehan (1988); Ghadoum et al. (2005) and others used 25%, 20% and/ or 10% cut-offs for control. Other studies that use 5% cut-off are Shleifer and Vishny (1986), McConnell and Servaes (1990), Short and Keasey (1999), Agrawal and Mandelker (1990), Weir et al. (2002), Marchica and Mura (2005) Thomsen et al. (2006), Hillier and McColgan (2006) and others. Moreover, Franks et al. (2001), Crespi and Renneboog (2003) and Florackis and Ozkam (2009) use 5% and/ or 3% cut-offs in their investigation of the UK firms.

Hence, taking into consideration the uncommon large shareholdings in the UK (Mayer, 2002) and the historical institutionalization of UK share ownership due to substitution effect between institutional investors and household investors (Rydqvist et al., 2008; Kahn, 2006), in line with the recent studies on the UK by Franks et al., 2001, Crespi and Renneboog (2003) and Florackis and Ozkam (2009), which used the thresholds of and 3%; in conformity with the UK disclosure rule; and based on the provision of the UK Company Law and the London Stock Exchange listing rules, 3% threshold is used to compute different ownership structure variables.

Finally, this study analyses uses several estimation procedures rather than relying on one or two methods in order to investigate the relationship between ownership structure and firm performance. Hence, the procedures to be used are (1) different types of robust regressions (White's sandwich robust, cluster robust and iteratively weighted least squares robust regressions) for primary analyses besides the OLS, which is used for testing the Gaussian assumptions, and (2) median regression, fixed-effects regressions, and generalized estimation equations (GEE) for sensitivity analyses. This is sought to verify the consistency of the results or evidence and to handle some characteristics of the sample, for example, heteroscedasticity and autocorrelation, which violate the OLS assumptions and necessitates other appropriate estimation methods.

Hence, in undertaking the analyses, two regression equations or models are specified considering the influence of (1) blockholders, and (2) insider and outsider ownerships, where the rest of the independent variables (governance and observed firm specific characteristics) are controlled for. The results from the different appropriate non-NIID estimation methods for primary and sensitivity or consistency analyses generally show consistent evidence across different performance measures. The main findings of this research are summarized as follows:

- Firstly, that there is a relationship between ownership structures, measured in proportion of shares held by blockholders categories, and firm performance measured in return on assets (ROA), return on equity (ROE), market-to-book value (MTBV), and price earnings ratio (PER). Anyhow, the result reveals that there is a strong evidence of more consistent patterns of relationship between ownership structures and the accounting measures of firm performance (ROA and ROE) than with the valuation based measures (MTBV and PER).

- Secondly, there is sufficient and strong evidence from the UK data to support the evidence revealing that the relationship between insider ownership (INO) and performance is nonlinear. INO, square of insider ownership (INO^2) and cube of insider ownership (INO^3) are found to have significant positive relation with performance, confirming nonlinearity of their relationship and the alignment of interest hypothesis of the agency perspective and in contrast to the alignment-entrenchment or alignment-entrenchment-alignment hypothesis in literature.

- Thirdly, the decreases in the coefficients of linear insider ownership, square of insider ownership and cube of insider ownership might suggest evidence of the rise in the alignment of interest at a decreasing rate, thus exhibiting the diminishing marginal productivity of the firm as managerial ownership increases. It might also be argued that the reduced rate of performance with the different roots of the polynomial might indicate the potential for both an incentive and an entrenchment effect, which are supposed to happen at the same time with one outweighing the other after a certain degree of ownership level. Hence, it might be suggestive that the reduced rate of performance could be due to the increasing impact of the entrenchment effect which reduces the positive benefits from the incentive alignment effect.

- Fourthly, nonfinancial firms' ownership (NFO) also shows same but linear relation, thus suggesting that INO and management of nonfinancial firms' stakes that make investment decisions in other firms enhance firm performance.

- Fifthly, there is consistent evidence that institutional investors, nonfinancial firms, family investors, state and the aggregate holding of external blockholders (OUTO) are negatively associated with firm performance, and this might support second-order agency theory and the appropriation hypothesis.

- Sixthly, the lagged performance variables used as explanatory variables in order to account for dynamic endogeneity are found to be strongly and consistently positively associated with firm performance. Even the few studies that attempted to account for dynamic endogeneity such as Weir et al. (2002) and Hillier and McColgan (2005) are different from this research.

This study confirms Weir et al. (2002) that used only OLS estimation and cross-sectional data unlike this research that uses several estimation methods for panel data. It is to be noted that the research is also different from Hillier and McColgan (2005) that uses lagged ROA and change in assets (for growth prospects) as independent variable in assessing the influence of board structures.

- Finally, there is strong evidence that board structures (proportion of nonexecutives, duality and board size) are associated with firm performance; and that the evidence of negative impact of CEO-duality and board size confirm the agency theory perspective and the rationale behind the recommendations of the UK Codes of Best Practice regarding CEO-duality and board size.

To sum up, this research fills the gaps discussed previously regarding our research area by accounting for some of the sources of differences in results or evidence about the investigation. These sources are: (1) the use of different and relevant blockholders or ownership measures; (2) the use of lower threshold level that would accommodate the potential players (blockholders) in corporate governance, (3) the control of major governance mechanisms, (4) the endogeneity of ownership structure, (5) the substitution and complementarity effects between governance mechanisms, and (6) the use of different estimation procedures for primary analyses and for sensitivity or consistency analyses.

Hence, the contribution of this research to knowledge is that it provides (1) some comprehensive evidence using procedures that incorporate some of the main gaps regarding the sources of differences in the research literature on the impact of ownership structure on firm performance, (2) the recent and updated evidence on the relation between ownership structure and firm performance in major UK public firms, (3) the evidence on the prevalence of multiple blockholders and their negative impact on performance might con firm the existence of the second-type of agency conflicts in the UK listed firms that have dispersed ownership, and (4) consistent evidence that confirm more of the agency perspectives and some of the premises behind the recommendation in the UK Codes concerning some board characteristics that influence firm performance.

The rest of the *Chapter* is organized as follows. *Section 4.2* deals with the brief discussion of theoretical frameworks relevant to this research. Then hypotheses formulation is undertaken in *section 4.3*. The section that follows introduces the methodological issues of the sample, data analyses, description of variables, model specifications and the implied estimation methods for the study. *Section 4.5* presents and interprets the empirical results of the primary analyses. *Section 4.6* presents the sensitivity or consistency analyses. Finally, *section 4.7* deals with discussion and conclusion.

4.2. THEORETICAL FRAMEWORK

A survey of literature suggests that some theories that have been used to explain the shareholders-managers conflict are mainly the property rights theory, the agency theory, the transaction costs theory, and the stewardship theory. The most popular of these theories that have wide applicability to the conflict is the agency theory. The popular view of the agency theory is that conflicts of interest arise in the relationship due to the divergence of managers' (assumed rational but opportunistic) from the shareholders' interest. The theory provides a powerful theoretical basis for explaining the relationships and suggesting solutions for the agency problems between shareholders and managers (Jensen and Meckling, 1976; Fama and Jensen, 1983).

The core assumptions of the agency theory are that: (1) managers may maximize their own utility instead of enhancing shareholder value (Jensen and Meckling, 1976; Demsetz, 1983); (2) contracts are not costless when writing and enforcing (Fama and Jensen, 1983); and (3) information are distributed asymmetrically between principals and agents, and (4) the parties have limited or bounded rationality. The premise of the theory is that due to the asymmetric information in the managers-shareholders relationships, where principals cannot correctly measure the efforts of managers who know the details of the operations of the firm, both parties might incur some costs.

The total agency costs include monitoring costs, bonding costs and residual losses (Jensen and Meckling, 1976). Monitoring costs are the costs incurred by shareholders for monitoring the conduct of managers. And the bondng costs are financial or non finanacial costs of setting up systems or structures that would make the managers seen as acting in the best interests of the shareholders or compensate them accordingly if they do not (Jensen and Meckling, 1976). Moreover, residual loss is the loss that occurs due to the mismatch of the actions that would promote the self-interest of the principal and that of the agent, despite monitoring and bonding activities. Putting in another way, Fama and Jensen (1983) state that it is the value of profit lost because the contract's full enforcement costs exceed its benefits.

The agency theory's analogy to the shareholder-manager conflict is the classical prinicipal-agent relationship. In the relationship the owner hires a manager, who runs the firm in the best interest of the owner and get reward for the efforts in return (Jensen and Meckling, 1976, Sappington, 1991; Hart, 1995). The performance or outcome depends on the extent of the agent's efforts and the risks available. However, agent's effort are not fully observable to the principal and thus the information asymmetry makes it difficult for the principal to measure the efforts made and set reward for the risk-averse agent (Sappington, 1991). In this incentive-risk puzzle (Hart, 1995) of agency relationship, the relevant issue is how to determine the optimal balance between efficiency and risk-bearing. The principal might thus employ other monitoring schemes in order to control the desired action of the agent and incur monitoring costs (Sappington, 1991; Arnorld and De Lange, 2004). The problem of information asymmetry is related to the adverse selection and moral hazard problems. Principals face adverse selection problem because they cannot correctly verify the skills or abilities the agent claimed to have at the time of hiring. So, they might not be able to select the best applicant or to know whether the agent is performing the duties properly or not (Eisenhardt, 1989).

The moral hazard agency problems, first proposed by Jensen and Meckling (1976), arise when managers might not make the required managerial efforts in the best interest of the principal. Since

the principal might not know this fully, they need information to monitor the effort level and measure it in order to reward it correctly. According to literature, the sources of such problems are related, for instance, to managers' investment decisions - underinvestments or over-investments, free cash flow, earning retentions, shirking – that diverge from the positive net present value rule (Jensen, 1986, 1993; Shleifer and Vishny, 1986; Jensen and Murphy, 1990; Dhumale, 1998).

Moreover, the agency perspective provides testable hypotheses or explanations and suggestive solutions to agency conflicts. Some of the important hypotheses are the incentive alignment (Jensen and Meckling, 1976; Jensen, 1993), alignment-entrenchment-alignment (Stulz, 1988), free cash flow (Jensen, 1986), large shareholder monitoring (Vishny and Shliefer, 1986, 1997), private benefit of control, and shared benefit of control. The theoretical or conceptual frameworks also suggest that different corporate governance mechanisms or arrangements (takeover markets, debt financing, stock markets, managerial labour markets, etc.) would mitigate the agency costs and enhance shareholder returns (Jensen and Meckling, 1976; Fama and Jensen, 1983). These theoretical issues will be discussed in more detail and used in hypotheses development in *section 4.3*.

However, the shortcoming of the agency theory is that it does not by itself provide a role for governance structure (or asset ownership) due to the fact that the principal-agent contracts are not optimal because they might not specify the fully observable and verifiable obligations of all parties in all future states of the world (Hart, 1995). Hence, like other related theories, the theory does not provide a complete contract that can provide the best and appropriate decisions on incentive schemes among other things. The incentive is not entirely and directly based on the current efforts of managers but also on future performance, where managers might be penalized when external shocks that are outside their control affect performance. Nevertheless, the agency theory is still a powerful tool equipped with logical framework that provides testable hypotheses.

Furthermore, the other conflict difficult to explain in the principal-agent setting is the large shareholders-minority shareholders conflict, which is termed as the second-order agency problem. The principal-agent relationships might not be extended to explain large shareholder-minority shareholders conflict since the controlling large shareholders might not be literally referred to as agents, whereas minority shareholders are principals. Nevertheless, the law and finance researchers provide explanations to the exploitation of minority shareholders by the controlling shareholders.

An alternative theory that explains the conflicts is the property rights theory (PRT), which approaches the issue in terms of institutional and circumstances inhibiting the failures to reach satisfactory contractual agreements, and discusses the problems in assigning property rights that would lead to efficient contractual agreements and outcomes (Libecap, 1989; Eggertsson, 1999; North, 1990; Kim and Mahoney, 2005). Hence, the theory might be used to explain the need of optimal contractual arrangements between the parties to the conflicts.

In conclusion, a short review of the relevant theories is made above. Incorporating the views of the property rights theory, bounded rationality, incomplete contracts approach in its endeavour to find the *ex ante* and *ex post* contractual relationships, the agency theory is empowered to gain a superior position in giving explanations and solutions to the principal-agent relationships than the rest of the theories. So, this research would use it as the basic theoretical tool even though it might employ other theories as alternative or complementary tools, where appropriate.

4.3. HYPOTHESES FORMULATION

4.3.1 Managerial/ Insider Ownership and Firm Performance

Explaining the agency problem in relation to managerial ownership, Jensen and Meckling (1976) state that the more the share ownership of manager falls, the more is the reduction of manager's residual claims, thus encouraging the appropriation of firm resources in the form of perquisites and demanding more resources for monitoring by minority shareholders. Hence, given the conflict of interests between managers and shareholders, the important question of corporate governance is how to align the interests of both parties properly. Referring to the alignment of interest from the incentive theory point of view, Sappington (1991) suggests that it is necessary to create incentives for the agent in order to align her interest properly to shareholder value maximization. The incentives are expected to motivate managers to make efficient efforts to create total surplus (Jensen & Meckling, 1976).

Theoretically there are two major hypotheses on the impact of managerial ownership to firm value. The *convergence of interest hypothesis*, which links the role of managerial ownership with firm performance (Jensen and Meckling, 1976; Jensen, 1993), proposes that the share ownership of managers would help in aligning the interests of shareholders and managers. However the *entrenchment hypothesis* states that the firm value decreases when management holds a substantial stake in their firms (Jensen and Meckling, 1976; Stulz , 1988; Fama and Jensen, 1983). Stulz (1988) suggests that the value of the firm is positively related managerial ownership for lower fractions of voting rights, and it is negatively related to managerial ownership as the fraction becomes large. Denis et al. (1997) also extends this line of reasoning on nonlinearity. The implication is that the more shares the managers hold, the more is their entrenchment that enables them expropriate the firm's resources to their own benefits, and the more is the reduction in firm performance (Morck et al., 1988; Harris and Raviv, 1988; Stulz, 1988).

The empirical evidence of the studies that investigated the theoretical explanations of the relationship between managerial ownership and firm performance (*Table 4.1*) show mixed results. Using piecewise linear regression, Morck et al. (1988) found that Tobin's Q increases until insider ownership is 5%, then decreases in the range of 5-25%, and then increase beyond 25%. Additionally, Short and Keasey (1999) also report similar alignment-entrenchment pattern for the UK firms using ROE and market value of equity. Moreover, the study on CEO stock ownership by Hermalin and Weisbach (1988) reports similar pattern where Tobin's Q increases between 0 to 1%, decreases in the range of 1%-5%, increases in the range 5%-20%, finally decreases after 20% of CEO ownership.

Furthermore, using quadratic regression model on cross-sectional data, McConnell and Servaes (1990) found that there is a curvilinear relationship between firm performance, measured by Tobin's Q, and insider ownership that is positive until insider ownership reaches 40% and 50%, and negative relation beyond that for both periods. In their piecewise regression, they find significant positive relationship between performance and insider ownership in the range of 0% and 5% only, though they are unable to repeat or confirm Morck et al. (1988) beyond 5% insider ownership. To sum up, the non-monotonous relationship reported support the *alignment-entrenchment-alignment hypothesis*. However, recent studies of Davis et al. (2005) and Florackis et al. (2009) find that there

are more than 2 turning points in the relationship between managerial ownership and firm performance for the UK firms.

Table 4.1: Summary of some empirical studies on the relation between ownership structure and firm performance

Study	Data Type & Methodology	Performance	Ownership
A. Non-monotonic Relationship			
Morck et al. (1988)	Single eq.; piecewise.	Q_T	INO
Hermalin & Weisbach (1988)	Panel data	Q_T	INO
McConnell & Servaes (1990)	Single eq.; piecewise	Q_T, ROA	INO;INSTO; OUTO;
Hermalin & Weisbach (1991)	Panel data; piecewise OLS	Q_T	INO
Short & Keasey (1999)	OLS	Q_T, ROA	INO;OUTO;INSTO
Holderness et al. (1999)	Piecewise	Q_T	INO; CEO_O
Anderson and Reeb (2003)	Simultaneous eq.	Q_T; ROA	INO-FAM;CEO-HIR;CEO_FNDR;FAMO
B. No Systematic Relationship			
Demsetz and Lehn (1988)	Single eq.;Cross-sect. Data	ROE	CC5, CC10, CC20, HI
Denis and Denis (1994)	Single eq.; Cross-sec data	Q_T;ROA	MajO; INSTO
Agrawal and Knoeber (1996)	OLS and 2SLS;	Q_T	INO;BHO;INSTO
Himmelberg et al. (1999)	Simultaneous; Panel data	Q_T, ROA	TopMO
Cho (1998)	Simultaneous equation	Q_T	INO
Mehran (1995)	Single equation	Q_T	INO; OUTO
Demsetz & Villalonga (2001)	Simultaneous equation	ROA;Q_T	CC5; INO
Thomsen et al. (2006)	Simultaneous eq.	Q_T;ROA	BHO
Loderer and Martin (1997)	Simultaneous eq.	Q_T	INO;INSTO;OUTO
C. Positive Relationship			
Weir et al. (2002)	OLS; Logistic regr.	Q_T	CEO_O;OUTO
Thomsen and Pedersen (2000)	OLS	MTBV;ROA	FAMO;GOVO;NFO; INSTO;BANKO
Holderness & Sheehan (1989)	Single eq.	Q_T	MajINO
Agrawal & Mandelker (1990)	Event study	CAR	INSTO;INST_HI5; INO; BHO; CC2
Leech and Leahy (1991)	Simultaneous eq.	ROE;ROS	CC1, CC5, CC10, CC20, etc.
Bethel et al. (1998)	Event study	ROA	INO
D. Negative Relationship			
Cronqvist & Nilsson (2003)	Panel data	Q_T	FAM;CNTRL_O;FINO
Slovin and Sushka (1993)	Event study	CAR	CEO_DEAD;CEO_LIV; INO;INSTO

Source: Literature survey

Notes: *INO* is insiders' ownership or managerial ownership; *MajINO* is majority ownership by insiders; *CEO-O* is CEO ownership; *CEO-HIR* is ownership of hired CEO; *CEO-FNDR* is ownership of founder CEO; *INO-FAM* is family that is insider owner; *TopMO* is top manager's ownership; *CEO-DEAD* is death of CEO; *CEO_LIV* is CEO alive; *MajO* is majority ownership; *CTRL_O* is controlling ownership; *OUTO* is outsiders' ownership; *FINO* is financial institutions' ownership; *INSTO* is institutional investors' ownership; *FAMO* is family or individual ownership; *NFO* is nonfinancial firm ownership; *BANKO* is bank ownership; *GOVO* is state or government ownership; *C1* is stake the first largest shareholder; *CC2* is concentration ratio of the first 2 largest shareholders; *CC5* is concentration ratio of the first 5 largest shareholders; *CC10* is concentration ratio of the first 10 largest shareholders; *CC20* is concentration ratio of the first 20 largest shareholders; *HI* is Herfindahl index concentration; *INST_HI* is Herfindahl index of institutional investors; *ROA* is return on assets; *ROE* is return on equity; *ROS* is return on sales; Q_T is Tobins Q; *MTBV* is market-to-book value; and *CAR* is cumulative average returns.

Some studies that use simultaneous equation specifications (Loderer and Martin, 1997; Himmelberg et al., 1999; Demsetz and Villalonga, 2001) show no systematic effect of insider ownership on firm performance. Accounting for endogeneity and using OLS and simultaneous regression models, Agrawal and Knoeber (1996) also find no systematic relationship between managerial ownership and firm performance. Additionally, even not accounting for endogeneity, Mork et al. (1988) that use linear regression show no significant relation between ownership and performance like Demsetz and

Lehn (1985), who assume endogeneity of ownership structure. Moreover, Himmelberg et al. (1999) even by accounting for endogeneity and making attempts to mitigate the unobserved heterogeneity problem in analyzing the panel data of 1982-1992 find no systematic effect of insider ownership on firm value complicates the comprehension of the clue for reasons of the mixed results more. However, Weir et al. (2002), including lagged performance as explanatory variable to account for endogeneity, show evidence of alignment of interest hypothesis or the positive link between CEO ownership and firm performance.

In this research, managerial ownership is defined as the percentage of share ownership of both executive directors that run the operation of the firm, and non-executive directors in line with Morck et al. (1988), McConnell and Servaes (1990) and Short and Keasey (1999). Recognizing that nonexecutive directors are not managers involved in the day-to-day management activities of the firm and the delimitation of the failure to separate them, this research assumes that they are part of the management body in the boardroom of the one-tier system, and hence, all directors have the incentives to exert control because directors are also blockholders or their representatives (Holderness, 2003; 2007).

Finally, though the alignment-entrenchment-alignment hypothesis suggested by Stulz (1988) says that there is nonlinear relationship between insider ownership and performance, we test the following basic hypothesis considering the alignment of interest hypothesis.

> ***Hypothesis 1:*** *There is a positive relationship between managerial ownership and firm performance.*

4.3.2 Outsider Ownership and Firm Performance

Literature shows that outsider shareholders, namely institutional investors, non-financial corporations, individuals (family), banks and state might have the incentive and ability for monitoring or controlling management or insiders and influence firm performance. It is hypothesized that the large shareholders might undertake monitoring or might exert control pressure on management motivated by shared or private benefits of control (Holderness, 2003).

The *shared benefits of control hypothesis* are the unintended beneficial consequences of the self-interested behaviour by blockholders. Motivated by shared benefits of control, external blockholders might have the ability to appoint (independent) directors or the advisory vote on executive pay packages. Regarding their monitoring role, Grossman and Hart (1988) suggests that the external large shareholders monitor their firm by bearing the monitoring costs, whereby their share of benefits will be proportionate to their cash flow rights (dividends or capital gains). That means the benefits of the monitoring accrue to all shareholders equally proportional to the cash flow rights. Holderness (2003, p.54) notes that with the rise in blockholder stake, other factors kept constant, their incentive to increase firm value increases due to the superior management and monitoring motivated by the shared benefits of control. Counter argument to the view of the shared benefits of control is the *free-rider hypothesis*, which asserts that small shareholders free-ride by not bearing the monitoring costs and that the proportionate benefits of monitoring might discourage large shareholders to bear the monitoring costs alone. Hence, the free-rider problem might suggest either positive or negative relationship between external blockholders and firm performance

depending on the discretion of the blockholders to bear the costs in order to exert control or monitoring pressure on the management.

On the other hand, the *private benefits of control hypothesis*, developed from the modelling device used by Grossman and Hart (1980), suggests that external blockholders are motivated by the private benefits of control that do not accrue to small shareholders (Holderness, 2003). Holderness (2003) suggests that blockholders assemble large blocks of shares in order to enjoy private pecuniary benefits among other things. Hence, it is arguable that private benefits of control might not harm minority shareholders. Another viewpoint regarding the relationship between large shareholders and minority shareholders which is related to the private benefits of control is the *expropriation hypothesis*. The hypothesis suggests that large shareholders may even induce another type of agency costs driven by the private benefits of control at the expense of other shareholders or stakeholders (Shleifer and Vishny, 1997; La Porta et al., 2000). This might suggest the negative impact of large shareholders on firm performance. Hence, the expropriation hypothesis has a large overlap with the private benefits of control in this case. However, the diversity of interests among large shareholders, and the characteristics and behaviours of different large blockholders might mean the possibility of both positive and negative relations between them (Pound, 1988). Moreover, Shleifer and Vishny (1986) suggest that potential takeover threat that can be exerted by large blockholders may work as an effective device to monitor management and affect firm value positively. However, it is also arguable that the minority shareholder protection and the fiduciary duties of directors are important factors that might influence the ability of outsider blockholders to expropriate minority shareholders.

However, there are two arguments worth to mention regarding the value and welfare effect of the monitoring costs by large shareholders. Holderness (2003) argues that the monitoring costs borne by large shareholders for private benefits of control might not have any impact on the wealth of minority shareholders. Though the control may give some benefits, it is argued that there are also costs of non-diversification of the controlling blockholders, for instance, risk-diversion and over-diversification to minority shareholders (Dyck and Zingales, 2004). Regarding the costs of monitoring, Holderness (2003) suggests that sometimes the net private benefits of control are negative in some firms.

In this study, we investigate the relationship between the external (outsider) ownership categories, namely institutional investors' ownership (INSTO), nonfinancial firms' ownership (NFO), family or individual ownership (FAMO), bank ownership (BANKO), state or government ownership (GOVO) and firm performance. We also analyze the association of the aggregate ownership of all external block ownership (OUTO) and firm performance. It is also worthwhile to note that we are not investigating the role of a single blockholder but the aggregate of single blockholders that are in the same category assuming that it might be easier for similar blockholders with common characteristic features and behaviour to form coalitions in order to gain the ability to exert control pressure. The role of all external block ownership is also considered in the analysis assuming that there might be a possibility that the external blockholders from different categories might form coalition to exert control pressure.

The empirical evidence shows that the results on the impact of external blockholders and firm performance are rather mixed. Relating to the theoretical frameworks stated above, McConnell and

Servaes (1990), and Weir et al. (2002), report evidence that external blockholders have negative impact on firm performance. There are also empirical sources that support the existence of shared benefits of control (Shleifer and Vishny, 1986; Leech and Leahy, 1991); and suggest that blockholders or their representatives usually serve as directors or officers. It follows therefore that blockholders are in a position to influence decisions directly and boost profitability, which is shared by all shareholders. There is also evidence that the formation of share blocks is associated with abnormal stock price increases (Mikkelson and Ruback, 1991). Furthermore, Barclay and Holderness (1991) show evidence that trades of large blocks are associated with abnormal stock price increases.

Study on the US by Shleifer and Vishny (1986) and on the UK by Leech and Leahy (1991) show that there is a positive relationship between outsider ownership and performance. McConnell and Servaes (1990) also show evidence of significantly positive relationship between institutional ownership and firm performance even after adjusting for industry differences. Relating to the differences of interests among different categories of external shareholders, Barclay and Holderness (1991) suggest that the strength of the positive link depends upon the behaviour of each blockholder. Regarding bank ownership, Gorton and Schmid (2000) find that bank influence enhances firm performance. However, Yafeh and Yosha (2003) show that banks holding a large equity stake in Japan do not limit management private benefits, which reduce profitability. Supportive to this evidence, Chirinko and Elston (2003) provide evidence that bank control has insignificant negative effect on firm profitability for Germany.

On the other hand, the study of US firms by Denis and Denis (1994), Mehran (1995), and Loderer and Martin (1997), and UK firms by Short and Keasey (1999) and Weir et al. (2002) show evidence of no significant or systematic relationship. Additionally, Kaplan (1994) and Frank and Mayer (2001) find that there is no significant effect of outside owners' control on firm performance for German listed firms. Moreover, recently Thomsen et al. (2006) find no significant relation for the US-UK firms and negative association for firms in Continental Europe between external blockholders and firm value. Using simultaneous regression, Agrawal and Knoeber (1996) find also no systematic relation between outsider ownership and institutional ownership and performance.

However, literature shows that there are few studies that show negative relationships. Edwards and Weichenrieder (1999) and Dyck and Zingales (2004) provide evidence of private benefit of control of external shareholders at the expense of minority shareholders. This might suggest that they might indulge in maximizing their own utility, thus raising the question of the agency problem: *Who monitors the controlling external shareholders (the monitors)?*

Hence, though we bear in mind that the expropriation hypothesis suggests otherwise, we test the following basic hypothesis based on the monitoring hypothesis related to the shared benefits of control.

> ***Hypothesis 2:*** *A positive relationship exists between external ownership categories or their aggregate ownership and firm performance.*

4.3.3 Board Structure

The board of directors is the 'apex' of a corporation's control systems with the primary role of monitoring management on behalf of shareholders, the power to hire, fire and compensate top-level managers, to ratify and monitor important decisions (Fama and Jensen, 1983; Gillan, 2006) and ensuring whether the executive directors are pursuing the interests of shareholders or not. According to Fama (1980), it is viewed as a market-induced institution with the ultimate power to monitor the firm and the role to scrutinize the firm's highest decision makers. From the agency theory perspectives, the role of the board is to provide a lower cost device than other governance mechanisms like takeover market for solving agency problems like replacing or reordering top managers (Fama, 1980). The property rights theory, however, suggest insightfully that the inside and outside markets of managers have roles in disciplining management (Alchian and Demsetz, 1972). Furthermore, the resource dependency theory sees the board of directors as co-optative mechanisms with the role of matching the firm with the environmental demands (Aguilera, 2005).

Theory suggests that board independence, where the nonexecutive directors are generally expected to be independent from the top management led by the CEO, is important (Monks and Minow, 2004). As a solution to the conflict between the CEO and the board in general, Fama and Jensen (1983) suggest that the majority of the boards should be non-executive directors (NEDs), who are assumed as independent and can act as arbiters in disagreements among top executives and search for the replacements of the internal managers. Hermalin and Weisbach (1998) suggest that as board independence increases the directors' willingness to monitor the CEO increases. Hence, the directors should maintain their independence in order to be able to effectively monitor and to replace poorly performing top management. Hermalin and Weisbach (2003) propose the board model as the bargaining framework, where board structure is the outcome of the bargaining process between managers and outside directors. They suggest that the major conflict within the boardroom is between the directors and the CEO since the CEO has the incentives to control the board in order to keep her job and increase the benefits of being the CEO.

Nevertheless, in a setting, where the boardroom is composed of executives to run the day-to-day operation of the firm and nonexecutives to monitor executives, the important research issue regarding the board would be: *how to attain the effectiveness of the board as an internal monitoring control device.* Affirming the importance of this issue, the Combined Code (2003) in the UK provides recommendations that most of the board member should be nonexecutive directors (NEDs), that the board should not be so large but sufficient size with the balance of skills and experience, and that roles of the CEO and the Chair should be separated (splitting CEO-duality) as elements of corporate governance reforms. Hence, the proportion of nonexecutive directors (PNED), board size (BSIZE) and CEO-duality (DUAL) are chosen as variables for board structure.

However, the problem with this is that all NEDs might not be independent but they might be classified as inside nonexecutive directors and independent (outside) nonexecutive directors. Since only outside independent (not affiliated) NEDs might be independent of the CEO, the *NED* representation in the boardroom*,* measured by the proportion of nonexecutive director members, cannot be the perfect measure of board independence. Hence, the Code of Best Practice (2006) stresses the independence of NEDs by recommending some test criteria for ensuring true independence. Therefore, this research is delimited in incorporating some other provisions of the

Code like board independence and subcommittees because only objectively and directly measureable board variables are sought so as to avoid measures that involve subjective discretions on the independence test criteria which might be a source of bias. Hence, it is vital to note that the research study is not exclusively on the compliance to the Codes of Best Practice.

4.3.3.1 NED Representation

Hence, according to the agency theory, the NEDs are assumed to be important monitors that supervise and control the executives. The popular perspective on the monitoring role of the board structure is that non-executive directors (NEDs) are better positioned than executive directors to carry out the monitoring function since they are presumably independent and more concerned for their reputation in the labour market (Fama and Jensen, 1983). Fama (1980) and Fama and Jensen (1983) suggest that NEDs in the board add firm value by providing expert knowledge and monitoring services. Based on the resource dependency theory, it can be argued that the NEDs might contribute to the profitability of firm performance in terms of their expertise by giving advice the management on strategic plans and investments, and in terms of their reputational integrity by enabling the firm to have network relationships with the community and other stakeholders. From these perspectives we expect a positive causal relationship between board independence and firm performance.

On the contrary, there is an alternative perspective suggesting that insider directors are better equipped to undertake monitoring function than the nonexecutive directors since they possess superior information that enables them evaluate top managers (Baysinger and Hoskinsson, 1990). Contrast to this argument is that the NEDs are usually part-timers and this limits the extent of their monitoring, and that they lack all the complete information necessary for making decision (Bozec, 2005). From this perspective, the NEDs representation would have a negative impact on firm performance.

Though the theory suggests that nonexecutive directors' representation enhances firm performance, the empirical evidence shows mixed results. Baysinger and Butler (1985) provide some evidence of better performance of firms with more representation of outside directors by using ten years lags of the variables. Additionally, Coughlan and Schmidt (1985) and Hermalin and Weisbach (1988) provide evidence of the argument that non-executive directors are effective monitors and a disciplining device for managers. Referring to the ways of playing the monitoring role, Weisbach (1988) finds that outsider directors may enhance firm value through their role in dismissing inefficient and poorly performing management. Other strong support for the positive relationship comes from the event study of Rosenstein and Wyatt (1997) and Shivdasani and Yermack (1999), which show evidence of increases in firm value with the appointment of non-executive directors. Moreover, the cross-country study of Dahya et al. (2008) shows evidence of significant positive relation between firm value and the percentage of directors not affiliated with the dominant shareholders in countries with weaker legal shareholder protection.

On the contrary, for the US firms Yermack (1996) and Agrawal and Knoeber (1996), and for the UK firms Weir and Liang (1999) provide evidence of negative relationship between the representation of independent directors and some performance measures. Recently, Bozec (2005) also provides evidence of negative relation between board independence, proxied by PNED, and firm profitability and productivity for state owned firms exposed to market discipline.

Moreover, empirical evidence on same year data analysis from Baysinger and Hoskinsson (1990) and Hermalin and Weisbach (1991) show results of no relationship between board composition and performance. Additionally, Barnhart and Rosenstein (1998) also provide a weak evidence of a curvilinear relation between the proportion of outside directors and firm performance.

The first explanation for the ambiguous empirical results of the relationship between board independence and firm performance shown above is that it might be influenced by the presence of endogeneity of board structure (Hermalin and Weisbach, 2003). Another explanation might be the substitution effect of internal or external control structures like proportion of insiders, insider ownership, leverage, and/ or takeover market (Walsh and Seward, 1990; Agrawal and Knoeber, 1996; Bozec, 2005), and dominant shareholders (Dahya et al., 2008). Finally, the ambiguity of the results may be attributed also to the fact that board structure evolves and develops dynamically over time (Hermalin and Weisbach, 2003; Hillier and McColgan, 2006) and it may be difficult to identify the insignificant effect of a particular time.

However, considering the monitoring hypothesis of the agency theory that outsider directors' representation gives strong position for the boards to monitor executive managers and the resource dependency theory, the hypothesis this research would test is:

Hypothesis 3: *The proportion of NEDs is positively associated with firm performance.*

4.3.3.2 CEO-Duality

According to the agency theory, it is difficult to control the boards dominated by executive directors (Fama and Jensen, 1983). One way of domination of the board by the EDs is when the CEO assumes also the role of chairman, which is termed as CEO-duality. With CEO-duality the CEO has the ability to become entrenched because the Chair has the role of setting the board's agenda and facilitating access to information. Hence, duality will lead to the entrenchment of the CEO or executives and curbs the independent directors' ability to monitor. This suggests that a negative relationship between duality and firm performance is expected. So, in order to ensure board independence split of duality is recommended. Separation of the roles of CEO and chairmanship demarcates the boundaries between the monitoring function of the outside directors and management's decision control function (Fama and Jensen, 1983). In contrast, duality can be an advantage to the firm since it may provide a unified leadership of the firm that facilitates greater understanding and knowledge of firms operations and better decisions. This may impacts positive effect on firm performance.

However, research has not yet produced enough supportive evidence on the two views. Boyd (1995) provides evidence that duality leads to better performance. Contrast to this, the negative impact of duality on performance is not supported empirically. Studies on US by Dalton et al. (1998) and on UK by Weir and Liang (1999) show evidence that duality does not harm nor improve performance.

Anyhow, considering the agency model perspective on duality and the recommendation given in the Code of Best Practice on separation of the CEO and Chairmanship roles, this research would test the following hypothesis.

Hypothesis 4: *There is an inverse association between CEO-duality and firm performance.*

4.3.3.3. Board Size

The notion regarding board size is that the problems of poor communication and decision-making overwhelm the effectiveness and the performance of large boards (Lipton and Lorsch, 1992; Jensen, 1993). Lipton and Lorsch (1992) argue about the dysfunctional behaviour of large boardroom, where directors rarely criticize policies of top managers or discuss candidly on firm performance. They recommend lower board size in contrast to the view that board capacity to monitor increase with its size. Jensen (1993) suggests that it is more costly for large boards to monitor growth firms and that large boardroom is less likely to have effective functioning when its size is beyond 7 or 8 people. The agency model suggests that as board size becomes bulk, the agency problem related to director free-riding increases and "the board becomes more symbolic and less a part of the management process" (Hermalin and Weisbach, 2003, p13). The bulk size might have the negative impact on performance by reducing the monitoring and control role of the board and letting managers loose to pursue their own interests not aligned to that of shareholders.

Yermack (1995) found a negative relation between board size and firm value measured in Tobin's Q. The convex shape suggests that the largest fraction of lost value (high incremental costs) occurs as boards grow from small to medium size. Eisenberg et al. (1998) also provide similar evidence. However, this is contested partially by Faccio and Lasfer (1999) who show evidence that UK firms above the median board size level exhibit higher firm value.

Nevertheless, the trend of board size is that it has been decreasing with time, indicating the acceptance of better performance of small boards in the perception of market participants (Hermalin and Weisbach, 2003). So, considering the free-rider view related to the agency problem of board size and the evolution of board size over time, this research would test the following hypothesis.

Hypothesis 5: *There is a negative relationship between board size and firm performance.*

4.3.4 Debt Financing

The agency perspective about debt financing is that it is one of the governance mechanisms that mitigate the agency costs and aligns the interests of managers with that of shareholders. Regarding this, Grossman and Hart (1982) and Jensen (1986, 1993) argue that higher leverage is used as a bonding device, and the fixed repayment of committed debt constrains management's access to free cash flow that tempts them to invest on projects that have a negative net present value. This mitigates the agency conflict since it curbs managerial shirking and raises their effort and it reduces management's discretion to consume excessive perquisites, thus leading to increase in firm value (Jensen and Meckling, 1976, Grossman and Hart, 1982). Hence, the view on the effect of leverage in aligning the interest of management with that of shareholders due to the risk of bankruptcy costs in case the firm defaults on its debts and limiting the misuse of company assets due to lack of free cash flow suggests that leverage has positive impact on firm performance.

The counter argument to the monitoring role and value enhancing effect of debt is that most firms can still easily meet their interest payments and principal repayments on their debt obligations and that they rely on internal financing (Allen and Gale, 2000). This may tempt managers to be engaged in shirking or enjoying perquisites, thus reducing firm value. Additionally, excessive use of debt may

increase risk and thus have negative impact on value beyond the optimal capital structure level (where marginal cost of debt is equal to its marginal benefits) due to the agency costs of debt including underinvestment and financial distress (bankruptcy costs). Stulz (1990) argues that as it may reduce the risk of overinvesting, debt has also a danger if it leads to underinvestment due to the cost of raising new finance. So, the financial distress related to debt would explain the negative relationship between debt and firm value. However, the empirical evidence on the positive impact of leverage on firm value is not conclusive.

Using simultaneous model, Agrawal and Knoeber (1996) and Demsetz and Villalonga (2001) provide significant negative effect of debt financing on performance for US firms. Seifert et al. (2005) find also significantly negative relationship between leverage and performance for US, UK and German (insignificantly negative for Japan) firms. Weir et al. (2002) find negative relationship between leverage and firm performance on UK firms. However, using lagged dependent variable in the OLS regression, leverage retains negative effect but significant only at 10% level. In contrast to these findings, Short and Keasey (1999) find significant positive relationship between leverage and performance, measured in market value of equity, for UK firms. In conclusion, the empirical evidence in support of the agency perspective of positive relationship between leverage and performance is not enough. Moreover, the negative relationship is not backed with strong theoretical explanation.

However, considering the theoretical framework on creditor monitoring even though the theory of financial distress suggests the opposite, this research would test the following hypothesis.

Hypothesis 6: *Debt finance is positively associated with firm performance.*

4.3.5 Takeover Market

The takeover market is a special part of the secondary market of shares (stock markets). It is also called market for corporate control, which provides a conduit or means for effective internal (firm's shareholders) or external control that results in takeovers via large acquisitions of company stocks that leads to change in control or mergers and acquisitions (M&As). Moreover, the competition for control inherent on the market might induce hostile takeover, where rival management teams to try to win control over the management of the target shareholders or firms.

The popular view on takeovers, which is in line with the agency perspective, suggests that motivation of takeovers is to discipline the target firm, where the inefficient management team is replaced by efficient managers pursuing shareholders benefit (Grossman and Hart, 1980; Jensen, 1988, Morck et al., 1989). Takeover market, which is described as a disciplining mechanism of the last resort (Jensen, 1986), plays the external monitoring role either by the tender offer or the proxy fight in order to control the decision process of the poorly performing firm and circumvent the existing top managers and the board (Fama and Jensen, 1983). The other motives of takeover are: (1) to exploit synergy in production (economies of scale and scope), and (2) to control another company (Powell, 1997; Tuch and O'Sullivan, 2007; Hodgkinson and Partington, 2008).

The market has the impact of initiating actual or potential investors to pay a premium on the share prices for the current owners and seek the opportunity to improve the performance of the firm by improving the quality of the management. It is suggestive that takeover market might influence firm

performance by posing threat to dismissals or replacement of the underperforming management team with a more active one. The threat of takeover might create incentives on managers to put more efforts to increase profitability of the firm. It is arguable that the threat takeover intensity in the industry might put pressure on the incumbent management to high performance level in order to avoid hostile takeover from the rival management team of the competitors in the industry. Hence, takeover intensity in the industry is chosen as the proxy for takeover market. Takeover intensity or likelihood is used as a control variable because in industries in which there are comparatively many (hostile or friendly) takeovers, mounting a hostile takeover is likely to be easier than in industries in which any type of takeover is rare. We would like to note that takeover intensity can be a proxy for (1) stock market in general when we refer to internal friendly takeover resulting from large acquisitions of company stocks in the stock market or internal proxy offer, and (2) hostile takeover both of which result in the takeover of the control of the firm. Hence, according to the argument, it is expected that takeover intensity has positive association with firm performance.

The empirical evidence on the direct relationship between takeovers and performance are mixed. Weir et al. (2002) report positive relationship between the likelihood of takeovers and firm performance, thus supporting the agency perspective of the monitoring role of takeover market. However, Agrawal and Knoeber (1996) find that greater corporate control activity is inversely associated with performance. Their interpretation is that the result may be influenced by other governance mechanisms. Moreover, Agrawal and Knoeber (1996) suggest that greater institutional ownership, non-executive directors' representation, and greater insider ownership (who may gain from stock price appreciation) might facilitate takeovers, thus indicating the substitution effects among governance mechanisms.

Nevertheless, given the suggestion of the agency perspectives that the motive of takeover is to discipline poorly performing managers, there is the *takeover intense* (a proxy for takeover market) that creates incentives in the managers to work hard so as to improve firm performance. Therefore, the hypothesis tested in this research is states as follows.

> ***Hypothesis 7:*** *There is a positive relationship between the takeover intensity and firm performance.*

4.4 METHODOLOGY

4.4.1 Sample and Data

The research uses a sample made from UK listed companies that are in the FTSE ALL SHARE Index, which is a fitting sample for the UK listed firms because it is the broadest index that includes smaller and largest listed firms and represents about 98% of the UK market capitalization (FTSE Factsheet, 2008). The ownership, directors, and accounting or financial data on the firms in the Index is collected for period 2003-2007. The period is chosen because it begins with the year the Higgs Report (2003) and Combined Code on Corporate Governance (2003) were published and the UK economy showed recovery after the financial crisis and corporate scandals of the beginning of the millennium, and it ends with eve of the recent global financial crisis. Hence, it is sought to provide recent empirical evidence on the link between ownership structure and firm performance during the period.

The ownership and directors' data are collected manually from the Waterlow Stock Exchange Yearbook based on the list of 665 firms in the FTSE ALL SHARE Index provided electronically from DataStream in April 2008, which is found to give the same lists of active and inactive firms for 2003-2008 and assuming end of the UK firm year as 31 March. For each firm in the Index and for every year, the data is constructed by registering the blockholders owning at least 3% share and their stakes, the number of nonexecutive directors, board size and CEO-duality. Even though, it is inevitable the results might be different if higher thresholds are used as shown by La Porta et al. (1999), Franks et al. (2001) and Marchica and Mura (2005), we use 3% cut-off following the recent works of Short and Keasey (1999), Weir et al. (2002), Dahya and McConnell (2002), and Florackis and Ozkhan (2009) who used the same blockholder ownership criteria. Furthermore, the financial or accounting data are collected electronically from DataStream. However, the inputs to the calculation of takeover intensity, which is the proxy for takeover market, are collected from Thomson One Banker. The accounting data are finally merged with the separate ownership and directors' data.

Initially, the data of ownership for significant owners holding at least 3% is and the board structure variables are collected for the active firms. The ownership data is checked twice during collection in order to avoid significant errors. Then the blockholder category for each significant shareholder is identified and the aggregate ownership of each blockholder category is calculated for each firm. Since only those members of the Index whose ownership data is available on the Waterlow Stock Exchange Yearbook are collected for the period 2003-2007. This provided the potential omissions of observations for inactive firms for each year due to missing data. In the exclusion process, firstly, the companies in the Index that lack both the ownership data and all of the performance variables are removed. Secondly, those lacking data mainly on ROA, ROE and at least one of the other valuation based performance variables (that have less missing values than ROA and ROE) are removed from the data set. This is done to allow for the ownership variables missing values for few firms also as there are missing values for performance or other explanatory variables.

Finally, the final unbalanced panel data retained has a total of 2883 firm-year observations. This is sought to retain the real contents of the information as much as possible since further deletions would distort the information and might create artificial data that might be far from reality. The

financial and regulated companies are retained in the sample because econometrical tools provide ways of controlling their effects.

4.4.2 Description of Variables

Performance variables: The most extensively used performance measures in empirical studies are Tobin's Q, ROA and ROE. The popular Tobin's Q is left out because the raw data for calculating the replacement cost (RC) of assets for UK is difficult to find since it is not reported in most of European countries (Goergen and Renneboog, 2001). However, since the performance of a firm can be manifested in the market value of the firm, the quasi Tobin' Q or market/book value (MTBV) and price/ earnings ratio (PER) are used as the valuation measures of performance. This is sought to enable the research to find out the difference between the accounting (financial) and value based measures. *Table 4.2* presents the performance variables that are used as dependent variables and their lags (corresponding values in the previous year) that are used as control (explanatory) variables.

Table 4.2: Performance variables and their descriptions

Symbol	Variable name	Descriptions and measures
Performance variables : Dependent variables		
ROA	Return on assets	Net income over total assets
ROE	Return on equity	Net income over shareholders' equity
MTBV	Market/Book value	The ratio of market value to the book value of the firm
PER	Price/Earnings ratio	The ratio of stock prices to earnings per share
Lagged performance variables: Control (explanatory) variables		
ROAt1	Previous ROA (ROA_{t-1})	Return on assets in the previous year
ROEt1	Previous ROE (ROE_{t-1})	Return on equity in the previous year
MTBVt1	Previous MTBV ($MTBV_{t-1}$)	Market to book value in the previous year
PERt1	Previous PER (PER_{t-1})	Price earnings ratio in the previous year

It is arguable that accounting and market data have some things in common (related) and have difference. The accounting data are just the raw data as disclosed by firms to be available to users, especially investors, or that are computed from other raw accounting data. The two data are related because the investors use the accounting data and additionally other information in their valuation of the firm by making expectations of the future and this yields market data. Hence, market data is influenced, for example, by investors' perception about growth prospects, the quality of corporate governance and management but also the reliability of accounting data published by the firm. Hence, it might be suspected that the there might be a low correlation between the dependent market based performance and accounting explanatory variables due to the non-accounting information used in making expectations of market data.

Ownership structure variables: The potential blockholder categories that are aggregates of single or identifiable block owners at 3% definition criteria and included as ownership variables are (1) insider ownership (INO), (2) institutional ownership (INSTO), (3) nonfinancial firms' ownership (NFO), (4) family or individual ownership (FAMO), (5) Bank ownership (BANKO), (6) state (government) ownership (GOVO), (7) outsider ownership (OUTO), and (6) all blockholders' ownership (ABHO). *Table 4.3* presents the symbols and the definition of the ownership structure variables. The blockholder categories to which each substantial shareholder belong to could be known since they are institutions, banks, individuals, trust, trustees, governments (national or local) and families that are identifiable from the FTSE industrial sector and the descriptions of 'activity' in the Yearbook. This is double-checked by using the London Stock Exchange listings of member companies that reveal some owner types and from Internet search on the websites of Companies House and UK Data.

Table 4.3: Summary of the definition and descriptions of ownership structure variables

Symbol	Descriptions and measures
INO	Insider ownership; the sum of ownership of executive and nonexecutive directors
INO2	Insider ownership squared; the sum of ownership of executive and nonexecutive directors squared
INO3	Insider ownership cubed; the sum of ownership of executive and nonexecutive directors cubed
INSTO	Institutional ownership; Proportion of aggregate blocks of at least 3% of the firm's outstanding shares held by all institutional investors.
NFO	Nonfinancial firms' ownership; Proportion of aggregate blocks of at least 3% of the firm's outstanding shares held by non-financial corporations.
FAMO	Family or individual ownership; Proportion of aggregate blocks of at least 3% of the firm's outstanding shares held by family, individuals or related.
BANKO	Bank ownership; Proportion of aggregate blocks of at least 3% of the firm's outstanding shares held by deposit accepting banks.
GOVO	State (national or local government) ownership; Proportion of aggregate blocks of at least 3% of the firm's outstanding shares held by state or governments.
OUTO	Outsider ownership; Proportion of the aggregate blocks of at least 3% of the firm's outstanding shares held by institutional investors, non-financial firms, family or individual, banks and government .

Governance Mechanism and Control Variables: The governance mechanism variables used are proportion of NEDs, duality, board size, takeover intensity (TOINTENS) as a proxy for takeover market and leverage ratio (TDTA) as a proxy for debt financing *(table 4.4)*. The firm specific attributes are controlled using PVOL (stock price volatility), TA (total assets for firm size), AGE (firm age), RNDTS (R&D to sales ratio), SGATS (Sales, General and Administration Expense, which includes advertisement expenses and marketing and promotion costs, to sales ratio), FATS (fixed assets to sales ratio), and industry dummies.

Following Morck et al. (1988), McConnell and Servaes (1990), Denis and Denis (1994), Keasey et al. (1994), Mehran (1995), Kole (1995), Short and Keasey (1999), Holderness et al. (1999), and Demsetz and Villalonga (2001), we control for *debt ratio*, which is measured as ratio of the book value of long-term liabilities to total assets. It is expected that debt financing disciplines managers by limiting the free cash flow and reducing profit diversion, hence increasing firm value. It can also be argued that the increase in debt ratio has a negative effect increasing the risk of financial distress and

bankruptcy (Maury and Pajuste, 2005). Hence, there is no clear prediction of association between debt ratio and firm performance.

Table 4.4: Governance mechanism and control variables

Symbol	Variable name	Descriptions and measures
Panel A: Governance Mechanism Variables		
BSIZE	Board size	The sum of executives and non-executive directors.
PNED	NED representation	Board independence proxy, which is measured as the number of non-executive directors over the number executive directors.
DUAL	CEO-Duality	Duality takes the value 1 if the CEO sits on the board as Chairperson, 0 otherwise
TOINTENS	Takeover intensity	The number of firms in the firm's industry acquired during the previous period over the number of firms in that industry sector.
TDTA	Debt ratio	Debt financing (leverage ratio), measured as the ratio total debt to total assets of the firm.
Panel B: Control variables		
PVOL	Stock price volatility	Stock price volatility, proxied by volatility rating. It is calculated on standard deviation of the price divided mean price and the whole multiplied by 40 to make it in scale 1-20.
TA	Firm size	The book value of total assets.
AGE	Firm age	The age of the firm since incorporation.
RNDTS	R&D intensity or ratio	Research and development intensity (R&D ratio), which is measured as the ratio of annual R&D expenditure to total assets.
SGATS	Advertisement intensity or ratio	Advertisement ratio (AD ratio), which is proxied by the ratio of Selling, General and Administration Expenditures (SGA) less R&D expenditure to total sales.
FATS	Fixed asset ratio	Fixed assets intensity (FA ratio), which is measured as the ratio of total annual expenditures on fixed assets to total sales.
INDUSTRY	Industry dummies	(0) Firm is *Finans*, which takes the value of 1 if the firm is in the financial and real estate or property services sector, or 0 otherwise; (1) Firm is *Energy,* which takes the value 1 if the firm is in energy or utility sector, or 0 otherwise; (2) Firm is *Medias,* which takes the value 1 if the firm is in the media, entertainment, hotels or leisure sector or 0 otherwise; (3) Firm is *ITS*, which takes the value of 1 if the firm is in the high technology and communication sector, or 0 otherwise; (4) Firm is *Consults*, which takes the value of 1 if the firm is in the consultancy services sector, or 0 otherwise; (5) Firm is *Industs,* which takes the value 1 if the firm is in the industrial, manufacturing and related sectors or 0 otherwise;

Additionally, in the regime of high minority investor protection right in the UK, we control *takeover intensity (TOINTENS)* as a proxy for the limit of a blockholder's ability to exploit minority shareholders and monitoring role in limiting the behaviour of management diversion from shareholders' interests. TOINTENS is calculated as ratio of the number of firms in the firm's industry acquired during the previous period over the number of firms in that industry sector. It is expected that firm performance increases with the increase TOINTENS since the monitoring effect of takeover might induce the incentives to make more effort to the profitability of the firm by management to avoid the risk of replacement.

Moreover, the control variable related the firm's equity pricing and its price movement in the stock market is price volatility (PVOL). PVOL is the proxy for corporate risk in the market. The data comes directly from DataStream database, and it is calculated on standard deviation of the price divided by mean price and the whole multiplied by 40 to make it in scale 1-20. It is expected that firm performance decreases as PVOL increases.

Following other researchers (Agrawal and Knoeber, 1996; Holderness et al., 1999; Demsetz and Villalonga, 2001), we control for *firm size*, which is measured as the total assets. It is expected to have negative association with firm performance since the more matured firms are, the less their profitability is because larger firms will gradually be in a more mature stage of their life cycle (Maury and Pajuste, 2005). The same argument applies to *firm age* because older firms have less dynamism (Gutierrez and Pombo, 2009).

Furthermore, *R&D to sales* is the ratio of R&D expense to sales. Since the increase in the expense has the effect on reducing the profits, it is expected that R&D to sales has a negative association with firm accounting performance (Demsetz and Lehn, 1985; Denis and Denis, 1994). However, it might have a positive impact on market based performance since investors might use the R&D expense as the information for future growth prospect of the firm.

Additionally, SGATS is a proxy to accommodate the *advertisement intensity* since its appropriate measure, advertisement expense to sales ratio or advertising expense is not available on DataStream. It is also considered as the agency cost for firms (Florackis and Ozkan, 2009) because it includes the administrative costs that might consist of managements' consumption of perquisites. SGATS does not include R&D expenses, and it can be considered as a good proxy for advertisement ratio since it includes marketing and promotion expenses, while also serving as the source of the agency costs to the firm. Since the expenses increase costs to the firm, SGATS is expected to have a negative impact on firm performance (Singh and Davidson, 2004; Florackis and Ozkan, 2009).

Finally, this research also uses *fixed assets ratio*, measures of asset tangibility, which is measured as the total expenditure on fixed assets (plant, property and equipment) divided by total sales instead of total assets as another control variable. Following Demsetz and Lehn (1985), Himmelbjerg et al. (1999) and Demsetz and Villalonga (2001), we chose this variable considering that the expenses on the current costs on fixed assets might have negative impact on current firm ROA.

The industry dummies are: energy and utility (ENERGY); media, leisure and entertainments (MEDIAS); high technology and telecommunication (ITS); consultancy and non-product industry services (CONSULTS); banks and institutional investors (FINANS); and manufacturing, industrials, staples, consumer products, etc (INDUSTS). The industrial classification is first collected from Waterlow Stock Exchange Yearbook together with the ownership and directors' data. The industry sectors of the FTSE, which is coded in numbers and described in words, could clearly provide to which industry a firm belongs, and cross checks are made for some especially in the services in order to ensure their placements based on the main business undertakings. Even though there are about nine industry sectors according to FTSE classification, they are regrouped into six categories in order to avoid many dummy variables that would inflate the number of explanatory variables that are already considerably high and hence to have lower degrees of freedom in our estimation and tests.

4.4.3 Data Analyses and Model Specification

4.4.3.1 Data Analyses and Management

After careful examinations of possible problems related to data features, the following data management decisions are taken concerning data levels, missing values (MVs), unbalanced or non-rectangular framework, outliers, and normality.

Firstly, as for the ***data levels***, since most of the variables in the data are measured as percentage and proportions (continuous), and few are in discrete nominal and binary scale of 0 and 1, the use of parametric methods of analyses can still be ideal to ensure the actual standard errors and significance. It is decided to avoid any transformation of the data in order to adjust to parametric methods.

Secondly, regarding the ***missing value,*** it is decided not to use imputation or deletion since they occur completely at random (MCAR) and they are more than 5% of the original sample. This is chosen because imputation or deletion is believed to greatly affect the ideal or proper sample size severely and change the nature of information on the state of things, thus creating artificial data, which leads to incorrect interpretations regarding the population. The retention of the MVs would also help us to retain more firms and thus a representative sample.

Thirdly, the ***unbalanced nature of the panel data*** arises from allowance of missing variables and the use of different dependent performance variables. The data is retained to preserve the actual information since the problems arising from unbalanced nature of the data, mainly heteroscedasticity or autocorrelation, can be handled by appropriate estimation methods such as robust regressions, fixed-effects regressions, median regression, and generalized linear model estimation like general estimation equations (GEE).

Fourthly, the **outliers**, which are extreme or infrequent values, defined as at least 3 standard deviations above or below the mean and result in extremely high residuals, will (1) inflate the error variance, the standard errors, (2) stretch the confidence interval, and (3) bias parameter estimates. Hence, this calls for the removal of the outliers or the use of appropriate estimation methods. Deletion is not chosen as a course of action since (1) it is unnecessary because it is established that our data does not come from a different population, (2) new outliers might emerge after the removal of initially identified outliers, and (3) it is arguable that the outlying values contain very important information and the removal of the values might be the imposition of new information. Hence, it is chosen to retain them and employ estimation methods that fit them like the robust regressions and quantile regressions.

Fifthly and finally, different techniques are used to check for the ***normality*** of the distribution of the observations of the variables in our data. The histogram of frequencies, the normal probability plot, and the descriptive statistics (*table 4.5*), especially skewness and kurtosis indicate that several of the variables are non-normal. The histograms of frequencies of the observations with the charts option of normal curve constructed for each variable indicate that most of them show non-normality. Additionally, the examination of the skewness indicates the same fact. Notably, ownership variables like INO, INO2, INO3, FAMO, BANKO and GOVO; and the performance variables (ROE, PER, MTBV)

except ROA are positively or right skewed, showing that most cases are to the left of the distribution. Unlike others PER, which comes from DataStream, has not negative observations. This is strange since earnings might be negative unless adjustments is made for PER.

The table also shows that ROA and WHO are negatively (left) skewed, thus indicating that most of the observations fall to the right of the distribution. Comparison of the median and the mean statistics also reveal the same nature of the study. Anyhow, taking the modest rule-of-thumb for normality, those falling in the range of skewness statistics of -2 and +2 (INSTO, OUTO, ABHO, WHO, PNED, DUAL, BSIZE, TDTA, PVOL, and AGE) are approximately normally distributed.

Table 4.5: Descriptive statistics of dependent and independent variables

variable	N	p50	mean	sd	skewness	kurtosis
roa	2793	5.35	6.014	10.28	-1.306	28.52
roe	2731	11.37	17.26	54.98	13.16	292.5
mtbv	2800	1.82	2.864	104.1	20.92	1497
per	2508	18.6	52	294.4	30.04	1152
ino	2656	0	3.885	10.11	3.433	15.91
insto	2656	26.24	28.94	19.48	.6716	3.098
nfo	2656	0	2.587	8.325	4.448	25.23
famo	2656	0	1.73	6.228	5.701	47.62
banko	2656	0	2.223	5.194	6.175	67.72
govo	2656	0	.1519	1.043	8.463	90.61
outo	2656	33.59	36.07	20.59	.4759	2.841
abho	2656	37.84	39.99	22.25	.3868	2.684
who	2656	62.22	60.03	22.25	-.3902	2.68
pned	2632	.6154	.6375	.1996	.1138	2.827
dual	2634	0	.2513	.4339	1.147	2.315
bsize	2633	8	8.295	3.129	1.353	5.896
tointens	2653	.0568	.0688	.0516	2.157	9.029
tdta	2824	14.7	19	18.48	1.471	6.943
pvol	2447	26.55	28.34	10.16	1.018	4.197
ta	2825	4.7e+05	1.3e+07	1.0e+08	15.15	278.5
age	2803	20.82	37.1	34.99	1.094	2.92
rndts	2826	.005	95.83	4509	53.01	2815
fats	2825	1.27	15.68	127.1	31.18	1261
sgats	2825	14.02	32.73	348.7	47.47	2399

The ownership variables INO, INO2, INO3, NFO, FAMO, BANKO and GOVO exhibit highly skewed distribution in the range of 5-9 skewness. Moreover, ROE, MTBV, and PER have higher positive skewness than the ownership variables. It might be suspected that these variables might not yield good results if they are used without transformation, which changes the information content or reality of the state. The same is true with the use of other variables like RNDTS, FATS, and SGATS. However, since other estimation methods that are handy to estimate when variables are not normally distributed exist, it is decided to retain and use them. It must be noted that examination of kurtosis also shows that many of the variables are not normally distributed.

However, the normal Q-Q plot for most of the variables shows that the observations line up evenly along the diagonal 45-degree line, which is the tendency to normality. Nevertheless, this would not be reliable alone unless supported by other method. So, finally, the Shapiro-Wilk test for variable normality shows that the *w* values are significantly less than 1, thus indicating that the assumption of normality is met. Since the data is large (N is more than 2000), Kolmogorv-Smirnov test is also shows that the variables are not normally distributed. Hence, based on most of the checks made it is generally indicative that the variables are not normally distributed and the panel sample lacks the normality assumption for parametric methods.

Finally, the alternatives are (1) to perform data transformation in order to adjust to parametric procedures by normalizing the data artificially, for instance to correct for skewness and kurtosis, or,

(2) to employ estimation methods that are robust to non-normality of variables. Even though the unbalanced panel data has several missing values and few outliers and four dependent variables, it is believed that the imposition of artificial values might (1) completely change the nature or content of the information, (2) change the true nature of mutual association if the dependent variable and the independent variables are transformed by different methods, and (3) lead to the wrong interpretations and conclusions relative to the content of information of the original raw data.

Nevertheless, the checks made to find out the difference in regression results between raw and transformed data of BSIZE, TA, AGE and especially RNDTS and SGATS that contribute a lot to the variances according to VIF indicates that there is no change of their effect on the dependent variables. Hence, it is chosen to avoid the transformation of the raw data that leads to wrong interpretations of the results and the conclusions, when there is a fitting estimation methods for non-normal variables or samples like robust regressions, quartile regressions, and the GEE.

4.4.3.2. Diagnostic Analyses of OLS Assumptions

The data analysis gives a clue that there some of the variables are not normally distributed and that the semi parametric might not be estimated using OLS regression. Before we rule out that a diagnostic analysis of OLS assumptions of NIID are made and presented as *Appendix A.* This enables us to choose appropriate estimation methods depending on the violations of the NIID assumptions.

4.4.3.3 Model Specification

The general relationship to be investigated can be stated as: firm performance is a function of ownership structure, governance mechanisms and control variables. This can be shown simply as:

Performance ~ f (ownership structure, governance mechanisms, control variables)

The general linear specification can be written as:

$$Prfm_{it} = \beta_0 + \beta_{1i}Own_{it} + \sum\beta_{2i}Brd_{it} + \sum \beta_{3i}ExtGM_{it} + \sum \beta_{4i}Ctrl_{it} + \beta_{5i}Prfm_{t-1} + \epsilon_{it}$$

The two basic specific regression equations or models used are:

$$Prfm_{it} = \beta_0 + \beta_1 INO_{it} + \beta_2 INSTO_{it} + \beta_3 NFO_{it} + \beta_4 FAMO_{it} + \beta_5 BANKO_{it} + \beta_6 GOVO_{it} + \sum\beta_{7i}Brd_{it} + \sum\beta_{8i}ExtGM_{it} + \sum\beta_{9i}Ctrl_{it} + \beta_{10i}Prfm_{t-1} + \epsilon_{it} \quad (1)$$

$$Prfm_{it} = \beta_0 + \beta_1 INO_{it} + \beta_2 OUTO_{it} + \sum\beta_{3i}Brd_{it} + \sum\beta_{4i}ExtGM_{it} + \sum\beta_{5i}Ctrl_{it} + \beta_{6i}Prfm_{t-1} + \epsilon_{it} \quad (2)$$

In order to account for the nonlinearity assumption of the form of association of managerial ownership with firm performance proposed by Stulz (1988), firstly, we include INO_{it}, INO_{it}^2 and INO_{it}^3 in the same basic equation or model following the previous studies. Ssecondly, we substitute the square and cube of INO_{it} (INO_{it}^2 and INO_{it}^3) in place of INO_{it} in the basic model unlike the previous studies that include three of them in the same equation because we are sure that INO_{it}^2 and INO_{it}^3 are function of INO and each other, and the analysis by including them in the same equation might lead to spurious interpretation and conclusion.

4.4.4 Estimation Methods

The diagnostic analyses show that most of the OLS or Gaussian assumptions are not met. However, our regression models are tested to be correctly specified. OLS estimation, which would provide consistent estimates especially if the errors are *identically* and *independently* normally distributed (IID), cannot be appropriate estimation method for our sample. Hence the identity or constancy of variances (homoscedasticity) of residuals and independence of residuals (no autocorrelation) would call for other estimation procedures. The alternative estimation procedures are presented below as (1) primary analyses methods, and (2) sensitivity or consistency analyses methods.

4.4.4.1 Methods for Primary Analyses

One of the possible estimation alternatives is to use least squares estimation by controlling for the heteroscedasticity and/ or autocorrelation. The control for heteroscedasticity involves the variance component estimation (VCE) or robust estimation procedures. Robust regressions are considered when (1) heteroscedastic errors exist or suspected, (2) there are outliers, and (3) nonlinearity exists. Some of such robust estimation methods worth to mention are (1) Huber-White's sandwich estimation, (2) clustering robust estimation, (3) iteratively reweighted least squares estimation (IWLS), and (4) quantile, especially median regression. The important feature about the robust standard errors estimations except IWLS is that they produce exactly the same coefficient estimates as the OLS. However, the computation of robust standard errors affects the standard errors, t-value, significance and the confidence intervals. In contrast to the other robust VCEs, the IWLS estimation produce coefficient estimates different from that of the OLS.

Huber-White's sandwich estimation: The Huber-White variance estimator is one of the robust estimation methods, which are consistent and efficient amidst heteroscedastic residuals, produce robust standard errors that can deal with some violations of identity of variances. This procedure is called the White sandwich estimation (Huber, 1967; White, 1980). It uses the finite-sample correction of *n/ (n-k)* to multiply the residual square of the observation in order to estimate the residuals variance. However, even though there is an alternative stricter bias correction term *(1/ ((1-h) ^2)* that modifies the White's variance estimators, this research uses White's robust estimation so as to avoid more complications.

Clustering robust estimation: This is the robust estimation method that allows the violation of independent errors or residuals assumption. When the residuals are independent, there is no significant correlation between the errors of the observations. Clustering the observations into groups might create a situation in which the observations might be correlated within the groups (cluster) but independent between the groups. The within-cluster correlation allows the matrix of sum of squares of the residuals to be block-diagonal, with nonzero elements within the block on the diagonal. The block-diagonal structure allows the disturbances within each cluster to be correlated with each other but requires that the disturbances from differences in cluster be uncorrelated. The standard errors take into account that the observations within groups are *non-independent.* They are computed based on the aggregate scores for the number of elements in the groups since the group-level scores should be independent. In this research, clustering robust estimation is used to account for autocorrelation or non-independence.

Iteratively reweighted least squares (IWLS) estimation: In this robust regression, the least squares are reweighted using Huber's and biweight iterations. Both iteration methods are used together because they have problems when used alone – Huber weights can work poorly with extreme outliers, and biweight iteration do not always converge. The *Huber's iteration* reweighs the residuals assigning smaller weights to larger residuals. This is done by computing case weights from scaled residuals. The scale is the median absolute deviation about the median residual divided by a constant (Huber, 1983). If a residual is small the case of it would be assigned the case weight 1, but if larger the case weight is equal to tuning constant divided by the absolute value of the scale. The weights are used until they are nearly unchanged from iteration to iteration. A number of such Huber iterations converges the model. Then the biweight iteration procedure continues. The *biweight iteration* is the procedure that weights the converged model using biweights. With biweighting, all cases with residuals are downweighted so that all cases with larger residuals are assigned zero weights, thereby eliminating their influence. The procedure will continue until the biweights are nearly unchanged from iteration to iteration, and hence, final converged model is achieved.

4.4.4.2 Methods for Sensitivity or Consistency Analyses

Quantile (median) estimation: Since most of the variables are positively skewed and with outliers it can be argued that the median is the better central tendency measure than the mean. Hence, the median regression might be better and more robust in response to large outliers than the OLS regression that uses the deviation from the mean to calculate variances and the parameter estimates that predict the median. The median regression estimates the median of the dependent variable by taking the raw sum of absolute deviation around unconditional median and finds the regression coefficient that minimizes function (the least median estimates). The computation of the standard errors derives from the estimation of the weighted variance-covariance matrix for the regression coefficients. The weights are estimated by dividing quantile (median) with the true density of the residual. The drawback of this method is that it is sensitive to the distortions created by serious outliers, in which case it is inferior to robust regression, which down-weights the influence of the influential outliers. For heteroscedastic errors, the median regression works well since it underestimates their standard errors.

Fixed-effects regressions: The panel data of our sample has identified groups like *industry* and identifying groups like *time* (*year)* for which there are repetitive measuring of values. The groups might have their own peculiar characteristics that can be sources of difference or heterogeneity. This between-group variation could be the sources of differences in variances or heteroscedasticity of the errors, which violates the IID assumptions. Our data is a construct with six industry dummies, including financial firms and utility and energy companies.

It is obvious that the inclusion of the regulated firms, financial institutions and utility firms, in the sample seems surprising for a reader. However, there are some reasons for it. They are retained in the sample following Demsetz and Lehn (1985), Agrawal and Knoeber (1996), Demsetz and Villalonga (2001) that used dummies and retained them as separate sectors, and Holderness (2009) that excluded no type of firms and did not use dummies to classify into industries. Additionally, the means of different blockholder ownership categories show that financial institutions (including banks) and utility firms exhibit almost similar patterns of variations as the differences among the

remaining 4 industry sectors. Moreover, time has changed and financial firms alone are the significant proportion of the sample of the listed firms and exclusion might question the representativeness of FTSE All Share Index companies, in which case it might be difficult to make inferences of the major UK listed firms from a sample with a selection bias. It can be added that constructing a sample of industrial sectors (excluding financial institutions and utility firms) should not be taken as a standard method or practice when they are significant proportion of listed firms, market capitalization of the UK stock market, and the dominant shareholders in the UK.

One might argue against their inclusion by reasoning that the government interferes in the regulated firms and change management if the management is destroying the value of the firm. However, this is very rare in the UK and change of management also might happen in the other sectors initiated by the shareholders, especially large blockholders or the threat from hostile takeover from the competitors in the same industry if they are engaged in value destroying activities. This is facilitated by high investors' protection and networks of relationship among institutional investors, whom other shareholders might follow.

Hence, it has not been necessary to omit financial firms and energy and utility companies from the sample since the differences among all sectors can be controlled by within fixed-effect estimation. It is possible to make fixed effect models with or without dummy variables. In this research, the estimation without employing the dummy variables is chosen for both *industry fixed-effects* or for *time (year) fixed-effects within estimations* in order to avoid the dummy variable trap and ending up with very low degrees of freedom.

The fixed-effects regression is the technique that estimates the fixed effects of independent variables on the dependent variable by controlling for the differences arising from unobserved heterogeneity between groups, omitted variables, between groups even without measuring the differences as long as they are constant or fixed within group overtime. The assumption is that the individual specific effect is correlated with the independent variable. The method eliminates much of the error variances created by the distortions due to the between-individual variations arising from the unmeasured personal characteristics or unobserved heterogeneity that are correlated to the independent variables.

The fixed-effect regression procedure first computes the group means of the dependent and independent variables. Then the variables are transformed to get the deviations from the group means. Thereafter, the least squares regression is run on the transformed variables. The estimation gives correct standard errors and F-test and p-value for the null hypothesis that coefficients of all groupings are zero. Since the fixed effect estimators depend only on deviations from their group means, they are referred to as *within-groups estimators* (Davidson and MacKinnon, 1993). However, the intercept (constant term) varies across the groups and or times and it consists of the overtime stable group specific variation.

Nevertheless, heteroscedasticity or autocorrelation that plagues estimation arises from group specific or time-specific variations, whose individual specific effects might be uncorrelated with the independent variables. In such case, one way to handle error is by assuming that the intercept is a random outcome of variables (Greene, 2003). The random outcome is a function of a mean value plus a random error. Models with such assumptions are called random effect models.

In a panel data, even though fixed effect estimation is always the reasonable thing to do since they always give consistent results that might not be the most efficient. However, random effect is a more efficient estimator that gives better p-values. So, in the Hausman test made in order to test and choose between the two models, the chi-square test shows significance, hence, there is evidence that fixed-effect modelling is justified for use.

Generalized estimation equation (GEE): GEE is the estimation method that is the extension of the generalized linear model, devised to handle the violations of some IID assumptions, especially autocorrelation. The GEE method, which is proposed by Liang and Zeger (1986), is a population-averaged model, which is widely used in panel data analyses, even when the response variable is not Gaussian in distribution. It is a form of iterated generalized least squares that allows the correlations among the repeated observations for each individual. The method allows for the specification of the within-group correlation structure for the panels, which are also known as population-averaged panel-data models.

GEE is equivalent to the generalized least squares (GLS) for linear models. However, we suspect nonlinearity in our model, especially theoretically asserted managerial ownership impact on firm performance. Hence, GLS might not be a proper estimation method to use. Anyhow, GEE produces more efficient estimates of the coefficients by taking the over-time correlations into account.

Its parameter estimates are consistent and their asymptotic variances are efficient. The method can take into account the correlation between observations by also using the option that produce empirical (sandwich/robust) variance estimator. Additionally, GEE has the ability to handle the missing data on the response variables and the unbalanced panels assuming that the missing observations are missing completely at random (MCAR), which is the attribute of our data. Therefore, the robust option is not used here since the use or the assumption that the correlation between dependent variables at different times are all the same is enough.

In conclusion, in the empirical analyses of the models first by the methods described under the primary analyses described above. Then, the methods described for sensitivity or consistency analyses will be used in order to report and interpret the results or evidence.

4.5. PRIMARY RESULTS AND ANALYSES

4.5.1 Overall Presentation

The results of the primary analysis on the investigation of positive or negative association between blockholders on firm performance are presented. These include the pooled OLS estimation and the robust estimations that are variance estimation procedures used to model the relationships with the violation of IID. The results and the analyses are presented separately for the two models previously stated in the methodology. The same set of explanatory variables generally have different results across the performance variables (ROA, ROE, MTBV, and PER). Nevertheless, only the accounting performance measures (ROA and ROE) are found to show interesting patterns of relationships between ownership variables and/ or corporate governance mechanisms and firm performance. The regression of market-to-book value (MTBV) and the price-earnings ratio (PER) on the independent variables resulted mostly in insignificant influence of independent variables on performance. These facts raise an important issue regarding the choice between accounting measures or market measures in investigating the relationship between ownership structure and performance.

Different types of robust estimation methods – White sandwich estimation (RobWhite), iteratively weighted least squares (RobIWLS, commonly called robust regression), and clustering robust estimation (RobCluster) - are used in order to achieve robust estimates allowing for the violations of the IID of residuals. As it can be seen from *tables 5.11 – 5.13* and *5.17-5.18,* the coefficients are the same with that of pooled OLS estimation (except in IWLS) since what are dealt with is the estimation of the variance components that changes the t-test statistics and the confidence intervals, which impacts change in the coefficient estimates.

Moreover, it can be noted the IWLS robust regression has more power than the White's robust (RobWhite) and Cluster robust (RobCluster) regressions by not only improving the standard errors and t-statistics but also improving the magnitude of the coefficients and the significance of t-test. This might be from the impact of the iteration and reweighting that might penalize the residuals too much when compared to White's estimation, thus resulting in lower coefficients. For instance, even after accounting for autocorrelation, the clustering robust estimation showed significant positive association of insiders' ownership (INO) for ROA, ROE and MTBV, though not so for PER (*tables 5.11* and *5.12*). Hence, it might be suggested that IWLS robust estimates are more reliable than others to provide evidence and we have included the results of IWLS estimators.

Furthermore, it must be noted that the reported statistics in the regressions used in this analysis are the coefficients with the significance level of their t-statistics. For interpretations of the results, mainly the significance level of the relationships is used. Even though the magnitudes of effect that can be observed from the coefficients are also useful for economical interpretation, focus is made on the significance of the positive or negative relationships and the very small values of the coefficients observed in the results should not cast doubts on the relationships.

4.5.2 Insider Ownership and Firm Performance

4.5.2.1 Linearity Assumption

Table 4.11 and *4.12* presents the regressions that assume linearity of insider ownership. The F-tests show that the overall fit of the model is good for all estimation methods. However, the R^2 and the *adjusted* R^2 for IWLS is very low. This does not create any problem as in other similar variables that come from economic data since we are using non-OLS estimation methods and since we are not concerned with the magnitude of the coefficients but the positive or negative relationships.

Table 4.11: Linear regressions on ROA and ROE using OLS, White's sandwich, clustering robust, and IWLS estimations on the first model

OLS and Robust Estimates on ROA

Variable	OLS_A	RobWhite	RobCluster	RobIWLS
ino	0.0607***	0.0607***	0.0607**	0.0166*
insto	-0.0032	-0.0032	-0.0032	-0.0154***
nfo	-0.0050	-0.0050	-0.0050	0.0192*
famo	-0.0265	-0.0265	-0.0265	-0.0166
banko	0.0142	0.0142	0.0142	-0.0487***
govo	0.0230	0.0230	0.0230	-0.0519
pned	-2.5061**	-2.5061**	-2.5061	-2.9748***
dual	-2.5464***	-2.5464***	-2.5464***	-2.4507***
bsize	0.0084	0.0084	0.0084	-0.0665*
tointens	7.7429**	7.7429**	7.7429*	2.7429
tdta	-0.0206*	-0.0206*	-0.0206	-0.0034
pvol	-0.0891***	-0.0891***	-0.0891	-0.0370***
ta	-0.0000*	-0.0000**	-0.0000**	-0.0000***
age	0.0046	0.0046	0.0046	0.0034
rndts	0.0013***	0.0013***	0.0013	-0.0136***
fats	-0.0025	-0.0025	-0.0025	-0.0027
sgats	-0.0166***	-0.0166***	-0.0166	-0.0055**
roat1	0.2647***	0.2647***	0.2647***	0.3234***
_cons	9.1716***	9.1716***	9.1716***	8.4178***
	legend: * p<.1; ** p<.05; *** p<.01			
R^2	0.1388	0.1388	0.1388	-

OLS and Robust Estimates on ROE

Variable	OLS_A	RobWhite	RobCluster	RobIWLS
ino	0.0928	0.0928	0.0928	0.0184
insto	-0.0902*	-0.0902**	-0.0902	-0.0486***
nfo	0.2702**	0.2702	0.2702	0.0072
famo	-0.1535	-0.1535**	-0.1535	-0.0549
banko	0.0976	0.0976	0.0976	-0.0468
govo	0.5179	0.5179	0.5179	-0.2244
pned	-11.5162*	-11.5162***	-11.5162*	-7.0907***
dual	-7.7884***	-7.7884***	-7.7884***	-7.7687***
bsize	0.7652**	0.7652	0.7652	0.0615
tointens	0.9413	0.9413	0.9413	-5.5804
tdta	0.0289	0.0289	0.0289	-0.0247*
pvol	-0.3108***	-0.3108***	-0.3108*	-0.0850***
ta	-0.0000*	-0.0000**	-0.0000	0.0000
age	-0.0313	-0.0313*	-0.0313	-0.0076
rndts	0.0022	0.0022***	0.0022*	-0.0194***
fats	-0.0428**	-0.0428***	-0.0428**	-0.0103*
sgats	-0.0239	-0.0239**	-0.0239	-0.0143***
roet1	0.1692***	0.1692***	0.1692***	0.2256***
_cons	28.1373***	28.1373***	28.1373***	20.9764***
	legend: * p<.1; ** p<.05; *** p<.01			
R^2	0.0848	0.0848	0.0848	-

Note: As indicated in the *legend:* * indicates significance at 10% level; ** indicates significance at 5% level; *** indicates significance at 1% level.
OLS_A is ordinary least squares estimation where linear assumption of INO is used; RobWhite is White's sandwich robust estimation; RobCluster is cluster robust estimation that uses industry as a factor; and RobIWLS is the robust regression that uses iterated weighted least squares method.

From *tables 4.11* and *4.12*, it is observable that INO show consistent significant positive relationship with ROA, ROE, and MTBV with White robust, cluster robust and IWLS estimations. This result of consistent positive relationship of INO and ROA, MTBV and PER confirms the alignment of interest hypothesis regarding the aggregate ownership of insiders.

Table 4.12: Linear regressions on MTBV and PER using OLS, White's sandwich, clustering robust, and IWLS estimations on the first model

OLS and Robust Estimates on MTBV

Variable	OLS_A	RobWhite	RobCluster	RobIWLS
ino	0.0656	0.0656	0.0656	0.0074***
insto	0.0492	0.0492	0.0492	-0.0030**
nfo	0.0749	0.0749	0.0749	0.0040
famo	0.0252	0.0252	0.0252	-0.0128***
banko	-0.0234	-0.0234	-0.0234	-0.0005
govo	-0.1106	-0.1106	-0.1106	-0.0216
pned	-8.7724	-8.7724	-8.7724	-0.6902***
dual	0.1743	0.1743	0.1743	-0.9173***
bsize	-0.0548	-0.0548	-0.0548	0.0224**
tointens	15.6038	15.6038	15.6038	-0.2703
tdta	-0.1487*	-0.1487	-0.1487	0.0006
pvol	-0.2623*	-0.2623	-0.2623	0.0110***
ta	0.0000	0.0000	0.0000	-0.0000***
age	-0.0088	-0.0088	-0.0088	0.0005
rndts	0.0029	0.0029***	0.0029*	0.0008***
fats	0.0061	0.0061	0.0061	-0.0022***
sgats	-0.0132	-0.0132	-0.0132	-0.0004
mtbvt1	0.0098	0.0098	0.0098	0.0064***
_cons	14.7662	14.7662	14.7662	2.2282***
			legend: * p<.1; ** p<.05; *** p<.01	
R^2	0.0254	0.0254	0.0254	-

OLS and Robust Estimates on PER

Variable	OLS_A	RobWhite	RobCluster	RobIWLS
ino	-0.2675	-0.2675	-0.2675*	0.0091
insto	-0.0774	-0.0774	-0.0774	-0.0132
nfo	-0.6919	-0.6919	-0.6919	-0.0283
famo	0.1191	0.1191	0.1191	-0.0310
banko	-0.1861	-0.1861	-0.1861	-0.0023
govo	-0.8423	-0.8423	-0.8423	1.0134***
pned	83.8838*	83.8838*	83.8838**	-0.1296
dual	47.0923**	47.0923***	47.0923***	4.3751***
bsize	-0.7625	-0.7625	-0.7625	-0.0385
tointens	-76.3636	-76.3636*	-76.3636***	0.7510
tdta	0.0281	0.0281	0.0281	-0.0087
pvol	0.3672	0.3672	0.3672	-0.0752***
ta	-0.0000	-0.0000	-0.0000	-0.0000
age	-0.2589	-0.2589	-0.2589	0.0013
rndts	-0.7373	-0.7373	-0.7373	-0.0924**
fats	-0.0188	-0.0188	-0.0188	0.0130***
sgats	0.4586*	0.4586	0.4586***	0.0271***
pert1	0.2674***	0.2674**	0.2674*	0.7474***
_cons	-20.2902	-20.2902	-20.2902	7.3808***
			legend: * p<.1; ** p<.05; *** p<.01	
R^2	0.0532	0.0532	0.0532	-

Note: As indicated in the *legend:* * indicates significance at 10% level; ** indicates significance at 5% level; *** indicates significance at 1% level.

OLS_A is ordinary least squares estimation where linear assumption of INO is used; RobWhite is White's sandwich robust estimation; RobCluster is cluster robust estimation that uses industry as a factor; and RobIWLS is the robust regression that uses iterated weighted least squares method.

From the statistical comparison of different estimation methods employed, it might be suggestive that cluster robust regression, which corrects for heteroscedasticity and produce efficient estimators by also handling autocorrelation when industry differences are accounted for, and the more strict IWLS methods are appropriate for interpretations. We note that most of the interpretations of the results of the primary analysis are based on IWLS.

4.5.2.2 Nonlinearity Assumption

Table 4.13 presents the IWLS regression assuming nonlinearity of INO, where INO, INO^2, and INO^3 are included in one-equation or model.

Table 4.13: Regression with nonlinear assumption of insider ownership in one-equation setting on ROA using OLS, White's sandwich, clustering robust, and IWLS estimations on the first model

OLS-Robust Estimates on ROA

Variable	OLS	RobWhite	RobCluster	RobIWLS
ino	0.1705*	0.1705*	0.1705*	0.0001
ino2	-0.0047	-0.0047	-0.0047	-0.0000
ino3	0.0000	0.0000	0.0000	0.0000
insto	-0.0032	-0.0032	-0.0032	-0.0154***
nfo	-0.0047	-0.0047	-0.0047	0.0198*
famo	-0.0305	-0.0305	-0.0305	-0.0152
banko	0.0160	0.0160	0.0160	-0.0492***
govo	0.0257	0.0257	0.0257	-0.0523
pned	-2.3879*	-2.3879**	-2.3879	-3.0044***
dual	-2.5257***	-2.5257***	-2.5257***	-2.4995***
bsize	0.0160	0.0160	0.0160	-0.0725**
tointens	7.8394**	7.8394**	7.8394*	2.7288
tdta	-0.0204*	-0.0204*	-0.0204	-0.0037
pvol	-0.0919***	-0.0919***	-0.0919	-0.0366***
ta	-0.0000	-0.0000**	-0.0000*	-0.0000***
age	0.0047	0.0047	0.0047	0.0034
rndts	0.0013***	0.0013***	0.0013	-0.0137***
fats	-0.0024	-0.0024	-0.0024	-0.0026
sgats	-0.0165***	-0.0165***	-0.0165	-0.0055**
roat1	0.2636***	0.2636***	0.2636***	0.3209***
_cons	9.0171***	9.0171***	9.0171***	8.5300***

legend: * p<.1; ** p<.05; *** p<.01

R-squared	**0.1395**	**0.1395**	**0.1395**	**-**

Note: As indicated in the *legend:* * indicates significance at 10% level; ** indicates significance at 5% level; *** indicates significance at 1% level.

It can be viewed that results of the robust regressions show that INO exhibit positive relation with firm performance, ROA, and this result supports the alignment of interest hypothesis. However, the results show that INO^2 and INO^3 have no systematic relation with firm performance at all. It should be noted here that even though there are negative and positive very low magnitude of effects of INO^2 and INO^3 respectively, we do not have enough confidence to conclude that there is alignment-entrenchment-alignment hypothesis of Stulz (1988).

The results of the regression of the independent variables on other performance or value variables (which are not presented here) also show the same evidence and that even the linear INO loses its significance when INO^2 and INO^3 are also used in the same equation in some estimation methods (see RobIWLS result in *table 4.13*). Hence, it is suggestive that the inclusion of INO, INO^2 and INO^3 that are the definitely a function of each other, and hence have high multicollinearity, in the same model or equation leads to spurious relationships, where it is difficult to exactly know the contribution of each of the variables in predicting the dependent variable.

The pairwise correlation (*table 4.14)* shows that INO and INO^2 have a correlation of 0.9217 on the one side, INO^2 and INO^3 are with a correlation of 0.9699 on the other side, and finally INO and INO^3 (that have a correlation of 0.8138) are almost perfectly collinear. Hence, it might be suggestive that the inclusion of any of the variables together in the same equation is a procedural error statistically, and the exclusion of two of them when one of them used in the equation might be statistically

appropriate. Hence, this study uses stepwise regression of INO, INO^2 and INO^3 in order to check for the nonlinear relationship between insider ownership and firm performance.

Table 4.14: Pairwise correlation between INO, INO^2 and INO^3

	ino	ino2	ino3
ino	**1.0000**		
ino2	**0.9217**	**1.0000**	
ino3	**0.8138**	**0.9699**	**1.0000**

Tables 4.15 and 4.16 present the comparative investigation of nonlinearity assumption regarding managerial ownership using IWLS regression on ROA, ROE, MTBV and PER using INO, INO^2 and INO^3 separately in the model. The stepwise regression results show that there is a strong evidence to believe that INO has significant *positive relationship* with performance (ROA and MTBV). But they have insignificant positive association with ROE and PER. The result is surprising since it is in contrast to alignment-entrenchment-alignment hypothesis as suggested by Stulz (1988) and as reported by Morck et al. (1988) for the US firms, and Short and Keasey (1999) and Faccio and Lasfer(1999) for the UK firms, and the alignment-entrenchment finding of McConnell and Servaes (1990).

The surprising result of not showing negative and positive relationships of INO2 and INO3 respectively might be ascribed to some differences with related studies in terms of the methodology or data used. Firstly, the difference might arise from the differences in empirical modelling, in which we estimated INO, INO2 and INO3 in separate equations instead of including them in the same model. As already noted, this is done in order to avoid the imposition of more multicollinearity into the model. It might be arguable that the previous studies that report positive and negative relation of INO2 and INO3 respectively with performance disregard the strong multicollinearity between the three forms of insider ownership that leads to spurious relationship that might make it difficult to exactly tell the contribution of a variable in the change of the dependent variable.

Secondly, there might be difference of the components of insider ownership (executives' ownership and nonexecutive's ownership), where our data on the variable is made up of the aggregate of executives and nonexecutive directors as provided in the Waterlow Stock Exchange Yearbook. The positive relation of INO with firm performance might be consistent with the finding of Florackis et al. (2009) for the UK firms, which considers linear assumptions of NEDs' ownership in the model. Even though our data is not checked, it might be arguable the NEDs might own a larger part of the aggregate insider ownership than the executives, who have the incentive to diversify their portfolio in order to avoid idiosyncratic component of corporate risk (Garvey and Milbourn, 2003; Jin, 2002; Florackis et al., 2009). Hence, it might be the case that a great part of the ownership stakes of executives might be less than 3%, even though our data is not checked on this due to the package of its source. Hence, the difference in insider ownership association with performance might be because our data lacks managerial ownership in the range of 0.5%, the UK disclosure level for management, and 3%. So, it might be suggestive that the alignment-entrenchment-alignment hypothesis might be proper with the ownership of executives as in Florackis et al. (2009).

Table 4.15: Nonlinear regressions on ROA and ROE using IWLS estimations on the first model

RobIWLS on ROA

Variable	INO	INO2	INO3
ino	0.0166*		
insto	-0.0154***	-0.0153***	-0.0154***
nfo	0.0192*	0.0195*	0.0198*
famo	-0.0166	-0.0161	-0.0153
banko	-0.0487***	-0.0489***	-0.0492***
govo	-0.0519	-0.0522	-0.0523
pned	-2.9748***	-2.9927***	-3.0038***
dual	-2.4507***	-2.4883***	-2.4988***
bsize	-0.0665*	-0.0705**	-0.0725**
tointens	2.7429	2.7253	2.7289
tdta	-0.0034	-0.0035	-0.0037
pvol	-0.0370***	-0.0370***	-0.0366***
ta	-0.0000***	-0.0000***	-0.0000***
age	0.0034	0.0034	0.0034
rndts	-0.0136***	-0.0136***	-0.0137***
fats	-0.0027	-0.0027	-0.0026
sgats	-0.0055**	-0.0055**	-0.0055**
roat1	0.3234***	0.3203***	0.3210***
ino2		0.0004*	
ino3			0.0000*
_cons	8.4178***	8.5019***	8.5276***

legend: * p<.1; ** p<.05; *** p<.01

RobIWLS on ROE

Variable	INO	INO2	INO3
ino	0.0184		
insto	-0.0486***	-0.0477***	-0.0476***
nfo	0.0072	0.0073	0.0075
famo	-0.0549	-0.0557	-0.0548
banko	-0.0468	-0.0454	-0.0456
govo	-0.2244	-0.2264	-0.2269
pned	-7.0907***	-7.0865***	-7.1037***
dual	-7.7687***	-7.7880***	-7.8039***
bsize	0.0615	0.0587	0.0558
tointens	-5.5804	-5.6878	-5.7032
tdta	-0.0247*	-0.0247*	-0.0249*
pvol	-0.0850***	-0.0848***	-0.0844***
ta	0.0000	0.0000	0.0000
age	-0.0076	-0.0074	-0.0073
rndts	-0.0194***	-0.0194***	-0.0194***
fats	-0.0103*	-0.0103*	-0.0103*
sgats	-0.0143***	-0.0143***	-0.0143***
roet1	0.2256***	0.2256***	0.2256***
ino2		0.0006	
ino3			0.0000
_cons	20.9764***	20.9591***	20.9978***

legend: * p<.1; ** p<.05; *** p<.01

Table 4.16: Nonlinear regressions on MTBV and PER using IWLS estimations on the first model

RobIWLS on MTBV

Variable	INO	INO2	INO3
ino	0.0074***		
insto	-0.0030**	-0.0031**	-0.0033**
nfo	0.0040	0.0040	0.0040
famo	-0.0128***	-0.0122***	-0.0119***
banko	-0.0005	-0.0008	-0.0010
govo	-0.0216	-0.0217	-0.0219
pned	-0.6902***	-0.7093***	-0.7186***
dual	-0.9173***	-0.9185***	-0.9212***
bsize	0.0224**	0.0212**	0.0205**
tointens	-0.2703	-0.2675	-0.2577
tdta	0.0006	0.0005	0.0004
pvol	0.0110***	0.0115***	0.0117***
ta	-0.0000***	-0.0000***	-0.0000***
age	0.0005	0.0004	0.0004
rndts	0.0008***	0.0007***	0.0007***
fats	-0.0022***	-0.0022***	-0.0022***
sgats	-0.0004	-0.0004	-0.0004
mtbvt1	0.0064***	0.0064***	0.0064***
ino2		0.0001***	
ino3			0.0000**
_cons	2.2282***	2.2525***	2.2693***

legend: * p<.1; ** p<.05; *** p<.01

RobIWLS on PER

Variable	INO	INO2	INO3
ino	0.0091		
insto	-0.0132	-0.0136	-0.0138
nfo	-0.0283	-0.0285	-0.0286
famo	-0.0310	-0.0297	-0.0293
banko	-0.0023	-0.0035	-0.0040
govo	1.0134***	1.0131***	1.0138***
pned	-0.1296	-0.1746	-0.1929
dual	4.3751***	4.3863***	4.3947***
bsize	-0.0385	-0.0406	-0.0412
tointens	0.7510	0.8031	0.8323
tdta	-0.0087	-0.0088	-0.0089
pvol	-0.0752***	-0.0742***	-0.0740***
ta	-0.0000	-0.0000	-0.0000
age	0.0013	0.0012	0.0011
rndts	-0.0924**	-0.0925**	-0.0925**
fats	0.0130***	0.0132***	0.0132***
sgats	0.0271***	0.0272***	0.0273***
pert1	0.7474***	0.7473***	0.7470***
ino2		0.0001	
ino3			0.0000
_cons	7.3808***	7.4332***	7.4615***

legend: * p<.1; ** p<.05; *** p<.01

Note: As indicated in the *legend:* * indicates significance at 10% level; ** indicates significance at 5% level; *** indicates significance at 1% level.
IWLS does not give R^2 statistics.
INO is linear assumption of managerial ownership; INO2 is quadratic assumption of managerial ownership (INO^2); and INO3 is cubic assumption of managerial ownership for the first model (INO^3).

Thirdly, the data type might be a source of difference in results. According to Demsetz and Lehn (1985) managerial ownership level is determined endogenously in the equilibrium. It might be suggested that the equilibrium is dynamic that takes some years to attain the optimal level. Hence, it might be arguable that a panel data is more proper to take this into account than cross-sectional data. Hence, it is difficult to compare the results from this panel data with the cross-sectional data.

Fourthly, many of the classical studies (Morck et al., 1988; McConnell and Servaes, 1990; Hermalin and Weisbach, 1991) and Short and Keasey (1999) that report nonlinear relationship between managerial ownership and performance do not assume endogeneity of ownership structure and reverse causality between ownership and performance. Later studies (Cho, 1998; Himmelbjerg et al., 1999) accounted for endogeneity and unobservable firm characteristics in their analysis have shed some doubt about nonlinear relationship between managerial ownership structure and firm performance. Moreover, the recent studies on the UK firms by Davis et al. (2005) that accounted for endogeneity and Florackis et al. (2009) in their parametric analysis report that there might be more

than two turning points in the non-linear relationship between them. Even controlling for endogeneity Davis et al. (2005) find evidence that there is the reverse causality (nonrecursive relationship) between managerial ownership and firm performance. However, using parametric method Florackis et al. (2009) find that there are more than 2 turning points in which not only curvilinear and cubic but quintic relationships are observed. Furthermore, evidence on the results of nonparametric analysis of nonlinear relationship by Florachis et al. (2009) show strong alignment of interest for executive ownership lower than 15% (not beyond that) and no support for nonlinear relationship between executive ownership and firm performance in contrast to the results from Short and Keasey (1999) and Davis et al. (2005) on the UK firms. Hence, the two findings cast doubt on the previous reports that support the alignment-entrenchment or alignment-entrenchment-alignment hypothesis.

To sum up, the result of this study implies that as the aggregate insider ownership increases firm performance rises, thus supporting the alignment of interest hypothesis (Jensen and Meckling, 1976; Jensen, 1993). The inference of the positive nonlinear relationship between directors' ownership (INO) and performance is that there might be a special nature of the behaviours of the management in the UK, namely working in the best interest of the shareholders to maximize firm performance. This is in line with Kren and Kerr (1997) who suggest that board shareholdings provide incentives to directors to act like owners diverging from their monitoring efforts. So, as INO increases the agency costs will be reduced (McKnight and Weir, 2009) and this might enhance firm performance.

Moreover, the insight regarding the decreases in the coefficients of INO when nonlinear assumptions are accounted for might be that there is the alignment of interest increases at a decreasing rate thus exhibiting the law of diminishing marginal productivity as managerial ownership increases. It might also be argued that the reduced rate of performance with the different roots of the polynomial might indicate the potential for both an incentive and an entrenchment effect, which are supposed to happen at the same time with one outweighing the other after a certain degree of ownership level. Hence, it might be suggestive that the reduced rate of performance could be due to the increasing impact of the entrenchment effect which reduces the positive benefits from the incentive alignment effect.

Finally, it might arguably be wise to consider the conclusion of Florackis et al. (2009) that the high-order polynomials specification employed in parametric analysis might seemingly capture local stationary points in the curves, and the significant coefficient estimates of the higher-order terms are not useful to draw strong inferences regarding the impact of executive ownership and firm performance.

4.5.3 External Blockholder Ownerships and Firm Performance

Table 4.11 and *4.12* also show the relationship between different categories of blockholder categories and firm performance, mainly using IWLS robust estimation. The result show that nonfinancial firms share ownership (NFO) has *positive* relationship with ROA, MTBV, and ROE (though insignificant with ROE) but *negative* significant relationship with PER. The result is almost similar to that of INO. This might suggest that INO and NFO that own about 6% and 2.6% of the commons shares of the firms in the sample respectively might enhance firm performance because the decisions or actions of the nonfinancial owners are also undertaken by the directors. The evidence of *positive* association might confirm the alignment of interest hypothesis. It might be arguable that nonfinancial firm' owners might enhance firm performance of the firm in which they own shares as their ownership stake increases, and this might also be through some network relationship between managers across firms.

On the other hand, the result shows that institutional ownership (INSTO) that control about 29% of the shares of the firms in the sample exhibits statistically significant *negative* relationship with firm performance measured in ROA, ROE, MTBV, and PER. This in line with the evidence of Faccio and Lasfer (2000) on the UK pension funds (the largest shareholder category in the UK). The results might support the *conflict-of interest hypothesis* and the *strategic-alignment hypothesis* of Pound (1988). Institutional investors' category might not undertake monitoring for control purpose. The category might rather have profitable business relationship with the management of the investee firm that might coerce them to vote with management. Additionally, it might suggest that institutional investors' category and their investee company might cooperate on mutually advantageous strategic issues. The unexpected result is in contrast to the findings of Short and Keasey (1999) on the UK firms and Chiganti and Damanpour (1991). Similarly family ownership (FAMO), bank ownership (BANKO) and state (GOVO) that own less (1.73%, 2.22% and 0.15% respectively) of the sample's outstanding shares also are found to have *negative* association with ROA, ROE, and MTBV even though GOVO show insignificant relation with ROA and *positive* significant association with PER, and BANKO is insignificant with MTBV and PER.

Overall, the results show that outsider blockholder ownership categories (INSTO, FAMO, BANKO and GOVO) have negative influence of firm performance. The evidence might suggest the conflict-of interest hypothesis and the appropriation hypothesis on external blockholders (family or individual household, bank and state ownership) in general, and the strategic-alignment hypothesis on institutional owners. Hence, the evidence might indicate that there is the second type of agency problem, where the behaviour of large outsider shareholders with the incentives and ability to exert control pressure could cause agency costs and expropriation of minority shareholders driven by the private benefits of control (Shleifer and Vishny, 1997; La Porta et al., 2000).

4.5.4 Aggregate Outsider Ownership and Firm Performance

The analyses of the second model presented in *table 4.17* and *4.18* in *Appendix B* that focuses on the relation of INO and aggregate external blockholders' ownership (OUTO) on firm performance also show consistent results similar to that of the first model presented as *table 4.11-4.12* and *4.15-4.16.* Considering the consistent results on ROA using the IWLS robust estimation method, aggregate ownership of insiders (INO) still shows *positive* relationship with firm performance (though not significant with ROE and PER) consistent with the results of the first model analyzed in *section 4.5.3*. The evidence confirms the alignment of interest hypothesis.

Consistent to the result on its components (INSTO, NFO, FAMO, BANKO, and GOVO) discussed previously, the aggregate outsider block ownership (OUTO) shows *negative* relationship with firm performance measured in ROA, ROE, MTBV, and PER though the negative relation is not significant with PER. This evidence supports the appropriation hypothesis with respect to the external blockholders in case they form coalition for collective actions in order to control the firm and it suggests the relevance of the second-order agency conflicts between large blockholders and minority shareholders.

It can be observed from *table 4.19* in *Appendix B* that presents IWLS robust estimation results that the aggregate outsider ownership (OUTO) is significantly *negatively associated* with firm performance measured in ROA, ROE, and MTBV, and that OUTO has insignificant negative impact on PER. The result is consistent with the finding of Weir et al. (2002) for the UK firms. The evidence from the result of this study is in contrast to the monitoring hypothesis. However, the evidence on the aggregate ownership of external blockholders supports the second-order agency perspective and it might suggest that large external blockholders might appropriate minority shareholders. The insight is that the aggregate blockholdership control of the firm might influence the firm performance negatively due to the private benefits of control (Grossman and Hart, 1980; Holderness, 2003).

4.5.5 Dynamic Endogeneity and Reverse-Causality

One important assumption or consideration accounted for in this research is the endogeneity of ownership structure. Thus, the two models are framed in such a way that the previous performance variable, which is a dependent variable, is one of the explanatory variables. All the different estimation methods used show that the lagged dependent (performance) variables (ROA_{t-1}, ROE_{t-1}, $MTBV_{t-1}$, PER_{t-1}) significantly determine the current performance, consistent with evidence from Weir et al. (2002). There is a very strong evidence (mostly at 1% significance level) to believe that they have *positive* correlation with ROA, ROE, MTBV and PER in all robust estimations (*4.11-4.12* and *4.15-4.19*).

The dynamic endogeneity explains the potential for reverse-causality relationship between managerial (insider) ownership and firm performance. It might be the case that the current managerial ownership is correlated to the errors of the dependent variable, and that the outcome of the managerial ownership also depends on the state of the lagged dependent variables. The insight is that depending on the previous performance of the firm, insider investors might be influenced to increase or decrease their ownership stake in the company that might affect their incentives and

ability to control the firm and influence current firm performance. However, it is worthwhile to note that the methodology is not robust enough to fully account of the other sources of endogeneity that arise in the two models, and hence, it has its limitation to fully solve the problem that arises.

4.5.6 Governance Mechanisms and Firm Performance

4.5.6.1 Board of Directors

Nonexecutive Directors: The results on the three board characteristics variables in *4.11-4.12* and *4.15-4.16*, namely, the proportion of nonexecutive directors (PNED), duality (DUAL) and board size (BSIZE) are quite interesting. There is strong evidence that PNED and DUAL show consistent *negative* association with ROA, ROE, and MTBV according to IWLS robust estimation methods. The result is consistent with the findings of Yermack (1996), Agrawal and Knoeber (1996), Bhagat and Black (1998), and Weir and Laing (2003). The premise is that firms with higher proportions of NEDs tend to experience lower performance, which is *inconsistent* with the monitoring hypothesis of the agency theory. The result is also in contrast to the no relationship results of Vafeas and Theodorou (1998) and Laing and Weir (1999) for the UK firms and Baysinger and Hoskisson (1990) and Hermalin and Weisbach (1991).

The theoretical reasons for no support for the expected positive relation of PNED with performance might be (1) NEDs are only part-timers and might have other commitments that affect their devotion to undertake effective monitoring, (2) they might lack the necessary expertise and knowledge of the technical business issues, (3) NEDs might lack access to sufficient information required when making key decisions (Weir and Laing, 2001; Bozec, 2005), and (4) PNED might be an endogenous variable that might not be properly handled by the methodology employed in this study.

However, Weir et al. (2002) find positive *insignificant* impact of PNEDs on firm performance and find that independent directors have positive significant relation with firm performance measured in Tobin's Q. Anyhow, since all NEDs cannot qualify independence characteristics required by the codes in order to effectively and responsibly monitor the management the interpretation of this result that uses external directors should be with caution. Hence, we would like to present some of the tentative comments on the surprising result regarding NEDs as follows:

- Firstly, the negative association of PNED with performance does not necessarily imply that the increase in PNED will necessarily reduce firm performance and that the recommendations of the UK Code of Best Practices on directors' independence and the number of NEDs are wrong.
- Secondly, it can rather be argued that the NEDs are part of the management (one-tier system) and they could be utility maximizers (private benefits, higher compensation, re-nomination, etc.) and might cooperate with the executive managers which might lead to reduce performance. It might tempt us to think that the current economic and corporate crisis might be the cumulative effect of corporate scandals related to this even though it is difficult to substantiate and generalize behavioural aspects of the NEDs of the UK firms.
- Thirdly, there might also be some other attributes that the model of the board of directors is lacking and PNED cannot alone determine firm performance in the UK. For instance, it is yet difficult to substantiate that the absence of the two-tier board system in the UK has problem

whereas there are board problems in the two-tier systems like Germany and other Continental European countries, where the supervisory function is distinct from the management function.

- Finally, it might be argued that NEDs are necessary but not sufficient requirement in determining firm performance in the UK corporate system since other factors, high investors protection and contestability of control in the UK listed firms, have the substitution effect on NEDs in determining firm performance. It might also be suggestive that other external governance mechanisms might have a complementary or substitution effects on NEDs to enhance firm performance. It can be added that the endogenous relationship between board of directors and firm performance, where current board characteristics is affected by past performance might also affect the result.

CEO-Duality: The interesting evidence from the result is the expected *negative* correlation between CEO-duality and firm performance. In other words, the split of duality enhances firm performance. The evidence supports the report on event study of Dahya et al. (1996) that show positive impact of stock prices on the announcement of the split of duality for the UK firms, and that of Rechner and Dalton (1991), which reports negative impact of CEO-duality on firm performance for US firms. The result is inconsistent with the findings of Weir and Laing (2003) on UK firms, and Boyd (1995), Donaldson and Davis (1991) on US firms that firms with duality have better performance than those with separate leadership. It is also in contrast to the result of O'Sullivan and Wong (1999) that non dual board leadership is more common in underperforming firms that are subject to hostile takeover bid in the UK than those with CEO-duality and the result of no effect by Weir et al. (2002) for the UK, and Brickley et al. (1997) and Dalton et al. (1998) for the US firms.

Nevertheless, the evidence of the negative relation of CEO-duality and performance from this study supports the agency perspective of board leadership on the entrenchment of the CEO or executives to curb the monitoring of the directors. It is also consistent with the Code of Best Practice that recommends the split of the roles of the CEO and chairmanship of the board. The result is interesting because it is shows a unique and consistent evidence of negative relations where such empirical evidence are lacking in literature.

Board Size: The result from different models and the treatment of INO linearity or nonlinearity assumptions show mixed results on the association of board size (BSIZE) with different firm performance variables. Even the more appropriate IWLS estimation method shows mixed results regarding BSIZE, namely, significant *negative* relationship with ROA at 10% significance level, and significant *positive* relations with MTBV at 1% significance level. IWLS robust estimation also shows *positive* significant association with ROE and *negative insignificant* relationship with PER.

Nevertheless, it might be conclusive from the results in *tables 4.11, 4.12, 4.18* and *4.19* that there is *negative* association between board size and firm performance. Hence, there is yet some evidence to believe that as board size increases firm performance decreases as reported by Yermack (1995) and Eisenberg et al. (1998). The evidence supports that as board size gets larger and larger, decision takings would be slower and cumbersome (Lipton and Lorsch, 1992; Jensen, 1993; Hermalin and Weisbach, 2003). It is also in conformity with the rationale behind the recommendation of the UK Code regarding board size.

4.5.6.2 External Governance Mechanisms

Debt Financing: The results (*4.11-4.12* and *4.15-4.19)* of the relationship between debt ratio (TDTA) and firm performance using the two different models used for primary analyses show that there is *negative association* between debt ratio and firm performance, measured in ROA, ROE, and MTBV even though there is a problem of significance and consistency across performance variables and estimation methods. Nevertheless, the interesting result from *tables 4.11* and *4.12* is that TDTA has negative relation with ROA, ROE, and MTBV. This is supported by the results in *table.17* and *4.18*.

However, the result of negative association between leverage and firm performance is consistent with the findings of Vafeas and Theodorou (1998), Short and Keasey (1999), and Weir et al. (2002) for the UK firms and Dowen (1995), Agrwal and Knoeber (1996), and McConnell and Servaes (1999) for the US firms, The result is not as expected since it is inconsistent with the monitoring hypothesis of the agency perspective of debt financing, where positive relation with firm performance is expected. Nevertheless, the evidence supports the theory of financial distress related to debt financing, which suggests the negative influence of the increase in debt financing on the firm.

Takeover Intensity: The different regressions presented as *tables 4.11-4.12* and *4.15-4.19* show mixed results on the relation between takeover intensity (TOINTENS) and different firm performance measures. The only consistent result is the positive significant impact of TOINTENS on ROA. When we assume linearity of insider ownership, it is found that TOINTENS has positive relationship with ROA, MTBV, and ROE (even though not significant with ROE) for the two versions of the model. The very counterintuitive result that is very difficult to interpret is the negative significant influence of TOINTENS when linearity of INO is assumed. However, when nonlinearity of INO is assumed in one-equation setup, TOINTENS is found to be positively related only to ROA, even though it loses its significance when we use stepwise consideration of the forms of INO in the regressions. Nevertheless, despite the mixed results, considering the consistent positive relation of TOINTENS on ROA with linear and nonlinear assumptions of INO, we generally conclude and suggest that as takeover intensity increases firm performance will increase. This evidence is consistent with the study of Weir et al. (2002) on the UK firms.

Therefore, there is evidence to believe that, for the UK public firms, the higher the takeover intensity the higher is firm performance. The theoretical rationale of the positive association is that as takeover intensity increases firm performance goes up since management works hard so that they would retain their job if the firm is taken over. So, the evidence is in line with the disciplining effect of takeover market, and its monitoring role of the agency perspective. Regarding the threat of takeover (takeover intensity) to the firm and the job of CEOs, Shivdasani (1993) and O'sullivan and Wong (1999) report that the quality of NEDs significantly affects the likelihood of acquisition and Martin and McConnell (1991) and Kennedy and Limmack (1996) suggest that CEOs are likely to lose their job following hostile takeover.

4.5.7 Complementarity or Substitution Effects Analyses

The complementarity or substitution effects between governance mechanisms in monitoring the board of directors is analysed using pair-wise correlation analyses. *Table 5.10* presents the pair-wise correlation of some ownership structure and corporate governance mechanism variables used in this research. Even though, it can be observed that there are not any variables that are perfectly collinear, the significant collinearity deserves intuitive analysis of the possible interactions. This would reveal the pairwise substitution effects and complementarity effects between the governance mechanisms (Rediker and Seth, 1995).

Table 4.20: Pair-wise correlation of ownership and corporate governance mechanism variables

	ino	outo	insto	nfo	famo	banko	govo	pned	dual	bsize	tointens	tdta
ino	1											
outo	-0.065*	1										
insto	-0.105*	0.842*	1									
nfo	0.003	0.238*	-0.151*	1								
famo	0.174*	0.195*	-0.089*	-0.015	1							
banko	-0.093*	0.138*	-0.069*	-0.071*	-0.047*	1						
govo	-0.047*	0.155*	0.125*	-0.023	-0.019	0.043*	1					
pned	-0.155*	-0.007	0.013	-0.003	-0.121*	0.042*	0.125*	1				
dual	-0.072*	-0.018	-0.006	-0.008	-0.032	-0.012	0.132*	0.603*	1			
bsize	-0.054*	-0.126*	-0.157*	0.094*	-0.037	-0.000	-0.087*	-0.335*	-0.440*	1		
tointens	0.113*	0.040*	0.004*	0.072*	0.072*	-0.044*	-0.059*	-0.261*	-0.242*	0.159*	1	
tdta	-0.024	0.004	0.008	-0.013	0.003	0.006	-0.088*	-0.139*	-0.247*	0.179*	0.149*	1

* Indicates significance at 5% level.

From the correlation matrix in *table 4.20* and its summary in *table 4.21*, it can be seen that external blockholder ownerships like NFO, INSTO, NFO, FAMO and BANKO are significantly *negatively* correlated with TOINTENS and board structure (DUAL, BSIZE, and PNED). This might imply that the external governance mechanisms and the board structure might have the substitution effect on external blockholders ownership in enhancing firm performance. Regarding the correlation with takeover, Agrawal and Knoeber (1996) suggests that greater institutional ownership and bigger blocks held by outsiders might facilitate takeovers.

As in Rediker and Seth (1995), the correlation matrix shows negative and significant association between the monitoring potential of the board of directors and the incentive effects of managerial ownership (INO). This might make sense since control of the firm might also be in the hand of the management that are also part of the board structure. The correlation results might be in line with results of the regressions shown previously, which show that external blockholders ownership has significant negative association with firm performance, whereas INO has positive relation with firm performance. Furthermore, as shown from *table 4.21,* the external governance mechanisms (TOINTENS and TDTA) might have the substitution effects on board structure variables (DUAL and PNED), thus confirming Rediker and Seth (1995).

Table 4.21: Pattern of significant correlation of ownership and corporate governance variables

CORRELATION	VARIABLES	SUBSTITUTES OR COMPLEMENTS
Negative Correlation	INO	**INSTO, BANKO, GOVO, PNED, DUAL, BSIZE**
	INSTO	**NFO, FAMO, BANKO, BSIZE**
	NFO	**INSTO, BANKO, BSIZE**
	FAMO	**INSTO, BANKO, TOINTENS, PNED**
	PNED	**INO, FAMO; BANKO, BSIZE, TOINTENS, TDTA**
	DUAL	**INO, GOVO, BSIZE, TOINTENS, TDTA**
Positive Correlation	INO	**FAMO**
	INSTO	**GOVO**
	NFO	**TOINTENS**
	FAMO	**TOINTENS**
	PNED	**INSTO, BANKO, DUAL**
	TOINTENS	**INO, INSTO, NFO, FAMO, TDTA**

Source: Constructed from *table 4.20.*

Additionally, TOINTENS is complement to NFO and FAMO. The positive correlation between the proportion of nonexecutive directors and CEO-duality (PNED and DUAL) might imply that they might be complements to each other for the UK listed firms. On the other hand, *table 4.21* also shows that the takeover intense (TOINTENS) is a complement to debt financing (TDTA). The correlation pattern reveals that greater institutional ownership (INSTO) might facilitate takeover, confirming the suggestion of Agrawal and Knoeber (1996). NFO, FAMO and INO might also facilitate takeovers in the UK listed firms debt financing problems give signals.

Nevertheless, it should be noted that the pair-wise correlation analysis can only serve as a first step in the examination of complementarity and substitution effect between pairs of governance mechanisms. It cannot provide the optimal or efficient combinations of governance mechanisms that should be chosen by firms in mitigating the agency problems in listed corporations. The analysis show sounding rationale on the interdependence of governance mechanisms and indication that joint hypothesis of governance mechanism effects in contrast to independence across mechanisms.

However, the deduced effects from the observed correlations would not be enough to draw a conclusive statement unless they are supported by other analytical tools. It might be the case that the single equation modelling used in our primary or sensitivity analyses might not be enough to fully explain the interrelation between governance mechanisms and their effects on firm performance. From these facts, it is suggestive that other investigation using structural equations modelling that is estimated by 2SLS (as in Agrawal and Knoeber, 1996) or 3SLS estimation method, which is beyond the scope of this empirical study, is required to account for (1) the substitution and complementarity effects, and (2) other different sources of endogeneity problems.

4.5.8 Firm-Specific Control Variables and Firm Performance

Most of the control variables show consistent significant relationship with firm performance, measured in ROA, ROE, MTBV, and PER, and the results are as expected (*tables 4.11-4.12* and *4.15-4.19)*. From the results it is shown that firm size (TA) is *negatively* associated with firm performance measured in almost all measures. This confirms that life-cycle perspective of firms, which suggests that as firms' size increases, firm performance declines. Except for ROA, the result also shows that firm age (AGE) has a *negative* association with firm performance. Nevertheless, the *positive* association of AGE with ROA might be due to high asset tangibility and learning curve that might result in economies of scale and scope attained as firms grow and mature.

As expected, the results show the risk measure, stock price volatility (PVOL), is *negatively associated* with firm performance measured in ROA, ROE, MTBV, and PER. As it can be observed from *tables 4.11-4.12* and 4.15-*4.19*, the results are consistent for all estimation methods. Hence, there is a strong evidence (mostly at 1% significance) to believe that PVOL influences firm performance negatively. As PVOL increases, firm performance goes down due to the fall in the expectations of investors which may induce fall in prices. Hence, the research provides empirical evidence that stock market price volatility is the important determinant of firm performance.

Another consistent result provided in the study is that research and development expenses to total assets (RNDTS) has a *positive influence* (consistent with McConnell and Servaes, 1990; Short and Keasey, 1999) on firm performance, measured both in ROA, ROE, and MTBV, even though it shows *negative* relation with PER (*tables 4.11* and *4.12)*. The evidence of *positive association* at 1% significance level is very strong to suggest that it is consistent with the view that the R&D progress or break-through announcements cause the rise in the prices of the stocks and that with new products developments; and hence, firm's profits or performance in the market might increase thus raising the ROA, ROE and MTBV.

Moreover, most of the estimation methods generally and IWLS especially show results of *negative* relation between fixed assets ratio (FATS) and firm performance. From the *negative* impact of FATS on ROA, ROE and MTBV, it might be arguable that the boosting of sales, however, would not necessarily ensure the enhancement of profitability, because the expenses can increase the costs of the firm and might also lead to the decrease mainly in the accounting figures of performance (ROA and ROE) in the short-run. However, the expense in fixed assets might have positive effect on long-run firm performance.

Finally, the result provides evidence that and sales, general and administration (SGATS, which includes advertisement expenditure) has *negative* association with firm performance measured in ROA, ROE, and MTBV, and positive relationship with PER. Overall, it might be conclusive that SGATS is negatively associated with firm performance. The result of negative association is as expected because SGATS is the expense at the discretion of the management and it might be a source of agency costs that would reduce firm performance (Florackis and Ozkan, 2009).

4.6. SENSITIVITY OR CONSISTENCY ANALYSES

4.6.1 Estimation Methods for the Analyses

In order to check for the consistency of the results or evidence presented in the primary analyses, other four estimation methods are used in order to estimate the parameters for the two models. The median regression is used as a counterpart, even though not equivalent, to OLS regression. It is already noted that the median (quantile) estimation is more accurate and stronger method than the OLS in handling the data type with the problem of non-normality and outliers. The median regression, which uses the absolute value of deviation from the median (rather than the mean), thus called the least absolute deviation (sometimes called *least absolute value*, LAV), reveals that most of the predictors are strongly significant.

However, the outstanding issue after median regression eases our problem of non-normality and outliers to some extent is the heteroscedasticity and autocorrelation problems that might be prevalent. Therefore, the fixed-effects regressions (within the YEAR, YearFE; and within INDUSTRY, IndustFE) are used in order to account for differences across time and industry groups, and thus the omitted variables that would contribute to unobserved heterogeneity. Finally, the GEE, where YEAR is regarded as the categorizing variable, is used to account for the problem of heteroscedasticity and autocorrelation simultaneously and allow for the violation of the IID assumption on residuals in our modelling. However, it has not been possible to account for the INDUSTRY differences with GEE due to the limitations of matrix computation capacity of the STATA 10 software being used.

Finally, it is to be noted that median regression method is used as the benchmark of the sensitivity analysis and complemented by YearFE, IndustFE and YearGEE estimation methods. The results of the four regressions on ROA, ROE, MTBV, and PER are presented as *tables 6.1* to *6.4.* Even thought the estimations give some pattern of relationships between the predictors and firm performance, based on autocorrelation, heteroscedasticity the non-normality that violate the OLS assumptions, the GEE and the median regression methods are used as evidences of the patterns.

4.6.2 Sensitivity/ Consistency of the Results

Tables 4.22-4.26 show the regressions for the sensitivity and consistency of the results on the two models. We would like to note that even thought the F-test and Wald test statistics show a good fit of the model as a whole, the R^2 and *adjusted* R^2 are found to be still low. In general, it is interesting to note that almost all of the explanatory variables (predictors) that are significant in the robust estimation methods are found to be significant in almost the same manner or pattern in the methods used for sensitivity analysis. So, rather than going into the details of the story of the results it is chosen to present summary notes in order to avoid repetitions. The theoretical and real world situation interpretations of the results of the methods are also the same and need not be repeated.

Insider Ownership: *Table 4.22* in *Appendix C* presents results of different estimation methods assuming nonlinearity of INO in one-equation setting. As it can be observed from the table, generally INO and other ownership variables do not have significant relation with ROA. This might be from the spurious relationships that result from the inclusion of INO, INO^2 and INO^3 that have the problem of multicollinearity as previously discussed. The linear INO has significant relation with ROA only when within industry fixed-effects (IndustFE) estimation is used.

Table 4.23 presents the results of median stepwise regression with nonlinearity assumption of INO. The evidence on insider ownership observed from the *table* confirms that that INO, INO2 and INO3 are strongly (at 1% significance level) *positively* associated with ROA. Consistent with the primary analysis, this evidence confirms (1) the nonlinearity assumption of the association of managerial ownership to firm performance, (2) the alignment of interest hypothesis of the agency theory on insider ownership, and (3) the diminishing marginal productivity as INO increases, which can be observed from the magnitude of the coefficients of INO with the orders of the polynomials.

Table 4.23: Regression with nonlinear assumption of insider ownership in stepwise setting on ROA using median estimation methods the first and second models

	Model 1			***Model 2***		
Median regression on ROA						
Variable	INO	INO2	INO3	INO_A	INO2_B	INO3_C
ino	0.0196**			0.0198***		
insto	-0.0092**	-0.0092**	-0.0093**			
nfo	0.0028	0.0011	0.0010			
famo	-0.0074	-0.0078	-0.0078			
banko	-0.0309**	-0.0305**	-0.0304**			
govo	-0.0173	-0.0184	-0.0187			
pned	-2.3873***	-2.4403***	-2.4450***	-2.3839***	-2.4691***	-2.4764***
dual	-2.7296***	-2.7269***	-2.7269***	-2.6812***	-2.7326***	-2.7314***
bsize	-0.1137***	-0.1195***	-0.1203***	-0.1067***	-0.1175***	-0.1182***
tointens	4.4922***	4.6933***	4.7247***	4.6627***	4.6925***	4.6972***
tdta	-0.0049	-0.0048	-0.0048	-0.0042	-0.0047	-0.0047
ta	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***
age	0.0045**	0.0044*	0.0044**	0.0044**	0.0045**	0.0046**
rndts	0.0008***	0.0008***	0.0008***	0.0008***	0.0008***	0.0008***
fats	-0.0022	-0.0023	-0.0023	-0.0022	-0.0023	-0.0023
sgats	-0.0097***	-0.0094***	-0.0093***	-0.0094***	-0.0093***	-0.0092***
roat1	0.3479***	0.3484***	0.3485***	0.3527***	0.3521***	0.3521***
ino2		0.0004**			0.0004**	
ino3			0.0000*			0.0000**
outo				-0.0090***	-0.0087**	-0.0087**
_cons	7.0745***	7.1508***	7.1619***	6.9153***	7.1006***	7.1082***
					legend: * p<.1; ** p<.05; *** p<.01	
Pseudo R^2	**0.1525**	**0.1525**	**0.1525**	**0.1520**	**0.1520**	**0.1520**

Note: As indicated in the *legend:* * indicates significance at 10% level; ** indicates significance at 5% level; *** indicates significance at 1% level.

INO is linear assumption of managerial ownership; INO2 is quadratic assumption of managerial ownership; and INO3 is cubic assumption of managerial ownership for the first model. INO_A is the linear assumption of managerial ownership; INO2_B is quadratic assumption of managerial ownership; and INO3_C is cubic assumption of managerial ownership for the second model.

Moreover, *tables 4.24-4.26 (table 4.26 is in Appendix C)* present results of different estimation methods with the assumption of linearity of INO. From the *tables* it can be observed that the results of the median and GEE estimation methods, which is a reliable estimation method since it accounts for both IID problems, show evidence that INO is *positively* related to ROA, ROE and MTBV (though not significant with MTBV when GEE is used). It can be noted that the results of the fixed-effects estimation methods indicate that INO has *positive* relation with ROA, ROE and MTBV (though insignificant with ROE and MTBV). Consistent with the analysis in the previous section, it is to be noted that (1) the relationship between INO and performance might not be linear, and (2) the positive relation of INO confirms the alignment of interest hypothesis.

Table 4.24: Regressions on ROA and ROE using YearFE, IndustFE, Quant50, and YearGEE estimations of the first model

ROA

Variable	YearFE	IndustFE	Quant50	YearGEE
ino	0.0595***	0.0563***	0.0218***	0.0597***
insto	0.0023	-0.0008	-0.0062*	0.0013
nfo	-0.0258	-0.0116	0.0053	-0.0219
famo	-0.0220	-0.0110	-0.0090	-0.0229
banko	0.0351	0.0231	-0.0310**	0.0312
govo	0.0034	-0.0048	-0.0271	0.0069
pned	-2.3376*	-1.6189	-2.1548***	-2.3620**
dual	-2.3738***	-1.0513	-3.1175***	-2.4087***
bsize	0.0375	0.0157	-0.0982***	0.0318
tointens	9.4610**	2.8972	3.7449***	9.1225
tdta	-0.0198*	-0.0265**	-0.0066*	-0.0199
pvol	-0.0810***	-0.1255***	-0.0426***	-0.0825
ta	-0.0000*	-0.0000	-0.0000***	-0.0000*
age	0.0055	0.0018	0.0040**	0.0054*
rndts	0.0014***	0.0012***	0.0008***	0.0014***
fats	-0.0030	0.0030	-0.0034**	-0.0029
sgats	-0.0171***	-0.0150***	-0.0091***	-0.0170***
roat1	0.2647***	0.2470***	0.3397***	0.2648*
_cons	8.2434***	9.6621***	8.0825***	8.3895**

legend: * p<.1; ** p<.05; *** p<.01

R^2	0.1396	0.1049	0.1631	-

ROE

Variable	YearFE	IndustFE	Quant50	YearGEE
ino	0.0817	0.0728	0.0418***	0.0916**
insto	-0.0974*	-0.0846	-0.0259***	-0.0910**
nfo	0.2141*	0.2553**	0.0042	0.2638**
famo	-0.1432	-0.1092	-0.0186	-0.1523
banko	0.1192	0.1414	-0.0258	0.1002
govo	0.5780	0.4243	-0.0798	0.5246
pned	-14.1574**	-7.9797	-6.1584***	-11.8088***
dual	-6.3309**	-1.9620	-9.1774***	-7.6283**
bsize	0.9020**	0.9000***	0.0747	0.7799**
tointens	8.7999	-7.1442	-4.5544*	1.7812
tdta	0.0258	0.0297	-0.0234***	0.0285
pvol	-0.2805***	-0.4307***	-0.0989***	-0.3074***
ta	-0.0000**	-0.0000	-0.0000	-0.0000***
age	-0.0283	-0.0448*	-0.0034	-0.0310***
rndts	0.0021	0.0018	0.0016***	0.0022***
fats	-0.0441**	-0.0247	-0.0277***	-0.0429
sgats	-0.0230	-0.0198	-0.0175***	-0.0238***
roet1	0.1662***	0.1614***	0.2225***	0.1689
_cons	27.1955***	27.2640***	19.9919***	28.0318***

legend: * p<.1; ** p<.05; *** p<.01

R^2	0.0841	0.0682	0.1591	-

Note: As indicated in the *legend:* * indicates significance at 10% level; ** indicates significance at 5% level; *** indicates significance at 1% level.

YearFE is fixed effect regression for time differences; IndustFE is fixed regression for industry differences; Quant50 is median regression; and YearGEE is general equations estimation regression taking year as categorizing factor.

Table 4.25: Regressions on MTBV and PER using YearFE, IndustFE, Quant50, and YearGEE estimations of the first model

MTBV

Variable	YearFE	IndustFE	Quant50	YearGEE
ino	0.0521	0.0480	0.0076***	0.0691
insto	0.0414	0.0530	-0.0007	0.0510
nfo	0.0349	0.0775	0.0022	0.0853
famo	0.0264	0.0192	-0.0077***	0.0252
banko	-0.0232	-0.0254	-0.0002	-0.0231
govo	-0.0490	-0.1863	-0.0119	-0.1254**
pned	-11.6178	-9.2375	-0.3673***	-8.0623
dual	2.0222	-0.7640	-1.1764***	-0.3121
bsize	0.1424	-0.1989	0.0223***	-0.1082
tointens	28.2036	7.0915	-0.0521	12.1624
tdta	-0.1526*	-0.1476*	-0.0005	-0.1478
pvol	-0.2250	-0.2734*	0.0051***	-0.2723
ta	0.0000	0.0000	-0.0000***	0.0000
age	-0.0058	-0.0127	-0.0001	-0.0096
rndts	0.0028	0.0026	0.0019***	0.0029***
fats	0.0057	0.0049	-0.0035***	0.0061
sgats	-0.0117	-0.0084	-0.0000	-0.0135
mtbvt1	0.0098	0.0077	0.0062***	0.0098
_cons	12.8451	17.4091	2.2068***	15.3770

legend: * p<.1; ** p<.05; *** p<.01

R^2	0.0256	0.0259	0.1017	-

PER

Variable	YearFE	IndustFE	Quant50	YearGEE
ino	-0.2753	-0.2638	-0.0037	-0.2922
insto	-0.1376	-0.0788	0.0035	0.0720
nfo	-0.6355	-0.6617	-0.0162	-0.9709*
famo	0.0682	0.0413	-0.0490**	0.3326
banko	-0.3457	-0.2080	-0.0039	0.3722
govo	-0.6987	-0.8305	1.5644***	-0.9254
pned	77.1855*	80.2494*	3.3690***	96.4108***
dual	48.9373**	39.7223*	12.0219***	44.4356***
bsize	-0.7026	-1.0753	-0.0241	-0.7202
tointens	-76.7915	-63.4125	-4.1122	-58.8519
tdta	0.0203	0.0742	-0.0244***	0.0420
pvol	0.3833	0.5277	-0.0064	0.3497
ta	-0.0000	-0.0000	-0.0000**	-0.0000
age	-0.2599	-0.2622	-0.0002	-0.2422
rndts	-0.7530	-0.3331	0.0109	-0.7768
fats	-0.0072	-0.0553	0.0219***	-0.0750*
sgats	0.4748*	0.4560*	0.0472***	0.4220
pert1	0.2668***	0.2672***	0.3938***	0.2688*
_cons	-15.5738	-19.2772	8.7579***	-33.7117*

legend: * p<.1; ** p<.05; *** p<.01

R^2	0.0526	0.0420	0.1388	-

Note: As indicated in the *legend:* * indicates significance at 10% level; ** indicates significance at 5% level; *** indicates significance at 1% level.
YearFE is fixed effect regression for time differences; IndustFE is fixed regression for industry differences; Quant50 is median regression; and YearGEE is general equations estimation regression taking year as categorizing factor.

External Block Ownership: The median regression results presented as *table 6.24* and *6.26* reveal evidence of *negative* association of INSTO and negative relation of BANKO on ROA. Additionally, *the tables* show that INO has *negative* relationship with ROA, ROE, MTBV and PER (though not significant with PER). It is also confirmed that NFO has *positive* significant relationship with ROE according to fixed-effects and GEE estimations, even though it is surprising to observe the GEE result showing *negative* significant relation of NFO with PER. The result of the median regression confirms also that family ownership (FAMO) has *negative* significant relationship with MTBV and PER. Furthermore, the median regression result shows that BANKO has *negative* significant relation with ROA.

Finally, as it can be seen from *table 4.26*, the median regression results show that OUTO (the aggregate ownership all external blockholders) is found to exhibit consistent negative significant relationship with ROA, ROE, and MTBV. Hence, the evidence on external blockholders ownership (OUTO) and its components (INSTO, FAMO, and BANKO) confirms the previous result on the second-order agency problem and the expropriation hypothesis regarding control by external blockholders.

Board Structure and External Governance Mechanisms: More interesting evidence is that the board variables, PNED and DUAL, still have similar strong consistent *negative* influence on ROA, ROE, and MTBV (*tables 4.22-4.26*). In contrast to the primary analyses, BSIZE now show strong *negative* relations with ROA for median regression estimation methods as shown from *table 6.3.* Contrary to this, BSIZE has *positive* relationship with ROE according to the results the two fixed-effects and GEE estimations and with MTBV according to the result of median regression. These results are confirmed in *table 4.26,* and this indicates the consistency across the two models, which is interesting.

The external governance mechanism variables – TOINTENS and TDTA – also generally show results similar to the primary analyses even though there are differences across estimation methods. Furthermore, the firm specific control variables and the lagged performance variables also show the consistent pattern of relationship across the two models and similar evidence as in the primary analyses.

Fixed Effects: The fixed-effects regressions results indicate that most of the predictors have significant relation with firm performance. They show the effects of the predictors based on the differences in factors (year and industry differences) that are economically remarkable. In fixed-effects regression, it is supposed that separate regressions for each factor are made, and then the coefficients are averaged across the factors. Each individual or factor serves as its own control. Even though FE methods reduce bias, the consequence is that the standard errors tend to be larger than random effect or GEE.

The within-year FE (YearFE) regression shows that INO, PNED, DUAL, TOINTENS, TDTA, PVOL, TA, RNDTS, SGATS, and ROA_{t-1} that are significant according to median regression still retain significant relation with ROA, thus implying there are *no year difference effects* regarding the predictors. INSTO, BANKO, BSIZE, AGE, and FATS that are significant with median regression, however, show insignificant relationship with ROA according to YearFE estimation and this indicates that there is *fixed effects* from the differences in years for the indicated variables.

Finally, the industry FE estimation show that the variables like INO, TDTA, PVOL, RNDTS, SGATS, and lagged ROA that are significant in median regression retained their significant relation with ROA there are *no industry effects* regarding the variables. INSTO, BANKO, PNED, DUAL, BSIZE, TOINTENS, TA, AGE, and FATS that are significant according to median regression have no significant relation with ROA, thus indicating that there is *fixed effects* from the differences in industry.

4.7. DISCUSSION AND CONCLUSION

In this empirical study we investigated and analysed whether there is positive or negative relationship between ownership structure and firm performance by controlling for the governance mechanisms and other environmental factors using a panel data. Its main finding is that there is a positive or negative relationship between ownership structures, measured in proportion of shares held by blockholder categories (insider ownership, and external ownership and its component categories) and firm performance, measured in ROA, ROE, MTBV, and PER.

Moreover, from the observed few differences in the results of the regressions on different performance variables, it might be also suggestive that the accounting measures of firm performance (ROA and ROE) give more systematic pattern than valuation based measures (MTBV and PER), especially when many of the explanatory variables come from accounting data of variables. Even though there is some similarity of the patterns of the relationship of ownership variables with both types of performance measures. The differences in results between accounting and market based performance measures might also arise from the possible manipulations of accounting values and the intended signalling announcements by the management. Hence, it might be suggested that the influence of the values of the market measures coming from the combination of the accounting information and other corporate public information might lead to some unsystematic pattern of effect on MTBV and PER. Thus, contrary to the suggestions of the market efficiency theory, the market values might differ from the expected value of the reported accounting earnings or income.

The consistent evidence of this research is that there is *positive* nonlinear relationship between insider ownership (INO, INO^2 and INO^3) and firm performance, thus supporting the alignment of interest hypothesis. The evidence does not support theoretical reasoning of interest alignment-entrenchment or alignment-entrenchment-alignment hypotheses suggested by Stulz (1988), which is supported empirically by Morck et al. (1988), McConnell and Servaes (1990) and Short and Keasey (1999). However, caution is required in the interpretations since (1) the positive results might arguably be the resultant average outcome of positive and negative relations, hence incentive and entrenchment that might work at the same time at higher ownership level, and (2) the methodology used has accounted for multicollinearity of insider ownership in nonlinearity assumption, even though it has not accounted for the piece-wise estimation for some ranges of managerial ownership and for different sources of endogeneity, and (3) the panel data and the aggregate of ownership of executive and non executive directors used in this research cannot be compared with the studies that used cross-sectional data and only executive ownership respectively.

To sum up, the insight from the study is that the decreases in the positive coefficients of the linear insider ownership, square of insider ownership and cube of insider ownership might suggest evidence of the rise in the alignment of interest at a decreasing rate, thus exhibiting the diminishing marginal productivity of the firm as managerial ownership increases. It might also be argued that the reduced rate of performance with the different roots of the polynomial might indicate the potential for both an incentive and an entrenchment effect, which are supposed to happen at the same time with one outweighing the other after a certain degree of ownership level. Hence, it might be suggestive that the reduced rate of performance could be due to the increasing impact of the entrenchment effect which reduces the positive benefits from the incentive alignment effect.

Moreover, NFO also has positive relation with firm performance. This might suggest that both INO and NFO, which are also directed by management, enhance firm performance. It is arguable that INO and NFO might enhance firm performance because the decisions or actions of the nonfinancial owners are also undertaken by the directors. The evidence supports the similarity of behaviour of INO and NFO regarding the trends of ownership overtime as investigated in Part One of this Research Thesis, which show that they follow the same pattern generally and particularly during the eve of the current global financial crisis (2006-2007).

Furthermore, there is also evidence that ownership of the components of aggregate external blockholders also influence firm performance. There is *negative* association between INSTO, FAMO, and BANKO and firm performance. Their aggregate outsider ownership (OUTO) is found also to have a *negative influence* on firm performance. The interpretation of this might be that individual external blockholders categories (INSTO, FAMO, BANKO, and GOVO) or their aggregate (OUTO) tend to decrease firm value due to the private benefits of control when they are controllers in terms of their voting rights or when they form collusion for control, thus leading to the second-type of agency problem, and necessitating investor protection (Shleifer and Vishny, 1997; La Porta et al., 2000). The evidence might suggest the conflict-of interest hypothesis and the strategic-alignment hypothesis on institutional owners and the appropriation hypothesis on family or individual household, and bank, thus confirming the second-type agency conflicts.

Moreover, regarding the assumption of endogeneity, the results show consistent evidence as in Weir et al. (2002) that the lagged performance variables significantly influence the current performance. The insight is that depending on the previous performance of the firm, investors might be influenced to increase or decrease their ownership stake in the company. This might be also related to the positive relation between inside block ownership and firm performance, where it might be arguable that block ownership might also be driven by firm performance.

Interestingly, the board variables, PNED, DUAL and BSIZE, have consistent *negative* relation with ROA and ROE. The result on PNED is inconsistent with the monitoring hypothesis of the agency theory. However, it supports the argument that NEDs might have negative association with firm performance since they are part-timers, sit on multiple boards and lack complete information for decisions when compared to EDs (Bozec, 2005). It can also be argued that the NEDs, which are part of the management, could be utility maximizers and cooperate with the executive managers for private benefits of control which might lead to negative performance and that not all NEDs are independent directors. Moreover, it might also be suggestive that other external governance mechanisms might have a complementary or substitution effects on NEDs to enhance firm performance. Finally, it can be added that the endogenous relationship between board of directors and firm performance, where current board characteristics is affected by past performance might also affect the result. Hence, the negative influence of PNED on performance does not necessarily imply that the recommendations of the UK Code of Best Practices on directors' independence and the number of NEDs are wrong. Therefore, it is suggestive that a further research with a better methodology that accounts for endogeneity problems might reveal reliable evidence on the effect of PNED on firm performance.

Moreover, consistent with the agency perspective regarding the board leadership on the entrenchment of the CEO or executives that are with the ability to curb the monitoring role of the directors and the rationale behind the UK Code of Best Practice that recommends the split of the

roles of the CEO and chairmanship of the board, the results shows strong evidence of *negative* influence of duality (DUAL) on performance. This finding fills the empirical gap by providing evidence that supports the rationale behind the Code's recommendations on the separation of the roles of the CEO and the Chairman. Finally, board size is found to have a *negative* relation with performance consistent with the reports of Yermack (1995) and Eisenberg et al. (1998) and confirming the viewpoint of effective functional boardroom size and the rationale behind the recommendation of the UK Code.

As for other governance mechanisms, all of the variables selected show significant relationship with performance. The evidence show that debt financing (TDTA) is negatively related to ROA, ROE, and MTBV as observed in the primary analyses and confirmed in the sensitivity analyses. The evidence is in contrast to the monitoring hypothesis of the agency perspective of debt financing, where positive relation with firm performance is expected. However, it supports the theory of financial distress related to debt financing, which suggests the negative influence of the increase in debt financing on the firm.

Finally, there is *positive* influence of takeover intensity on ROA consistently, and on ROE and MTBV inconsistently. This is consistent with the results of the study of Weir et al. (2002) on the UK firms. The theoretical rationale of the positive association is that as takeover intensity increases firm performance goes up since management works hard to avoid takeover or so that they would retain their job if the firm is taken over. So, the evidence is in line with the disciplining effect of takeover market, and its monitoring role *per se* the agency perspectives.

The discussions above assessed the evidence on the impact of individual predictor (independent) variables on firm performance, taking others constant. Nevertheless, drawing conclusion on the way the system of corporate governance works being based on the individual estimates provided by the empirical analyses might be misleading. Since corporate governance is a system of different governance arrangements, it would be wise to consider that alternative mechanisms always exist working together or in different direction in mitigating the agency problems between managers and shareholders. The use of one governance mechanism might depend on the use of other alternatives (Agrawal and Knoeber, 1996). Hence, the following insights are derived from the correlation analysis of pairs of governance mechanisms, which is used as an elementary procedure to shed light into the complementarity and substitution effects between the governance mechanisms.

The external blockholder ownerships like NFO, INSTO, NFO, FAMO and BANKO are significantly *negatively* correlated with TOINTENS, DUAL, BSIZE, and PNED might imply that the external governance mechanisms and the board structure might have the substitution effect on external blockholders ownership in enhancing firm performance by exerting their monitoring role.

The correlation analysis shows that TOINTENS is complement to NFO and FAMO, suggesting that NFO and FAMO might facilitate takeover to mitigate the agency problems and enhance firm performance. The positive correlation between nonexecutive directors and CEO-duality (PNED and DUAL) might imply that they are complements to each other. Additionally, the pair-wise correlation shows that takeover intensity (TOINTENS) is a complement to debt financing (TDTA). However, the pair-wise correlation analysis cannot be a reliable procedure that is robust enough to arrive at conclusive statements regarding the complementary or the substitutive effects between the governance mechanisms.

Nevertheless, the study has its limitations. Firstly, one might argue that there might be specification error or omitted variables due to the lower R^2. Since (1) the overall model fit is good, (2) one test indicated that there is no such a problem though the other shows the opposite, (3) literature show that researchers in economics live up with lower R^2, (4) we are concerned with the significance of the relationship rather than the magnitude of the coefficients, and (5) we use non-OLS methods for estimation, we believe that the results are still acceptable.

Secondly, the methodology falls short of undertaking the appropriate handling of endogeneity of non-ownership variables like board of directors (pairwise correlation analysis used is not robust). We suggest the further research with the structural system of equations or structural equations modelling, where 2SLS or 3SLS or other estimations methods of instrumental variables are utilized.

Thirdly, the model has limitation in that it has not accounted for the possible reverse causality between ownership structure and board structure on the one hand and firm performance on the other hand; and this can appropriately be accounted for by using structural equation modelling.

Fourthly, the financial analysts that have the monitoring role on the management of firms is not accounted for in the analysis due to the lack of proper data on it.

Finally, since the results are based only on the use of 3% threshold, it must be noted that the results would definitely be different with higher thresholds that produce different blockholder ownership levels for different owner categories as previous studies on the UK listed firms have shown (Franks et al., 2001; Marchica and Mura, 2005; Florackis and Ozkan, 2009). Finally, since this study suggests that there is the second-order agency problem in the listed UK firms, it is recommended to undertake further research on the association of blockholder structures with firm performance in the control dominance and contestability perspectives.

To sum up, the research has its contribution to knowledge since it provides (1) the most updated evidence on the relationship between ownership structure measured in several ways and firm performance in the major UK public companies, and (2) consistent evidence on the development and influence of some of the UK board structures on firm performance since the Higgs Report of 2003. It also provides a clue into the direction of further research about the control structure in corporations.

CHAPTER FIVE
CORPORATE CONTROL STRUCTURES AND FIRM PERFORMANCE: EVIDENCE ON CONTROL DOMINANCE-CONTESTABLITY PERSPECTIVES FROM THE UK

5.1. INTRODUCTION

Most listed firms, in reality, have multiple blockholders and share ownership is concentrated in the hands of a small number of large shareholders in the UK, the US and Continental Europe (Demsetz and Lehn, 1985; La Porta et al., 1999; Zwiebel, 1995; Becht and Roel, 1999; Barca and Becht, 2001; Becht and Mayer, 2001; and Holderness, 2007). Even so, the common notion characterizing ownership of modern listed firms is that they are widely distributed in market-oriented countries like the UK and the US. For the UK, the prevalence of a number of significantly large blockholders has been reported (Marchica and Mura, 2005).

The evidence of the prevalence of multiple blockholders questions the universality of the Berle and Means (1932) separation of ownership and control hypothesis and the applicability of the principal-agency theory (Jensen and Meckling, 1976) to closely held firms with several blockholders. It has shifted the focus from the traditional conflict of interest between shareholders and managers to another agency conflict between large controlling blockholders and minority shareholders (Shleifer and Vishny, 1986, 1997; Holderness 2003), referred to as the second-order agency conflict. Demsetz and Lehn (1985) were the first to establish the second-order agency problem in listed corporations. We define large controlling blockholders as shareholders that have the potential ability to exert control pressure in terms of voting power that derives from their cash flow right in their firm relative to the remaining firm's blockholders. It is assumed that multiple large shareholders might have more chance to be elected or represented in the board of directors or exert their monitoring role as external blockholders in order to influence firm's decision process and strategy formulation.

The existing viewpoint on the impact of large controlling blockholders is variable. On the one hand, it is stated in literature that they can benefit minority shareholders by monitoring managers (Shleifer and Vishny, 1986, 1997). On the other hand, it is suggested that large controlling blockholders can be harmful if they pursue their own private benefits or goals that diverges from shareholder value maximization or if they reduce the valuable managerial incentives (Shleifer and Vishny, 1997; Burkart et al., 1997).

Previous studies approached the impact of blockholders considering mainly the dominant shareholder concept. The work on the impact and role of multiple large blockholders is scant and new. Yet, little is known about blockholders structures, namely, the way controlling blockholders interact with each other and how they share power among themselves in controlling the firm or contesting the controlling large blockholders. This paper will try to address both by giving more focus on the impact of multiple blockholders assuming that control might always be dominated and/

or contested by a single blockholder or coalitions of blockholders. Our premise is that the presence of multiple large blockholders concentrates corporate share ownership and hence voting power that enables to exert pressure to dominate the firm's decisions and/ or to contest the incumbent dominant force controlling the firm; it also increases the number of blockholders that might play in the control contest in the firm. Moreover, the formation of coalitions of blockholders also leads to ownership or voting concentration that gives the potential ability and incentives to exert control pressure.

Hence, the important questions for this research are: *What are the effects of the ownership concentration and the control rights and power attached to ownership stakes of a large blockholder or coalitions of blockholders on firm performance? How do large and multiple blockholders interact or how do they share power among themselves? What forms of blockholders' structure enhance firm performance?*

The motivating background of this research is the UK corporate governance reform and regulatory framework that encourages shareholders to exercise their responsibilities as owners at annual meetings of shareholders mainly since the Cadbury Report of 1992 following financial crises of 1990s that raised public concerns and led to criticisms on managerial greed. The report encourages shareholders to exercise their vote and to change their passive approach of exiting the firm by selling their stakes to monitoring management (Chakravarty and Hodgkinson, 2001). Similarly, the Hampel Report (1998) encouraged shareholders to make judgments and to vote. The series of such corporate governance reforms in the UK, including Greenbury Report (1995) and the Myners Report (1995), encouraged shareholders, particularly institutional investors, to seek long term strategy rather than short term exit, thus calling for more activism. They emphasized that blockholders use or cast their voting power effectively. However, despite the call for activism, even though there had been an increase in vote casting by institutional investors up to the end of 1990s (Mallin, 1996, 1999), the proportion of votes casted remained under 40% (Hampel Report, 1998).

The recent relevant corporate governance reform undertakings, the Higgs Report (2003), reemphasized the split of CEO-duality; made radical suggestion that at least half of the directors should be NEDs; over-emphasized the earlier Code's suggestion of the monitoring role of the NEDs; encouraged the relationship of the board with shareholders, thus linking the role of NEDs and the role of institutional investors; included the definition of 'independence' of directors; and expanded the role of the senior independent director to provide an alternative channel to shareholders and lead evaluations of the chairman's performance. The cumulative developments in the governance initiatives that culminated in the Higgs Report (2003) and the Smith Report (2003), which lays guidance on audit committees, led to the changes in the Combined Code of Corporate Governance published in July 2003. Hence, the Higgs Report and the Combined Code of 2003, which incorporated the principles of the Higgs Report, Smith Report and previous Codes, have the motivating impact on controlling for the internal governance mechanism in this research. The Code also provides that they should apply the principles set by the Institutional Shareholders' Committees (ISC) in "*The Responsibility of Institutional Shareholders and Agents – Statement of Principles*" published in 1991. Agents of institutional investors (trustees) are investment managers or voting services that are appointed by the institutional shareholders to act on their behalf. A research made on the institutional investors that led to the publishing of The Myners Principles (2001), and the Myners

Reviews (2004, 2007) on the Principles show the greater progress in activism and engagement of institutional investors.

Shareholder activism might be defined as the actions of intervention by shareholders to influence corporate management and boards. The actions of active investors might be: to vote for or against management, or threatening the sale of shares and exiting or put pressure on management to take or refrain from various actions (force the spin-off of business, block takeovers, limit directors pay or fire directors, force a change of strategy, and impose corporate social responsibility policies) as a way of dealing with agency problems (Gillan and Starks, 1998; Becht et al., 2008). In some cases, shareholder activism might also be directed against external large shareholders; and it can be collaborative when it is conducted in private or disruptive when it is in public. Of all forms, the exercise of voting power attached to the ownership rights of blockholders is an important form of activism considered for the purpose of this research.

Hence, it is vital to make the conceptual definition of ownership concentration and blockholders structure from the perspective of firm control. In defining ownership concentration and blockholders structure in terms of control perspectives, we might need to make distinctions between significant blockholders, controlling blockholders, dominant blockholders or contesting blockholders for the purpose of this research. We define *ownership concentration* in terms of the size of ownership stakes held by all significant blockholders (ABHO) and the number of all investors that have more or less large blocks of stake in the firm (*blockholder concentration*, NBH). Wruck (1989) writes that ownership concentration is based on the share ownership of managers and beneficial owners at the disclosure level. Ownership concentration is important factor affecting relations between large blockholders and management of the firm (Leech, 1988).

Hence, the identification of *significant blockholders* that are defined as those that own identifiable blocks of shares above the UK disclosures rule might be used as a basis in measuring ownership concentration. Since the magnitude of blocks of shares held by significant blockholders varies, all of them might not be able to exert enough control pressure equally; and all significant blockholders cannot be controlling or dominant blockholders equally. *Controlling blockholders* are significant shareholders that own highly significant blocks of shares that might give the ability to assume and exert effective control pressure that influence firm's decision-making than others. They are shareholders that might dominate votes taken at company meetings where ownership is highly concentrated (Leech, 1988). In the UK, a blockholder or group of blockholders owning at least 30% of the outstanding shares of a firm in the UK are bound to mandatory takeover rule that gives influencing control over the firm. Where ownership concentration is low, dominance by the major controlling blockholders is absent (Leech, 1988) and control of the firm contested. In the UK, where ownership is diffuse, the blockholders that have the control potential might either be *dominant blockholders*, which have voting rights that might dominate firm's decision making, or *contesting blockholders,* which might exert the monitoring control on the behaviour and actions of dominant or controlling blockholders or the management.

Regarding corporate control and blockholders structure, the existing few theoretical models or frameworks that explain the relationship among large multiple blockholders that have potential power of control could not underpin the possible arts of control games in the coalition for control and the contestability of control (Zwiebel, 1995; Bennedsen and Wolfenzon, 2000). Hence, the

research uses the existing scant and few theoretical frameworks in order to analyze the contestability of control in the presence of controlling blockholders by taking into account the costs and benefits of control. Hence, it investigates the different possible forms of blockholder structures and their impact on firm performance using a panel data coming from the UK FTSE All Share Index companies between 2003 and 2007. It considers contestability of control following Maury and Pajuste (2005) and Gutierrez and Pombo (2009). However, it differs from the studies in that it (1) simultaneously analyses control contestability and control dominance believing that analyzing only control contestability would mean not accounting for the opposing factor that has impact on both contestability and performance, (2) considers collective action and coalitions of blockholders, (3) includes board structure, and (4) uses structural equations modelling in order to determine several control factors and firm performance in order to account for the different forms of endogeneity problems within the framework.

Hence, in addressing the issue of corporate control, we use mainly two concepts in this research, namely control dominance (and monopolizability) and control contestability. *Control dominance* is a control setting in which the corporate control is dominantly controlled by a single blockholder or coalitions of blockholders that have enough voting rights to exert effective control pressure and dictate their proposals in decision-making process. *Monopolizability of control* might be defined as the extent to which control might be monopolized by a coalition of groups of blockholders. It is assumed that attempts of monopolizing might arise as a counter to the undertaking of contests to the power of the incumbent dominating control force. *Control contestability* is a control set up in which a large blockholder or coalitions of blockholders contest the incumbent controller by exerting monitoring pressure or pose pressure to gather enough voting rights to make threats to take a dominant position. The research assumes these two opposing control forces arise, co-exist, change and disappear together in the control configuration of the firm.

The empirical findings of this research are of two folds. Firstly, the evidences support the existing agency theory and hypotheses on the determinants of firm performance. The evidence of positive impact of takeover, and of consistent negative impact of PNED on current return on assets (ROA) confirms the empirical validity of (a) the agency theory on the role of takeover market as a monitoring and disciplining role of external governance mechanism, and (b) the hypothesis that takeover is a *substitute* for internal governance mechanism. The result that debt financing reduce firm performance empirically supports the theory of financial distress. There is also evidence that debt financing and stock markets have *complementarity effect* with CEO-duality. Moreover, the result confirms *dynamic endogeneity hypothesis* showing that lagged ROA has positive impact on current ROA and negative impact on CEO-duality. Furthermore, the *negative* consistent impact of takeover intensity on both the proportion of non-executive directors (PNED) and CEO-duality while having positive impact on ROA might suggest evidence for the *substitution effects* of takeover on the board of directors.

Secondly, there is the evidence that supports the empirical validity of *control dominance and contestability hypothesis* on blockholders' structure and the monitoring role of contestability of control for UK listed firms. The results show evidence that contestability factors dominate over their corresponding dominant factors and they enhance firm performance (ROA); and this provides the empirical validity of *control contestability hypothesis* for the UK listed firms. Moreover, the evidence shows that contestability variables enhance the proportion of nonexecutives in the board and

diminish CEO-duality, which is found to reduce firm performance, thus, confirming the empirical validity of the rationale behind (1) the monitoring hypothesis of the agency perspectives on board structure, and (2) the recommendations in the UK Code of Best Practice on board structure. The opposite impact of dominance factors (positive impact) and contestability factors (negative impact) on CEO-Duality is another evidence of control dominance and contestability perspectives.

Hence, the research contributes to the existing debate on the how large blockholders interact and share power among themselves. It expands the existing theoretical models of control contestability into the model of control dominance (including monopolizability) and contestability, by considering the interaction of dominance and contestability in the equilibrium in a wider system of structural equations model. It confirms that a framework of structural equations model (SEM) that incorporates the internal governance mechanisms (board structure), control dominance and contestability factors and external governance mechanisms is a suggestible methodology required to analyze how control of listed firms is determined and their impact on firm performance. The simultaneous consideration of control dominance and contestability framework together with other control factors empirically sheds light into the blockholders structure and the way they interact and share power in controlling and monitoring firms and determining performance of widely held corporations. The other contribution to knowledge of the research is that it provides evidence from the UK listed firms confirming the *dominance and contestability of control hypothesis*, namely that control is contestable and that dominance and contestability of control structure determines board structure and performance.

Finally, the rest of the *Chapter* is organized as follows. *Section 5.2* shades light into the background of the research issue with respect to the UK case and literature review relevant to the issue of dominance and contestability of control. *Section 5.3* deals with the theoretical frameworks or models regarding control dominance and contestability and the empirical implication of the model. Following that *section 4* deals with hypotheses development and formulation that ensue from the theoretical and empirical models and finance literature. In *section 5.5* presents the methodology which identifies the sample and data, variables used in the analysis, model specifications, and estimation methods. *Section 5.6* presents the results and the analyses. Finally, *section 5.7* provides the conclusion ensuing from the study.

5.2. LITERATURE REVIEW

5.2.1 Review of the Background of the UK Case

The issue of blockholders' structure, as already mentioned, is important in the UK corporate control because the share ownership in listed firms is dispersed in small parcels amongst large number of shareholders and there are several significant blockholders with shareholdings that are close to each other. We assume that all shareholders holding more than the disclosure level (3%) of the UK listed firm's outstanding shares are significant blockholders since they carry the voting power that can make changes in the balance of power or decision-making process when voting coalitions (blocks) are formed. The provisions in the UK allow minority shareholders protection, in which even lower voting-blocks matter a lot. The UK City Code on Takeovers and Mergers requires that 15% or more votes of a firm must declare own intentions about making a takeover move. Those acquiring 30% must offer to purchase all remaining shares at a higher price ever offered over the previous 12 months. Additionally, a shareholder with 25% stake can block particular forms of new equity issues and mergers (Franks and Mayer, 2002; Crespi and Renneboog, 2003).

Moreover, the stock market in the UK is very liquid and it might tempt an individual investor to express own reservations about management by exiting (*short-termism*) - selling up to invest elsewhere. However, Chakravarty and Hodgkinson (2001, 2004) argue that resorting to the sale of a small block of shares in a liquid market is unlikely to depress the price of stocks. Based on this, large shareholders might, arguably, know that the fall in share prices with the rise in the supply of stocks to the secondary markets might affect their wealth. This might creative the incentives in the shareholders to exert control pressure instead of exit strategy by resorting to shareholder activism and collective actions in order to dominate or contest in firm control. Hence, related to block ownership, an important issue is whether ownership concentration or dispersion and large blockholders in the UK listed firms (if they are active) can enhance firm performance or not.

The other important issue related to control of corporations is the role of internal corporate governance mechanisms, the board of directors. Franks and Mayer (2002) report that the directors play weak role in corporate governance and the non-executive directors do not perform a disciplinary function, even though separation of Chairman and CEO position plays the function. Moreover, considering the legal rules and regulations, Franks and Mayer (2002) argue that the powers to enforce directors' fiduciary responsibilities are weak in the UK. This is based on Stapledon (1996) argument that actions to enforce the duties in listed firms had been almost non-existent then even though the directors owe their firms fiduciary responsibilities. This is debatable since the absence or rareness of taking directors to court might not necessarily indicate the existence of weak enforcement of directors' fiduciary duties and since there is high investor protection in the UK. They also suggest that directors of UK companies perform more of an advisory role than a monitoring role (Franks and Mayer, 2002, p.19). It is thus essential to find out empirically whether this is the case or whether the UK board of directors' impact control dominance and firm performance or not.

Regarding blockholder, Franks and Mayer (2002) find strong evidence of managerial entrenchment that leads to poor performance, and they conclude that large blockholders do not seem to discipline poorly performing UK listed companies, except in industrial firms. They report that the single most important of large blocks are directors who might use their stakes to resist outside intervention. Moreover, literature show that institutional investors are the dominant shareholders in the UK listed firms. However, empirical results show no strong evidence that link institutional investors' activism (disciplining or monitoring role) to firm performance for the UK firms (Black and Coffee, 1994; Faccio and Lasfer, 2000; McKnight and Weir, 2009).

One possible explanation regarding the nature of UK large shareholders activism might be related to the national level of governance system. It is stated that the UK national level of corporate governance system is *outsider system*, where most large firms are directly controlled by their managers, but indirectly controlled through actions of outsider blockholders, especially by institutional investors (Franks and Mayer, 1994; Short et al., 1998). It is not as in the *insider system* of corporate governance, like in Germany, where most companies are controlled by one or more major blockholder categories such as families, other firms and banks. It is suggested that institutional blockholders, that characterize the UK outsider system, might have substantial influence over the company directors (Solomon and Solomon, 1999). Hence, the form of direct or indirect control of outside blockholders in the UK, which is not empirically established, is an important research issue.

Due to the financial crises and corporate failures of the beginning of 1990s and 2000s, series of UK corporate governance reforms have been encouraging in increase the activism of shareholders in general and institutional investors in particular. The Cadbury (1992), Greenbury (1995) and Hampel (1998) corporate governance commissions (Crespi and Renneboog, 2002) published reports that included recommendations on shareholder activism among other things.

One form of activism encouraged in the governance reforms is the use of voting rights. The Cadbury Report (1992) provides that institutional investors should use their voting rights in order to carry on their responsibility to be active on behalf of their clients and to use vote in order to effect change instead of resorting to short-termism and recommends that they should disclose their voting policies. The Hampel Report (1998) also encouraged the increase activism by using voting rights. In line with this, the largest group of UK institutional investors, the National Association of Pension Funds (NAPF) also encourages that all institutional investors should devise voting policies and to cast their votes regularly at the annual General Meetings of their investee companies (NAPF, 1995). Surveying institutional voting behaviour of investment funds Mallin (1996, 1997, 1999) show the fast growth in vote castings by intuitional investors, though many are not voting at all. Likewise, the Hampel Report (1998) assured reforming impact of the Cadbury Committee recommendations by stating that several institutional investors announced their voting policy on all resolutions at investee company meetings. However, it disclosed that there had not been significant increase since the proportion of shares voted remained under 40%. The Pension & Investment Research Consultants Ltd (PIRC, 1999) survey on institutional investors voting trends show that overall proxy voting levels have increased to 50%. Hence, given that proportion of votes casted by blockholders is reported to be low, the interesting question that remains is: *how do institutional investors exert their influences on the directors? What other form is the UK shareholder activism practically taking?*

Moreover, researching the roles and responsibilities of trustees, the Myners (2001) makes alarming reports, among other things, that 62% of them had no professional qualifications in finance or investment; 77% of them had no in-house investment professionals to assist them; and 49% of them spent 3 hours or less preparing for pension investment matters. In its conclusions, the Myners Review (2001) suggests that (1) trustees are in a responsible position and have the ultimate decision-making power for the strategy of institutional investors, and (2) trustees are required to be prepared more to take on their important role. Furthermore, the Myners Reviews of 2004 and 2007 show progress in trustees improving knowledge and understanding, strategic investment decisions, transparency and reporting, and activism and engagement etc. and recommending more shareholder activism and the adoption of the Institutional Shareholders Committee (ISC) Principles (2007) that provides voluntary disclosure of votes to encourage activism (Financial Reporting Council, FRC, 2010).

The more recent corporate governance initiatives the UK relevant to this research, the Combined Code (2006), in contrast to the previous Code allows that the Chairman to serve on remuneration committee if considered independent on appointment, and recommends that the Chairman should not chair the committee. It also provides an additional option, 'vote withheld' to proxy voting by shareholders in addition to the options of 'for' and 'against' resolution. This enables shareholders to indicate if they have reservations on a resolution, even though 'vote withheld' is not a vote and is not counted to determine the proportion of votes for or against the resolution. Finally, the Code provides that the details of the proxy vote including 'votes withheld' and the terms of reference of the three board subcommittees should be made available to shareholders on company website.

Moreover, two recent Reports have been published initiated by the recent financial crisis – the Turner Report (2009) and the Walker Report (2009). The Turner Report (2009) makes recommendations on exerting more regulation on banks and other financial institutions, and on remuneration policies. It provides that remuneration policies should be designed to avoid incentives for undue risk-taking and that risk management considerations should be closely integrated into remuneration decision to be developed and enforced by UK and global codes. Lately, the Walker Report (2009) makes recommendations that strengthen the position of the chairman as the leader of the board, and that non-executive directors (NEDs) should have required business experience and commit more time to the business entity.

The other form of activism encouraged by the UK governance reforms is communication of strategies to and entering dialogue (engagement) with investee companies. From the concerns about short-termism, the Cadbury Report (1992) suggest that companies should communicate their strategies to their major shareholders and that their shareholders should understand them if long-term relationship is to be developed. More explicitly, the Hampel Report (1998) formalized the link between decision and communication by stating that institutional investors should enter into dialogue with firms. It is reported that institutional investors have traditionally been communicating with their investee companies mainly for trade information rather than for monitoring their firms.

Regarding entering dialogue, literature shows that the UK blockholders' activism has developed from monitoring for trade information to *engagement*. Solomon and Solomon (1999, p.290) suggest that there is a further indication of activism, which shows that institutional investors form coalitions if companies are seen to be in a crisis, thereby seeking to solve problems rather than selling their shares. Holland (1998) and Jackson (2001) suggest also that some UK investors used meetings with senior executives for dialogue, and that the dialogue were primarily used as a basis for their buying and selling decisions. Moreover, later reports suggest that the UK mainstream institutions have transformed themselves from the traditional non-interventionist policy and monitoring only for trade formation to activism to control (Hendry et al, 2004). Hendry et al. (2004) write that the UK institutions have significantly increased both the resources they devote to corporate governance related activities (having senior managers responsible for corporate governance, and dedicating teams of experts on corporate governance) and their active engagements with companies. The evidenced engagement approach is the rapid growth in opposing against company resolutions through voting (PIRC 2002, 2003) and publicly through the press. For instance, the growing tensions between the increasingly vocal institutions and the boards of firms in which they invest related to the series of highly publicized interventions in the UK led to the reported meetings between representatives of the two sides called by the companies in an attempt to make peace (Lewis, 2004). Buchanan et al., (2009) find that the success rate of the UK shareholder activism through proxy practices between 2000 and 2006 is higher than that of the US.

Another form of activism witnessed in the UK is related to the use of the right to call Extraordinary General Meeting (EGM) with a 10% or more voting power, as provided in UK law. One good example is the Hermes U.K. Focus Fund use of strategy to increase its shares in the company it has already stakes and the use of the threat of calling EGM to internalize the benefits of activism. The internalized benefits of activism are manifested in the improvement of firm performance or shareholder values. As evidence to this fact, Becht et al. (2008) report the success of Hermes fund's activism (activities of using letters, memos, other communications via telephones) in generating returns to its investors (measured in annual raw returns net of fees of 8.2% and abnormal returns net of fees of 4.9%) against the FTSE All Share Index during 1998-2004.

The last form of activism in the UK we consider is collective actions. UK institutions are well organized and they frequently make engagements of *collective actions* through the formation of coalitions or associations like, the Association of British Insurers and the National Association of Pension Funds (Becht et al., 2008). Such associations and their collective actions of UK institutional investors might be a power tool of shareholder monitoring or control. Moreover, we suggest that there might be blockholders' coalition that might be formed for temporary or permanent collective action. The UK regulatory authorities consider coalitions of shareholders formed for a longer period of time an investor group that is liable to all disclosure requirements, reporting and governance regulations that apply to large blockholders (15% stake to disclose strategic intent, 30% stake to comply to mandatory takeover rule) (Goergen and Renneboog, 2001; Stapledon, 1996). Hence, the existence of long-term blockholders coalition agreements are rarely made public and are only forged on ad hoc basis for specific purposes like removing management, takeover contest, etc. Hence, coalitions are commonly kept confidential. However, there can be explicit voting contracts that are drawn up (Van Hulle, 1998). The confidential nature of voting contracts makes it difficult to directly evidence blockholder coalitions in the UK (Crespi and Renneboog, 2003). Since it might be possible to forge coalitions for institutions via meeting at national association forums and other categories of

blockholders can also forge voting coalitions based on their similarities and common private benefits of control, we argue that it is valid to think about control coalitions in the UK.

Moreover, it is arguable that the UK corporate system is favourable and conducive for shareholder activism because of shareholder protection provided in the mandatory rules and regulations. Firstly, the UK Company Law provides that it is mandatory that shareholders can change the articles and memorandum, whereas the US state law states that it is mandatory that the shareholders cannot initiate a change in the company Charter (Bebchuk, 2005). Hence, shareholders in the UK can change the company regulation without the approval or agreement of the board, whereas the approval of the board is mandatory if shareholders initiate the amendment of the original Charter in some US states.

Secondly, investor protection in the UK can be noted from the regulatory framework that requires cumulative majority voting for each director, where 'yes' vote count for every director must be a majority excluding abstentions. Any director that stands for election or re-election can be removed from the board by the vote rule without alternative director being proposed or appointed in the UK. In contrast, in some US states, where state law applies, for instance, Delware, majority of votes cast is not needed for a director to be elected, nor is it possible to cast votes against candidates. This indicates that the legislation in the US is more in favour of the incumbent management (Bebchuk, 2007).

Finally, another indicator of the shareholder protection in the UK law is that shareholders can call Extraordinary General Meeting with a 10% or more voting power, and make proposals to remove any or all of the directors and casting simple majority vote. Hence, staggered boards cannot constrain the power of shareholders to dismiss directors in the UK. In contrast, shareholders cannot call such a meeting unless it is provided in the corporate charters in Delware, the US, where the removal of the directors, particularly of staggered boards is difficult.

To sum up, it is shown from the background issues related to the UK corporate system that there have been conducive situations and factors for blockholders activism provided by corporate governance reforms, associations of shareholders and the communication and engagements between blockholders and investee companies provided by the *outsider system* of governance system in the UK that traditionally create relationship atmosphere between investors and companies. Even though there are several forms of activism of shareholders in the UK, it is difficult to know which one effectively is being undertaken to control or monitor firms. The most viable and effective form to assume control is coalition of blockholders, which is still confidential and difficult to detect and measure. Despite this, the research will make its own assumptions of the presence of coalitions of blockholders and collective actions for dominating and contesting control in order to investigate which blockholder structures, including coalitions, are determinants of firm performance and board structure. The following section will make review of the literature in order to show the theoretical and methodological issues of blockholders and firm control in priori studies related to the theme.

5.2.2 Reviews on Blockholders and Firm Control

On the prevalence of blockholders owning significant blocks of share stakes in listed corporations Demsetz and Lehn (1985) document that the combined stakes of the top five and top twenty shareholders averaged 25% and nearly 40% respectively for a sample of 511 large US firms in 1980. Additionally, the comprehensive study by La Porta et al. (1999) established that ownership is highly concentrated around the world, confirming the prevalence of large blockholders.

Regarding Western Europe, Becht and Mayer (2001) find high level of ownership concentration for most of the European countries. According to the European Corporate Governance Network (ECGN), in eight out of the nine largest stock markets of the European Union, including the UK, the median size of the second largest voting bloc in large listed firms exceeds 5%. The only exception according to ECGN in the list are Austria and Germany, whose second largest voting blocs are less than 5% (2.5% and 0 respectively) (Becht and Mayer, 2001). In Germany, between 25 and 40% of the listed firms were found to have 2 or more large blockholders (Becht and Boehmer, 2001; Lehmann and Weigand, 2000). Becht and Mayer (2001) reported that the third median voting blocs of UK non-financial listed companies is 5.2%, where they are less than 5% for the Continent. Beyond the tenth largest blockholding, they find that the mean voting bloc is greater than 3%. These facts indicate that the UK has higher ownership dispersion than on the Continent and the prevalence of more number of blockholders in the UK. More recently, Holderness (2007) finds that the US ownership concentration is similar to that of elsewhere.

Despite the evidence on the prevalence of large blockholders that are common around the world and even in the relatively widely dispersed ownership structure countries of the UK and the US, there is still a lack of strong theoretical framework on the controlling and monitoring role of large blockholders, whose voting power is very important in determining corporate control. Hence, the theoretical framework regarding the second-order agency problem and the role of large blockholders in corporate control might be of significant practical importance for researchers as well as policy makers. Hence, this research devotes a part to the theoretical framework, which is still scant.

According to the neoclassical theory of the firm, the dispersed share ownership means that the risk is shared efficiently across a multitude of individual shareholders that have control rights to the firm in proportion of their share stake in a one-share-one-vote rule. This is depicted in the private property rights theory and the resource-based perspectives. The resource-based approach, which studies power in terms of the basic resources from which it derives, suggests that ownership control of listed firms is related to the shares stakes of different shareholders and the voting rules provided in the Articles of Association of the firms (Leech, 2004). However, considering the wide dispersion of corporate share ownership, the separation of ownership from control hypothesis and the principal-agent theory established the view that the source of conflict in modern corporations is between shareholders and managers (Berle and Means, 1932; Jensen and Meckling, 1976; Fama and Jensen, 1983). Even though the fact about the principal-agent relationship and conflict cannot be denied, theoretical framework on significant blockholders having significant voting powers that determines the corporate control factors in the firm is also required to explain or model a complete picture of corporate control. Hence, since the existing empirical evidence on the share ownership pattern shows that the reality of the modern public corporation is much different from the neoclassical

theoretical setting, the second-order agency theory on the conflict of interest between large blockholders and minority shareholders needs more attention.

Jensen and Meckling (1976) lay the theoretical base of several blockholders, when they formulated the principal-agent relationship, describing the problems that arise between the owner-manager and minority blockholders as the owner-manager or entrepreneur sells part of the stakes. They suggest that as entrepreneur's proportion of equity stakes fall, the owner-manager tends to appropriate larger amounts of the corporate resources in the form of perquisites, which induces minority shareholders to expend more resources in monitoring the owner-manager. Jensen and Meckling (1976, p9-10) devise a simple formal analysis of agency problems by making, among others, the following permanent simplifying assumptions: (1) all outside equity shares are non-voting, (2) no outside owner gains utility from ownership in a firm in any way other than through its effect on his wealth or cash flows, and (3) there exists a single manager (the peak coordinator) with ownership interest in the firm.

However, it can be argued that the reality of modern listed corporations with widely dispersed share ownership is different, and the three assumptions are not valid for the situation where several blockholders with voting power attached to their cash flow rights exist. Firstly, in the UK where there is predominantly one-share-one-vote, almost all outside equity have voting rights. Secondly, the voting rights and power gives the significant blockholders the incentive and ability to control or monitor the firm and to gain utility from the ownership. Finally, there are multiple managers with ownership interest in the firm. The analysis of the principal-agent relationship by Jensen and Meckling (1976) and the analysis of the separation of ownership and control relevant to agency problem by Fama and Jensen (1983) perfectly works with the absolutely concentrated share ownership where the owner manager holds almost all or absolute majority of the equity of the firm and where the managers are professionals owning none or insignificant proportion of the company outstanding equity. Some of the simplifying assumptions of the model leave out the role of other significant blockholders, which might also have the ability and incentives to exert their control pressure directly or indirectly even without being elected or represented in the board of directors, does not explicitly remarkably explain the second-order agency conflict.

In fact, the second-order (second-type) agency conflict, which was first suggested by Demsetz and Lehn (1985), is specifically about the conflict of interest between the controlling large blockholders and widely dispersed minority shareholders. The source of conflict and the agency costs inherent in the relationship between large blockholders and minority shareholders (the disagreement between shareholders themselves) has been explored in literature lately. It is obvious that different shareholders or blockholders have different interests. For instance, DeMarzo (1993) argues that shareholders may not agree on some investment policies, even though they individually agree on the objective to maximize profit, and this can be a source of conflict of interest between large controlling blockholders and minority shareholders.

Furthermore, DeMarzo (1993) argues that the possibility of disagreement between large controlling blockholders and minority shareholders is anticipated since it is embedded in the incorporating Charter of a corporation, whereby some mechanism of majority voting is installed to resolve potential disputes. The common mechanism to resolve the disputes include proxy battles and other control schemes in the company regulations (DeMarzo, 1993). Additionally, Maug (1998) argues that some investors, most likely large blockholders, can intervene in a company via hostile takeover.

It is obvious that the size of the voting power of large blockholders is important in determining the corporate control structure. Large blockholders with more than 50% voting power might dominate the control of the firm unilaterally (Leech, 1988), even though it might still be possible that the remaining blockholders might exert monitoring control by bearing monitoring costs as contestants. In the reality of dispersed ownership like the UK listed firms, however, attaining a single-handed majority voting right is very rare. The requirement of the UK Takeover Code, which provides that owners with at least 30% of shares should make a takeover offer of the remaining equity, might possibly support this fact. Regarding the situation where ownership is dispersed and multiple blockholders are prevalent, it is suggested that there is a competition among blockholders for votes of other shareholders in order to attain a majority vote or any required level of provisions for actions and to influence or attain control over the strategy and decision-making of the companies; and this might result in controls by coalitions (Bennedsen and Wolfenzon, 2000; Bloch and Hege, 2001). Hence, it might be suggestive to think of the potential for the undertakings of control coalitions and collective actions by multiple blockholders when ownership is dispersed. Our modelling that also assumes coalitions of blockholders stems from this perspective, and the different versions of the model will be discussed in details in hypothesis development section. However, we present brief introductory review of some models that show how different multiple blockholders compete for corporate control as follows.

The first model worth of mentioning assumes that the first largest blockholder is the ultimate controller of the firm. It provides a framework on the possible way in which multiple blockholders monitor the controlling shareholder (Winton, 1993; Pagano and Roell, 1998; Bolton and Von Thaden, 1998). For the purpose of this research, it is also assumed that the second largest blockholder might be considered to be the most capable contestant to the control dominance exerted by the largest blockholder, especially when there is little difference in their ownership stake. It might be argued that the second largest blockholder might be motivated by the shared benefits of control and the incentives of cash flow, and hence, exert control pressure bearing the monitoring costs. Even though this research delimited to account for it, there might also be the possibility of contesting the control power of the largest blockholder by a group of large blockholders. Regarding this, Pagano and Roell (1998) suggest that all or some blockholders form a group to monitor a controlling manager that is a large blockholder. This assumes that all might bear the monitoring costs, in contrast to the argument of free-riding hypothesis, which states that multiple blockholders might not be willing to bear the monitoring costs and this discourages monitoring of the controllers or management.

Another model considered assumes contestability within a coalition as suggested by Bloch and Hedge (2001), which presents a coalition of two large blockholders having difference in the capacity to define strategy and to monitor the manager, and competing for winning the votes of minority blockholders in order gain control. In the simple model, the winning blockholder defines firm's strategy, and both parties playing a monitoring role and bear the costs. They suggest that the competition for others' vote induces them to reduce their private benefits and this might enhance firm value. However, since the assumption of contestability within the coalition in the model is important for the purpose of this study, it is suggestive to assume that other blockholders outside the coalition of the two first largest blockholders might also exert a contesting pressure on the dominant coalition, and this might also enhance firm performance. Our theoretical and empirical model, which entails a more detailed discussion on this the model, incorporates this element.

The third model worth to mention assumes that all of the blockholders form controlling coalition. There are theoretical works that suggest how multiple blockholders form controlling coalitions to share private benefits of control (Leech, 1988; Zwiebel, 1995; Pagano and Roell, 1998; Bennedsen and Wolfenszon, 2000; Gomes and Novaes, 2001). Especially Bennedsen and Wolfenzon (2000) and Gomes and Novaes (2001) suggest a model in which a controlling coalition of a group of all blockholders is formed in order to control the firm. Gomes and Novaes (2001) argue that all large shareholders form a control group whose effect depends on the viability of the shared benefits of control, resulting in the *bargaining effect* or the *disagreement effect*, when deciding on the positive NPV projects. Additionally, Bennedsen and Wolfenzon (2000) suggest that in a control setting in which several blockholders compete for control, a coalition of blockholders is needed in order to gain control, where the consent of the members of the group is required to decide on the diversion of funds or appropriation of minority shareholders. They argue that such coalition formation has the *coalition formation effect* and the *alignment of interest effect*.

In the coalition model of all blockholders, the power of all blockholders can be measured by their voting power concentration, which can be a proxy for ownership concentration; hence, the model can be tested empirically. However, it excludes the contestability of control within the coalition that might also have the *wrecking effect* on the coalition, and hence, questions the stability and durability of such a coalition. It also excludes the possibility of the formation of a separate contesting coalition by blockholders motivated by common interest and the private as well as shared benefits of control. The other questionable issue we might raise is the viability of coalitions formed by all blockholders in the legal environment like in the UK that provides higher investor protection. It is arguable that the requirement to disclose strategic intent of voting pact or group (at 15% stake), the takeover mandatory rule (at 30% stake), and the clandestine nature of such coalitions (Crespi and Renneboog, 2003) make it difficult to consider a model of coalition of all blockholders in the UK. Hence, our model in this research is limited to dominant coalitions of two blockholders, two contestant blockholders or multiple contestant blockholders, in the framework we refer to in this study as *control dominance-contestability model,* which will be discussed in details in the hypotheses development section.

Finally, the few recent literature like La Porta et al. (2002) and Maury and Pajuste (2005) and Gutierrez and Pombo (2009) provide models of control contestability in multiple blockholders structure and their impact to the firm performance. The baseline model of La Porta et al. (2002) presents the impact of investor protection and the decrease or rise in the proportion of share

ownership of the sole controlling owner-manager on firm value. However, this simplifying assumption might not be enough to embrace the reality of interaction between multiple blockholders in listed firms. Maury and Pajuste (2005) and Gutierrez and Pombo (2009) extended the baseline model in order to account for contestability of control. According to their model, contestability of control among multiple blockholders might enhance firm value and that the rent extraction by the controlling coalition has the opposite effect. In contrast to their model, this research extends their contestability of control model to the simultaneous application of dominance and contestability of control model.

Empirically, the existing literature shows that the evidence on the effects of large blockholders on firm performance is mixed. Even in countries where there is high ownership concentration, Continental Europe, the monitoring role of blockholders is not supported by empirical evidence. Banerjee et al. (1997) for France, Renneboog (2000) for Belgium and Bianco and Casavola (1999) for Italy show evidence that blockholders do not actively play a monitoring role, as reflected in disciplining managers and enhancing the performance of their firms. In contrast, for German and Spanish listed firms, there is limited evidence on the positive monitoring impact of blockholders on performance (Kaplan, 1994; Crespi and Garcia, 1999).

On the other hand, Thomsen et al. (2006) find the negative association between aggregate blockholder ownership and firm performance and value for Continental Europe. However, studies that differentiate between blockholder categories find that blockholders are associated with firm performance. For a sample of German firms, 37.5% of which are family businesses, Andres (2008) find that family businesses outperform firms with other types of blockholders as well as widely held firms, using multivariate analysis, and that family block ownership show positive significant association with firm performance using panel regression analysis. Additionally, Hartzell et al. (2003), Barber (2006) and Chen et al. (2007) find that the presence of institutional blockholders enhances firm performance.

In Anglo-Saxon countries, where share distribution is widely dispersed and institutional investors are the predominant blockholders, and especially where there is an outsider system of control, where outsiders indirectly control the firm, it might be expected that the institutional investors play a great monitoring role and in corporate control (Black 1998; Gilson and Kraakman, 1991). For, for US firms, Holderness and Sheehan (1988), Barclay and Holderness (1989, 1991) and Bethel et al. (1998) show evidence of substantial management disciplining (reflected in management turnover), which is associated with majority blocks trade. Interestingly, Holderness and Sheehan (1988), Mikkelson and Ruback (1985), and Choi (1991) provide evidence of the similar impact of the acquisition of more than 5% ownership block. As previously mentioned, there is weak evidence of the role of large blockholders in disciplining poorly performing UK firms generally (Franks et al., 2001; Faccio and Lasfer, 2000), and that blockholder participation in control reflected in voting and corporate governance has been reported to be low, even though there is reportedly a trend of the rise in vote casting by institutional investors (Mallin, 1999).

Most studies that provide empirical evidence above focus on the impact of largest blockholders or individual blockholder categories or aggregates of blockholders. The trend of argument in very few studies is diverging from this to the contestability of control. For instance, Lehman and Weigand (2000) report that the presence of second largest blockholder enhances profitability of German

listed firms. Additionally, Volpin (2002) show evidence of higher firm value when control is contested (when voting syndicates control the firm). Studying the effect of multiple blockholders on dividends, Faccio et al. (2001) find that the presence of multiple large blockholders lowers expropriation in Europe. Nevertheless, these studies simply focus on the impact of the presence of multiple blockholders on firm performance, not the characteristic of individual blockholders and the forms of the possible blockholders' control structures, namely voting blocs, dominant coalitions and contesting coalitions that this research account for.

Moreover, there are recent studies that addressed the coalition and contestability of control hypothesis. Accounting for contestability, Laeven and Levine (2008) find for Western European widely held firms that those with the second blockholder have the highest value measured in Tobin's Q than firms with only one large blockholder. Additionally, Volpin (2002) report on Italian listed firms that firm's market value is higher when blockholders form coalitions or syndicates than when there is a single blockholder. Furthermore, Gutierrez and Tribo (2004) show that the number of blockholders is positively associated with better performance of private firms in Spain. For Swedish listed firms, Maury and Pajuste (2005) show evidence of contestability, reporting that when there are two blockholders of similar interest, the existence of a third blockholder enhances firm value.

Hence, in its attempt to investigate contestability, this research has identified two key papers - Maury and Pajuste (2005) and Gutierrez and Pombo (2009). On Finnish listed firms, Maury and Pajuste (2005) report that *Herfindahl Index concentration difference*, *Herfindahl index concentration*, Shapley values, and vote-to-cash flow right ratio have negative association with firm value measured in Tobin's Q. Gutierrez and Pombo (2009) provide evidence on Colombian listed firms that the contestability variables *Herfindahl Index concentration difference* and Shapley values show strong and significant negative association with firm performance (this is for Tobin's Q, ROA, market-to-sales ratio, and ROE), consistent with the finding of Maury and Pajuste (2005). However, they find that the aggregate voting power of the four blockholders and *Herfindahl Index concentration* have negative effect on market-to-sales ratio and ROE only in their sensitivity analysis. However, the two studies did not find any significant impact of stakes of ultimate or largest blockholder, and third largest blockholder, aggregate voting power of the four blockholders, or the presence of multiple blockholders on firm performance. However, the finding of Maury and Pajuste (2005) on Finnish listed firms that the positive effect of the voting power (attached to the ownership stake) of the second largest blockholder on firm value confirms the contestability of the control dominated by the first largest blockholder, thus supporting Lehman and Weigand (2000) evidence for German listed firms.

To sum up, this research would not attempt to formulate a new theory to fill the gap. From the review of the theoretical models made above, it extends the contestability of control hypothesis to the simultaneous consideration of *control dominance-contestability*, on which it develops the theoretical and empirical models so as to formulate different testable hypotheses. Hence, the following section presents the theoretical framework for *control dominance-contestability model* as a prelude to hypotheses formulation.

5.3 THEORETICAL FRAMEWORKS

5.3.1 La Porta et al. (2002) Baseline Model

La Porta et al. (2002) present the baseline model of control dominance and monitoring by the controlling largest blockholder in the perspective of minority shareholder protection. Their assumptions are: (1) there is one controlling shareholder in the firm, (2) the cash flow right of the controlling shareholder in the firm is equal, (3) the entrepreneur is a manager, and (4) the proportion of share ownership, ***α***, is exogenously determined by the history and the life cycle of the firm, not the sale of equity by the entrepreneur. They consider investment in a new project, ***I,*** which has a gross return rate, ***R***. Hence, in the fair and zero agency cost world:

The total profit (*Π)* for the firm:

$$\Pi = IR$$

The benefits of the owner-manager or controlling shareholder **(U_c)** will be:

$$U_c = \alpha\,(IR)$$

The benefits for the minority shareholders **(U_m)** will be:

$$U_m = IR - \alpha\,(IR) = (1-\alpha)\,IR$$

Hence total benefit (***$U_T = \Pi$***):

$$U_T = U_c + U_m = \alpha\,(IR) + (1-\alpha)\,IR = IR \quad (1)$$

However, the owner-manager has the tendency to extract a share of the realized profits (*Π)*, *s*, as tunnelling (misuse of firm assets via consumption of perquisite and shirking and other form of rent extraction) in order to maximize own utility. This implies only what remains of the profits after tunnelling goes to the minority blockholders in the form of dividends. However, tunnelling might take the form of salary, transfer pricing transactions, subsidized personal loans, discounted (non arms-length) asset transactions, excessive compensations, and in some cases, outright theft (La Porta et al., 2002). La Porta et al. (2002) bring in the cost incurred by the controlling blockholder, which is associated to the legal expropriation, whereby the controlling blockholder, ***C1,*** also bears costs. Hence, ***C1*** enjoys benefits that comes from the cash flow rights in the firm ***(U_s)*** and the benefits after incurring costs of expropriation of minority shareholders ***(U_c)***. Hence:

$U_s = \alpha\,(1-s)\,IR,$ and

$U_c = sIR - C\,(k,s)IR$ where ***C(k, s)*** is the share of profits that ***C1*** wastes when *s* is diverted;

Where ***C*** is the cost of expropriation function;

Where ***k*** is the quality of shareholder protection; and as ***k*** increases ***C*** to divert profit ***(Π)*** increases.

La Porta et al. (2002) assume that **k>0, s>0**, marginal costs of expropriation **(C_{ss})>0**, and **C_{ks} >0**. Hence, after expropriation, the benefit-cost function (utility), hereafter referred to as *U* (=U_s + U_c) that the entrepreneur maximizes is given by:

Total utility	=	C1's share of cash flow (U_s) + C1's profits after costs (U_c)
U	=	$\alpha (1-s) IR + s IR - C(k,s)IR$ (2)

The optimal solution of the equation **(2)** is independent of ***IR,*** which is common to all coefficients and hence the scale of the firm (La Porta et al, 2002). Hence, ***C1*** maximizes the utility function:

$$U = \alpha (1-s) + s - C(k,s) \quad (3)$$

The first order condition of ***U*** in equation (3) is given by:

$$\partial U/\partial s = 0 \rightarrow -\alpha + 1 - C_s(k,s) = 0$$

$$\rightarrow \boxed{Cs(k,s) = 1-\alpha} \quad (4)$$

Proposition 1: From equation **(4)**, it is implied that the consumption of perquisites by ***C1*** depends on the level of ***α***, the cash flow right of ***C1***. As proposed by La Porta et al. (2002) and consistent with suggestion of Jensen and Meckling (1976) that says high cash flow ownership reduces minority expropriation:

> *The higher **α,** the greater will is the incentive of **C1** to distribute the profit without expropriation of minority shareholders. Hence, in the equilibrium, there is the lower level of expropriation for a given investor protection level, **k**.*

The model is so basic given its assumptions. It is a baseline model for later development of control contestability model developed by Maury and Pajuste (2005) and Gutierrez and Pombo (2009). The divergence is marked by omitting the use of ***k,*** which is the quality of shareholder protection. The following section will discuss the contestability model.

5.3.2 Control Contestability Model

Marury and Pajuste (2005) extended the baseline model of dominance of the owner-manager of La Porta et al. (2002), which accounts for the level of investor protection, to a model that reveals contestability behaviour among large blockholders. The main assumptions they made are: (1) the largest shareholder is the manager, which is always in the controlling coalition; (2) the largest blockholder has the power to influence managerial decision-making even in the presence of professional managers and in possession of tools to extract private benefits at the expense of minority shareholders; and (3) other issues related to contestability.

The control contestability model of Maury and Pajuste (2005) diverge from the baseline model by substituting the contestability factor, represented by a heavy dot **(.)**, in place of minority shareholder protection (***k***). We use ¢ as a contestability factor instead of their heavy dot (**.**) in this study. Assuming that the diversion of profit is inefficient, they suggest the following relation:

The total profit (*Π)*:

$$\Pi = IR$$

The portion of the profit that contesting coalition (Π_c) receives:

$$\Pi_c = sIR - C(s, ¢)\, IR$$

I is investment; ***R*** is gross rate of return on investment; ***s*** is share of profit extracted, and ***¢*** is *contestability factor*; and ***C(s, ¢)*** is the cost of profit diversion (the share of profit wasted when s is diverted); and C is the cost of expropriation function.

Assuming that the cost of profit extraction ($\boldsymbol{C_s}$) and the marginal cost profit diversion ($\boldsymbol{C_{ss}}$) are positive, and **C(s, *¢)*** is an increasing function of ***s*** and since ***sIR*** is lost or diverted due to rent extraction; the firm value is given by:

$$\Pi = (1\text{-}s)\, IR$$

Considering the assumptions made above, the benefits to the controlling coalition depends on the aggregate cash flow rights that gives voting power ($\boldsymbol{\alpha_n}$) and the level of contestability posed by the contenders for control ***(¢)***, as clearly put by Gutierrez and Pombo (2009). The utility function of the dominant blockholder or coalition of blockholders comprise of two elements, namely the total cash flow benefit after expropriation and the benefits from expropriation.

The dominant coalition's cash flow benefits after profit diversion ($\boldsymbol{U_{d1}}$) is given as:

$$U_{d1} = \alpha_n IR - \alpha_n(1\text{-}s)IR = \alpha_n IR[(1-(1\text{-}s))] \quad (5)$$

The benefits of expropriation of the dominant coalition ($\boldsymbol{U_{d2}}$) are given as *the difference of the diverted profit (**sIR)** and the cost of profit extraction (**C(s, ¢) IR)***:

$$U_{d2} = sIR - C(s, ¢)\, IR \quad (6)$$

The cost function ***C(s, ¢)*** depends on the contestability variable, ***¢,*** is defined by Gutierrez and Pombo (2009) as the probability to recover the diverted profits and that can be proxied by the voting power of the contesting blockholder or coalition of blockholders. As the voting power of contestants increase, the contestants have more incentives to bear monitoring costs in order to recover diverted costs. The value ***¢*** increases with the voting power of the blockholders outside the dominant coalition. Hence, the dominant blockholder or blockholders coalition's benefits including rent extraction ($\boldsymbol{U_D}$) are given as the sum of the benefit from the diverted cash flows of the firm's projects ($\boldsymbol{U_{d1}}$) and the benefits of the rent extraction ($\boldsymbol{U_{d2}}$).

$$U_D = [\alpha_n IR - \alpha_n(1\text{-}s)IR] + [s\,(IR) - C(s, ¢)\, IR] \quad (7)$$

Taking into account for the cost of expropriation (***C(s, ¢) IR)***, the utility function of the controlling coalition in equation **(7)** accounting for the level of contestants' monitoring effort ***(1-¢)*** can be rewritten as:

$$U_D = [\alpha_n IR - \alpha_n(1\text{-}¢)(1\text{-}s)\, IR] + [(1\text{-}¢)s\,(IR) - C(s, ¢)\, IR]$$

$$U_D = [\alpha_n (1-(1-¢)) s] IR + [(1-¢) s (IR) - C(s, ¢) IR] \quad (8)$$

The dominant force has the incentives to maximize own utility function. Since the optimal solution of the equation **(8)** is independent of ***IR***, which is common to all coefficients or the scale of the firm, equation **(8)** can be rewritten as:

$$U_D = [\alpha_n (1-(1-¢)) s] + [(1-¢) s - C(s, ¢)] \quad (9)$$

Hence, the first order condition of equation (**9**) is give as:

$$\partial U_D / \partial s = 0$$

$$\rightarrow -(1-¢)\,\alpha_n + (1-¢) - C_s(s, ¢) = 0$$

$$\rightarrow -(1-¢)\,\alpha_n + (1-¢) = C_s(s, ¢)$$

$$\rightarrow C_s(s, ¢) = -(1-¢)\,\alpha_n + (1-¢)$$

$$\rightarrow C_s(s, ¢) = (1-¢) - (1-¢)\alpha_n$$

$$\rightarrow C_s(s, ¢) = 1-¢-\alpha_n+¢\alpha_n$$

$$\boxed{C_s(s, ¢) = (1-¢)(1-\alpha_n) = 1-¢-\alpha_n+¢\alpha_n} \quad (10)$$

Proposition 2: It can be suggested from equation **(10)** that:

1. *The cost of diverting rents for private benefits by the controller(s) will fall with the rise in their cash flow rights, keeping others constant.*

2. *The higher the contestability factor (¢) by the contestant(s), the higher will be the costs of diverting rents, keeping others constant.*

3. *The final outcome in the equilibrium depends on the trade-off between the states of ¢ and α_n and the trade-off between the marginal costs and marginal benefits of rent diversion.*

4. *Hence, the higher the cost of diverting rents for private benefits by the controller(s) and the higher the contestability factor (¢) by the contestant(s) and their monitoring costs and hence their power, the less will be the diversion of rents and hence the lower appropriation of minority shareholders*, whereby *the controller(s) might decrease their costs of rent diversion finding it less worthy to bear higher costs of diverting rents. This might have the impact increasing firm performance.*

5. *Finally, it can be proposed from (1) - (4) that the higher will be the incentive of the controller(s) to distribute profits and the less will be the appropriation of minority shareholders as contestability increases. This might be the case since controller(s) are willing to bear the costs of rent diversion only to the extent that the marginal costs of rent diversion is less than or equal to the marginal benefits from diverted rents.*

Considering the dominant controller perspective, the dominant controller(s) will try to minimize the cost function give in equation **(10)**. The optimal ***s**** can be determined from the equation such that its value is between 0 and the maximum fraction of profits that can be diverted, ***ś***. The monitoring from the contestants is assumed to bar the controllers to divert the rent beyond the maximum ***ś*** (Maury and Pajuste, 2005). The monitoring by the contesting force will counter and reduce the optimal rent extraction by increasing ***¢.***

5.3.3 Control Dominance-Contestability Model

So far, the baseline and the contestability models explained above consider the utility of the dominant blockholder or coalition of blockholders. Following them, this research extends the model so that it also accounts for the utility function from the control contestability perspective, which can be referred to as *control dominance-contestability model*. This leads us to the use of structural modelling in order to investigate the control of listed firms.

5.3.3.1 Control Dominance Perspective

In this framework, considering that the optimal solution for equation **(7)** above is independent of the common coefficient ***IR,*** which can be taken as a constant scale of the firm (La Porta et al, 2002; Maury and Pajuste, 2005; Gutierrez and Pombo, 2009), and as one equation of our structural model referring to the dominant blockholder perspective (***U_D***), we arrive at equation (**11**).

$$U_D = [\alpha_n IR - \alpha_n(1-s)IR] + [s(IR) - C(s, ¢)IR] \quad (7)$$

$$\rightarrow = \alpha_n - \alpha_n(1-s) + s - C(s, ¢) \quad (11)$$

Hence, the first order condition of equation (**11**) is give as:

$$U_D = \alpha_n - \alpha_n(1-s) + s - C(s, ¢)$$

$$\partial U_D/\partial s = 0 \rightarrow 0 - \alpha_n + 1 - C_s(s, ¢) = 0$$

$$\rightarrow -\alpha_n + 1 = C_s(s, ¢)$$

$$\rightarrow C_s(s, ¢) = (1-\alpha_n)$$

$$\boxed{C_s(s, ¢) = 1-\alpha_n} \quad (12)$$

Proposition 3: Consisting with the existing theoretical explanations (Maury and Pajuste, 2005 and Gutierrez and Pombo, 2009), it can be suggested from equation **(12)** that:

- *The cost of diverting rents by the dominant controller(s) might decrease as the proportion of their cash flow rights increases.*

- *The costs of rents diversion in the presence of contestability factor (¢) might increase due to the required high secrecy in the presence of the contesting coalition (Bennedsen and Wolfenzon, 2002).*

- *Hence, the controller(s) will have higher incentives to distribute profits the less the appropriation of minority shareholders as their cash flow rights increase.*

Furthermore, the first-order condition of equation (11) with respect to ¢ can be given as:

$$U_D = \alpha_n - \alpha_n(1-s) + s - C(s, ¢)$$

$$\partial U_D/\partial ¢ = 0 \rightarrow o - s\alpha_n + s - C_¢(s, ¢) = 0$$

$$\rightarrow s - s\alpha_n = C_¢(s, ¢)$$

$$\rightarrow C_¢(s, ¢) = s(1-\alpha_n)$$

$$\boxed{C_¢(s, ¢) = s - s\alpha_n = s(1-\alpha_n)} \quad (13)$$

Proposition 4: It can be proposed from equation (**13**) that:

1. *As the share of the diverted rents (**s**) increases, the costs of contestability to recover the diverted rents will increase depending upon the voting power of the controller(s) or will decrease based upon the marginal benefits from the share of rent diverted.*

2. *As the cash flow rights of the dominant controller(s) decreases given that there is the rise in diverted rents (**s**), the costs of contestability to prevent rent diversion will increase.*

3. *The final outcome of contestability costs in the equilibrium depends on the trade-off between the states of **s** and $\boldsymbol{\alpha_n}$ and the trade-off between the marginal costs and marginal benefits from recovered rents.*

4. *From (1) - (3), it might be suggested that the contestant(s) are only willing to bear the costs of recovering diverted rents only to the extent that the marginal costs to prevent rents diversion is less than or equal to the marginal benefits from diverted rents (s).*

5.3.3.2 Control Contestability Perspective

The other equation in the structural framework arises from the control contestability perspective where the utility function of the contestant(s) ***(U_C)*** is taken into account. We assume that contesting blockholder(s) that have their own utility function might counteract the actions or behaviours of dominant blockholders(s) taking the Newton's scientific law that *'for every action there is an opposite and equal reaction.'* The utility function of the blockholder or coalition of blockholders that monitors the controller(s) depends on the voting power of the contestants ($\boldsymbol{\acute{\alpha}_n}$), and the pressure the contesting blockholder(s) pose in order to make it difficult for the controllers to extract rents ***(¢),*** namely**,** the ability to recover the rents that could have been diverted by the dominant force **.** Let us denote the utility function of the contesting force as $\boldsymbol{U_C}$. Hence, the net benefit of the contestant

comes from two sources, namely, the net benefit from cash flow rights (***U_{C1})*** and the benefits from monitoring ***(U_{C2})***. Hence:

The contestant(s) net benefit that comes from the cash flow right of the contestant is given by:

$$U_{C1} = \acute{\alpha}_n (IR) - \acute{\alpha}_n (1-¢)s\ IR \qquad (14)$$

The contestant(s) net benefit that comes from monitoring costs incurred to recover the rent that could have been lost due to expropriation **(U_{C2})** is given as *the difference of the benefit from monitoring effort to recover the diverted profit* ***((1-¢)s IR)*** *and the cost of profit extraction given the level of the share of diverted rent* ***(C(s,¢) IR)***:

$$U_{C2} = (1-¢)s\ IR - C(s, ¢)\ IR \qquad (15)$$

Hence, the total net benefit ($U_C = U_{C1} + U_{C2}$) and its optimal value after removing the scalar common to the right hand side will be given as:

$$U_C = [\acute{\alpha}_n (IR) - \acute{\alpha}_n (1-¢)s\ IR] + [(1-¢)s\ IR - C(s, ¢)\ IR] \qquad (16)$$

$$U_C = \acute{\alpha}_n - \acute{\alpha}_n (1-¢)s + (1-¢)s - C(s, ¢) \qquad (17)$$

The first order condition of the optimal value of utility of contestant(s), equation **(17),** with respect to ***s*** is give as:

$$U_C = \acute{\alpha}_n - \acute{\alpha}_n (1-¢)s + (1-¢)s - C(s, ¢)$$

$$\partial U_C/\partial s = 0$$

$$\rightarrow 0 - \acute{\alpha}_n(1-¢) + (1-¢) - C_s(s, ¢) = 0$$

$$\rightarrow -\acute{\alpha}_n(1-¢) + (1-¢) - C_s(s, ¢) = 0$$

$$\rightarrow -\acute{\alpha}_n(1-¢) + (1-¢) = C_s(s, ¢)$$

$$\rightarrow C_s(s, ¢) = -\acute{\alpha}_n (1-¢) + (1-¢)$$

$$\rightarrow C_s(s, ¢) = (1-¢)(1-\acute{\alpha}_n)$$

$$\boxed{C_s(s, ¢) = (1-¢)(1-\acute{\alpha}_n) = 1-¢-\acute{\alpha}_n+¢\acute{\alpha}_n} \qquad (18)$$

Proposition 5: From equation **(18)**, consistent with the theoretical explanations of Maury and Pajuste (2005) and Gutierrez and Pombo (2009) it can be suggested that given the ***s*** level of expropriation:

1. *The costs to divert rent by the dominant controller(s) will decrease as the monitoring costs of the contestant(s) increase, others kept constant.*

2. *The costs to divert rent by the controller(s) will decrease as the cash flow rights of the contestant(s) increase, others kept constant.*

3. *The final outcome in the equilibrium depends on the trade-off between the states of* ***¢*** *and* $\acute{\alpha}_n$ *and the trade-off between the marginal costs and marginal benefits of rent diversion.*

4. *Hence, the higher the voting power of the contestant(s) and the higher their monitoring costs and hence their control power, the less will be the diversion of rents and hence the appropriation of minority shareholders*, whereby *the controller(s) might decrease their costs of rent diversion finding it less worthy to bear higher costs of diverting rents. This might have the impact increasing firm performance.*

5. *Finally, it can be proposed from (1) - (4) that the higher will be the incentive of the controller(s) to distribute profits and the less will be the appropriation of minority shareholders as contestability increases. This might be the case since controller(s) are willing to bear the costs of rent diversion only to the extent that the marginal costs of rent diversion is less than or equal to the marginal benefits from diverted rents.*

Moreover, the first order condition of equation **(17)** with respect to **¢** can be given as the following:

$$U_C = \acute{\alpha}_n - \acute{\alpha}_n(1-¢)s + (1-¢)s - C(s, ¢)$$

$$\partial U_C/\partial ¢ = 0$$

$$\rightarrow 0 - -1(\acute{\alpha}_n s) + (-1)s - C_¢(s, ¢) = 0$$

$$\rightarrow \acute{\alpha}_n s - s - C_¢(s, ¢) = 0$$

$$\rightarrow \acute{\alpha}_n s - s = C_¢(s, ¢)$$

$$\boxed{C_¢(s, ¢) = s(\acute{\alpha}_n - 1) = s\acute{\alpha}_n - s} \qquad (19)$$

Proposition 6: Consistent with the theoretical explanations (Maury and Pajuste, 2005 and Gutierrez and Pombo, 2009), equation **(19)** suggests that the monitoring costs incurred by the contestant(s) are directly proportional to share of the rent that is diverted **(*s*)** and the cash flow rights of the contestant(s) **($\acute{\alpha}_n$)**. Hence:

1. *As the share of rents diverted (**s**) increases, the monitoring costs (**¢**) incurred by contestant(s) to recover the rents to be diverted will increase depending on* $\acute{\alpha}_n$ *or decrease depending on the benefits from share of rent diverted, others kept constant.*

2. *As the voting power of contestant(s) (*$\acute{\alpha}_n$*) increases, the monitoring costs or the contestability (**¢**) to recover the rent to be diverted will increases*, *others kept constant.*

3. *The final outcome of (**¢**) in the equilibrium depends on the trade-off between the states of* ***s*** *and* $\acute{\alpha}_n$ *and the trade-off between the marginal costs of monitoring and marginal benefits from recovered rents.*

4. *Hence, from (1) - (3) it might be suggestive that with the increase in their cash flow rights and the increase in the share of diverted rents, contestant(s) might have the incentives and ability to bear the monitoring costs to recover rents to be diverted only to the extent*

that the marginal costs of monitoring is less than or equal to the marginal benefits from the recovered rents.

Conclusion: Propositions **3-6** depict the *control dominance-contestability model* of blockholders' structure. They provide a theoretical framework for the way large blockholders interact and share control power based on the benefits and costs of both parties to dominate or to contest corporate control power. Even though, the insight of the impact of the costs of rent extraction and the monitoring costs of contestants on firm performance or value have been shown in the propositions, it would be necessary to lay down the theoretical framework of the implication of *control dominance-contestability model* to firm value in the following *subsection*.

5.3.4 Implication of the Model to Firm Valuation

We now consider the implication of the models discussed above to the valuation of the firm. As we mentioned previously, the firm's value depends on the available investment opportunities. Let ***V*** be the actual value of the firm. The value of the firm at any given time when there is no agency costs or diversion of rents is given by:

$$V = IR \qquad (20)$$

In the presence of agency problems, hence, agency costs of the diversion of rents by management, the value of the firm cannot be equal to one given in equation (**20**). Hence, when there is diversion of rents by the controlling blockholder(s), in the presence of monitoring by the contestant blockholder(s), the optimal or equilibrium rent that could be diverted or that can be agency costs is denoted ***s****. Hence, the firm value from the perspective of a minority outside shareholders that do not enjoy any benefits of control is given by:

$$V_{S*} = (1-s^*)\, IR \qquad (21)$$

However, when there is contestability of control posed by monitoring by non-controlling blockholders is taken into account, both the dominant(s) and the contestant(s) benefit from their interaction. Hence, the effective firm value is given by the summation of $\boldsymbol{U_D}$ and $\boldsymbol{U_C}$ given in equations **(11)** and **(17)**, substituting ***s*** by ***s**** and ¢ by ¢*.*

$$V = \Pi_D + \Pi_C = U_D + U_C$$

$$\begin{aligned} \rightarrow V_{S*} = {} & [\alpha_n IR - \alpha_n (1-s^*) IR] + [s^* (IR) - C(s^*, ¢^*) IR] + \\ & [\acute{\alpha}_n (IR) - \acute{\alpha}_n (1-¢^*) s^* IR] + [(1-¢^*) s^* IR - C(s^*, ¢^*) IR] \end{aligned} \qquad (22)$$

In the equilibrium, the optimal ***s**** is attained at the level where the trade-offs of the benefits and costs for dominant controller(s) and for the contestant(s) will be equal, namely, when:

$$[s^* (IR) - C(s^*, ¢^*) IR] = [(1-¢)\, s^* IR - C(s^*, ¢^*) IR]$$

In equation (**22**), these benefits and costs cancel each other assuming that for *every action of the dominant controller(s) there is an equal opposite reaction of the contestants in the game for control*. Hence, the effective value of the firm is given as:

$$V_{S*} = \alpha_n IR - \alpha_n (1-s^*) IR] + [\acute{\alpha}_n (IR) - \acute{\alpha}_n (1-¢^*)\, s^* IR]$$

$$\rightarrow V_{S*} = IR[\alpha_n - \alpha_n(1-s^*) + \acute{\alpha}_n - \acute{\alpha}_n(1-¢^*)s^*] \quad (23)$$

At the optimal level, firm value depends on the income, ***R***, generated from the investments, ***I***, undertaken. Hence, removing the scalar ***I*** that is a common coefficient with the value that is derived from the company assets, the final model for *effective firm value* can be given by:

$$V_{S*} = R[\alpha_n - \alpha_n(1-s^*) + \acute{\alpha}_n - \acute{\alpha}_n(1-¢^*)s^*] \quad (24)$$

In the equilibrium, this equation shows the value of the firm that is maximized. Let us assess the first order condition of equation (**24**). The comparative statics that result from the first order conditions of equation **(24)** will enable us to investigate the implication of the model to the firm value.

The first order condition of equation **(24)** will be:

$$\partial V_{S*}/\partial s^* = \alpha_n R - \acute{\alpha}_n(1-¢^*)R \quad (25)$$

The comparative statics resulting by differentiating the first-order condition in equation **(25)** with respect to the parameters ***¢**, α_n, $\acute{\alpha}_n$,*** and ***R*** would be the followings:

1. $$\partial V_{S^*S^*}/\partial ¢ = R - -\acute{\alpha}_n R$$
$$= R(1-(-\acute{\alpha}_n))$$
$$= R(1+\acute{\alpha}_n) > 0 \rightarrow \textbf{(positive)} \quad (26)$$

   Proposition 7: Equation **(26)** suggests that:

   - *Firms with more monitoring costs incurred by the contestant(s) would have higher value*.

   The proposition suggests that firm value increases as the monitoring costs of contestant(s) increase. This is in line with **proposition 3** and **5.** The fact might imply that as monitoring and hence their monitoring costs of the contesting large blockholder(s) increase, the costs of rent extraction by dominant blockholder(s) increases, thus lowering the amount minority shareholders' expropriation. The proposition confirms the suggestion of Shleifer and Vishny (1986) suggestion that large blockholder(s) mitigate the agency problem between shareholders and managers.

2. $$\partial V_{S*S*}/\partial \alpha_n = R - (1-¢^*)R$$
$$= R(1-(1-¢^*))$$
$$= R¢^* > 0 \rightarrow \textbf{(positive)} \quad (27)$$

   Proposition 8: From equation **(27)**, it might be suggested that:

   - ***F****irms with controller(s) having higher cash flow rights and hence higher voting power would have higher value*.

This is in line with the *alignment of interest hypothesis* and **propositions 1, 2,** and **3.** This also confirms the alignment of interest hypothesis of the agency theory regarding managerial ownership and the suggestion of Jensen and Meckling (1976) that higher ownership or cash flow rights by controllers reduces minority expropriation.

3. $\partial V_{S^*S^*}/\partial \acute{\alpha}_n = R - (1-¢^*) R$

$= R(1-(1-¢^*))$

$= R¢^* > 0 \rightarrow$ ***(positive)*** *(28)*

Proposition 9: Equation **(28)** might suggest that:

- *Firms with contestant(s) having higher cash flow rights and hence higher voting power would have higher value*.

This supports the *control contestability hypothesis* and **propositions 3** and **5.**

4. $\partial V_{S^*S^*}/\partial R = \alpha_n - \acute{\alpha}_n (1-¢^*)$

$= \alpha_n (1-(1- ¢^*)$

$= \alpha_n ¢^* > 0$ ***(Positive)*** *(29)*

Proposition 10: Equation **(29)** indicates that:

- *Firms with better investment opportunities (with higher rates of return, **R**) would have higher value*.

As already noted, it might be suggestive to consider both control dominance and contestability at the same time in assessing the control situation in corporations. This necessitates the structural equation modelling. Based on the two models analyzed in *sub-sections 3.2* and *3.3* the basic theoretical structural equations model from the firm value equation (**24**) for performance, and the control dominance and contestability, equations (**11**) for dominance and (**17**) for contestability, are given as the following three *theoretical structural equations* when we remove the scalar IR (La Porta et al, 2002; Maury and Pajuste, 2005; Gutierrez and Pombo, 2009).

$$\left\{\begin{array}{lllllllll} V_{S^*} = & [\alpha_n & - & \alpha_n (1-s^*) & + & \acute{\alpha}_n & - & \acute{\alpha}_n (1-¢^*)\, s^*] \\ U_D = & [\alpha_n & - & \alpha_n (1-s)] & + & [s & - & C(s, ¢)] \\ U_C = & [\acute{\alpha}_n & - & \acute{\alpha}_n (1-¢)\, s] & + & [(1-¢)\, s & - & C(s, ¢)] \end{array}\right\} \quad (30)$$

5.3.5 Structural Framework of Control Dominance-Contestability

5.3.5.1 The Structural Framework

The theoretical models presented, particularly the *control dominance-contestability model,* provide bases for the specification of a broader theoretical model that incorporates other control factors. The theoretical frameworks in turn guides to the structural modelling of *control dominance-contestability* and the formulation of hypotheses to be tested and analyzed. The interpretations of different relationships and comparative statics would be used in the following section together with the suggestions and theories in literature in order to develop specific empirical models that account for the other variables such as the internal and external corporate governance mechanisms.

We consider that the costs and benefits of control dominance and control contestability are endogenously determined in the interaction with other factors in determining firm performance. Hence, before developing testable *empirical equations model* we depart from the direct use of equation (**30**) and refine it to a broader *theoretical structural equations model* in order to explore the determinants of the left hand side of the equations retaining the elements of control dominance and contestability. Moreover, in the structural framework, it might be suggestive that there is interaction between control dominance and control contestability that might lead to the optimal control system of corporations and this should also be accounted for in the system. Additionally, the consideration of different control factors involved in corporate control and their relationships is required to arrive at the theoretical model.

5.3.5.2 Control Factors and their Network Relationships

Research in corporate finance in general, and in corporate governance in particular, reveals that there is endogenous relationship between the control forces operating on the corporation and influencing its financial decisions (Wintoki et al., 2009). These corporate control forces are broadly classified by Fama and Jensen (1983) and Jensen (1993) as internal governance (board structure), capital markets, product and factor markets (mainly takeover markets, debt financing markets and managerial labor markets), and the regulatory framework. In a broader context, the popular assumption is that different governance mechanisms like the stock market, the takeover market, and expert boards (Fama and Jensen, 1983) and others like debt and managerial labour market (Agrawal and Knoeber, 1996; Weir et al. 2002; and Gillan, 2006) exist in the corporate environment and influence corporate control. These internal and external governance mechanisms that make up a whole system of corporate control form network-type relationships with each other.

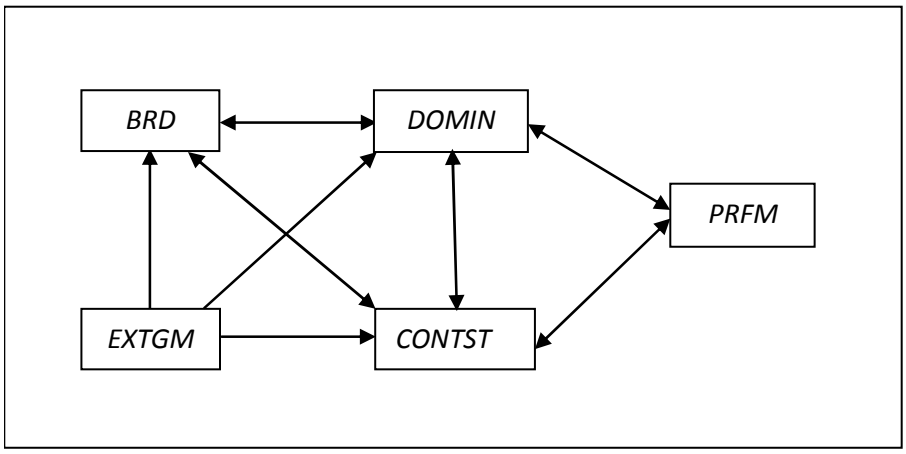
Hence, it is important to control for board structure, external governance mechanisms (takeover markets, debt financing, and capital markets) in the structural framework in the analysis of the interaction between control dominance and contestability in corporations and their impact on firm performance. In determining the performance of corporations (PRFM), we assume that there is a network relationship between different factors that should be considered in the structural modelling. These factors, which are discussed in details later, are mainly *control dominance* (DOMIN), *control contestability* (CONTST), *board characteristics* (BRD), and *external governance mechanisms* (EXTGM, namely, takeover market and debt financing) (*table 5.1).*

Table 5.1: Symbols or abbreviations and description of performance and some control factors

Symbol	Descriptions
PRFM	Firm performance
BRD	Board of directors
DOMIN	Control dominance
CONTST	Control contestability
CEO	Chief executive director
DUAL	CEO-duality
PNED	Representation of non-executive directors
EXTGM	External governance mechanisms
TOINT or TOINTENS	Takeover intensity
TDTA	Debt financing; total debt to total assets
PVOL	Stock price volatility
EQTO	Equity turnover

Hence, the structural equations model assumes that PRFM, BRD, DOMIN, and CONTST are endogenous variables within the model, whereas EXTGM and other stock market factors are considered as exogenous. One important assumption is that firm performance and governance mechanisms are jointly determined as some researchers like Barnhart and Rosenstein (1998), and Hermalin and Weisbach (1988) suggest. So, the *path model* of the framework for the structural system is presented as *figure 5.1* below.

Fig.5. 1: A simple path model of the structural equations model of corporate control and firm performance



Source: Own construction.

Having identified the main control factors that interact and impact each other in the structural system and the simple path model, it is vital to assess their relationships and the endogeneity or reverse causality perspective. This will be discussed in the following subsections.

5.3.5.3 Endogenous Relationships

According to the agency theory, the *board of directors*, especially the non-executive members of the board, plays a monitoring role in disciplining the behaviour of managers as an internal corporate governance mechanism (Fama and Jensen, 1983). The recommendations of the UK corporate governance Codes supports this principle. Hence, the board mitigates the agency problem and

reduces the agency cost, and thus, enhancing firm performance. Walsh and Sward (1990) suggest that since the board of directors is responsible for developing and implementing the internal governance mechanisms and to scrutinize the highest decision makers in the firm, the decisions and the actions of the board also compromises firm performance. This suggests that the path of causality is from board structure to firm performance.

Moreover, research literature suggests that firm performance and board structure are endogenous variables that are jointly or simultaneously determined. Regarding this, Hermalin and Weisbach (2003) suggest that firm performance is a result of both the actions of previous directors and itself and also a factor that potentially influences the choice of subsequent directors. They also suggest that firm performance and changes in ownership structure are important factors effecting the change in boards. Thus, it is suggestive that there is a reverse causality between board structure and performance on the one hand and between board structure and ownership structure (*figure 5.1*).

However, since the current firm performance is within a short time horizon to induce dynamism in changes in ownership structure, and we assume that the current performance might have very little effect on ownership structure, only previous firm performance is assumed to affect the board of directors. Regarding this, Wintoki et al. (2009) argue that there is endogeneity inherent in the board structure-performance relation and that the past performance induces a positive bias when measuring the effect of board structure on the current firm performance and a negative bias when measuring the effect of, for example, board size on firm performance with a static fixed-effect regression. Putting in other words, they suggest that past performance can affect current board structure indirectly, whereby board structure is related to past performance through the effect of performance on other firm characteristics that also determine the board structure. More broadly, they suggest that performance has a strong, immediate and persistent effect on governance (including board structure). So this suggests that the causality path also goes from firm performance to the board of directors and that board structure is *dynamically endogenous* with respect to performance. Hence, the endogeneity between performance and board structure is usually highlighted as a *reverse causality problem,* which complicates empirical modelling and methodology in research.

The dominant and contestant control forces that play decisive control and monitoring role respectively in the firm's decision making and strategy and regulatory formulation arise from two forces: (1) the control forces within the board, and (2) the control forces of blockholders (insider owners and external blockholders). Firstly, the sources of control forces within the board that are of research interest to this study are CEO-Duality (DUAL), which is assumed to be the dominance control force of the board, and the proportion of nonexecutive directors (PNED), which is assumed to be the contesting force to the CEO domination. This implies that DUAL proxies DOMIN, whereas PNED proxies CONTST within the board. The presence of these dominance and contestant control forces within the board complicates the relationship between the board structure and firm performance since the two parties that always coexist might arguably have the moderating or the substitution effects on the control actions and decisions of the board that might influence firm performance. Besides impacting performance, it is also suggestive that there might be relationship between the two board control forces. The nonexecutive directors are nominated by the management (CEO), which question their independence; and they elected at the General Meeting by shareholders. This might suggest that there a causal relationship that goes from the CEO to

nonexecutive directors. On the other hand, the nonexecutive directors have the power to hire or dismiss the CEO and the executive directors. This fact might be suggestive that there is a causal relationship that goes from nonexecutive directors to the CEO. Hence, we have the reverse causal relationship between the CEO and nonexecutive directors.

Secondly, the dominance and contestability control forces might also arise from large blockholders (insiders and outsiders) that influence strategy and regulatory formulation. These forces are represented in our model as DOMIN and CONTST that are found between BRD and PRFM. This complicates the relationship between board structure and firm performance further. Assuming that their control power is dependent on their voting power, we measure the DOMIN and CONTST forces by cash flow rights of the blockholders or coalitions of blockholders in the firm. The pattern of dominance and contestability control forces that are derived from the multiple blockholders in the firm and that interact and share control power in the firm is referred to as *blockholders structure*.

One issue to account for in this setting is the endogeneity of ownership structure reported in research literature (Demsetz, 1983; Demsetz and Lehn, 1985; Demsetz and Villalonga, 2001; Kole, 1995; Agrawal and Knoeber, 1996; Himmelberg et al., 1999; Weir et al, 2002). Regarding this, Demsetz (1983) suggests that ownership structure is endogenously determined, whereby it is influenced by several factors in the competitive environment and firm performance. It follows that the past performance can have correlation with the current disturbances in ownership structure variables. This suggests a backward looking dynamic endogenous relationship between ownership structure and firm performance, and thus, the reciprocal relationship between ownership structure (DOMIN and CONTST) and PRFM as designed in our path model. Supporting this fact, research literature suggests that as ownership structure impacts firm performance, firm performance also influences ownership structure (Kole, 1996). On the other hand, although it is arguable that the expected performance can also cause change in current ownership structure when management varies their share holdings (Demsetz and Villalonga (2001), thus suggesting backward looking dynamic endogeneity that might show up when we use panel data, this research is delimited to account for it in order to avoid further complication of the structural framework.

Last but not least, we also assume that the board (BRD) and control dominance and contestability factors are also affected by external governance mechanisms. The main external governance mechanisms (EXTGM) we consider in the structural system are: takeover market (proxied by takeover intensity, TOINTENS) and debt financing (proxied by debt ratio, TDTA). The additional stock markets variables used are stock price volatility (PVOL) and equity turnover EQTO). In *figure 3.1*, it is shown that the variables impact the board, dominance and contestability factors. Since all the external control forces are outside the firm, the board might not be able to induce change in external governance mechanisms. Hence the causation path is only from EXTGM to the board, DOMIN and CONTST. Finally, the other joint endogeneity relationship to be considered and discussed in the following section is the substitution or complementarity effects between EXTGM and the internal governance mechanisms.

Moreover, research literature reveals that the relationship between corporate governance mechanisms might be explained by the substitution and or complementarity effects. Walsh and Seward (1990, Rediker and Seth (1995), Agrawal and Knoeber (1996), and Weir et al. (2002) assumes that a bundle of the mechanisms may work together, depending on each other or substituting for

each other in controlling the agency problems and enhancing firm performance. Regarding this, Rediker and Seth (1995, p.87) suggests the theoretical perspective that *"it is likely that firm performance depends on the efficiency of a bundle of governance mechanisms in controlling the agency problem, rather than the efficiency of any single mechanism''.* The implication is the substitution hypothesis which suggests that (1) the impact of a single governance mechanism might be insufficient to achieve the efficient aligning the manager-shareholder interests and (2) different governance mechanisms may substitute for each other.

Hence, another way of explaining the relationship between corporate governance mechanisms is that: the way they are arranged and interact might result into the substitution or complementarity effects. Jensen and Meckling (1976) suggested the *substitution hypothesis* when they state that the divergence of managers from shareholder value will also be constrained by market for the firm itself, the capital markets, which gives, not only insider owners, but also other owners a means of selling their shares and will impact change in ownership structure. This explains an instance of substitutability effect between the capital markets and the ineffective internal governance mechanisms (the board structure). Similar effects might exist between concentrated ownership and the takeover market. Walsh and Seward (1990) suggest that all of the internal and external control mechanisms are inextricably linked and that they are different alternative responses to similar problems, thus implying the substitution hypothesis.

Moreover, the governance mechanisms are regarded as interrelated complementary ways to oversee the conduct of management in making discretions on the company affairs. For example, the managerial labour market may be complementary to the takeover markets, and the external large shareholders monitoring might be complement to takeover markets in the removal of inefficient managers. Agrawal and Knoeber (1995) suggest that higher insider ownerships, higher institutional ownerships, higher external blockholdership and higher representation of outsiders on the board might have positive correlation, and hence, might facilitate takeover markets due to lower transaction costs and the reduction of free-rider problem that might lead to the small shareholders' rejection of the tender offer. Likewise, the gain from stock price appreciation during contests might tempt insider ownership with high stakes to assist the takeover market by making insiders less resistant to takeover.

5.4 HYPOTHESES DEVELOPMENT

5.4.1 Ownership/ Control Concentration and Firm Performance

The impact of the increase or decrease of ownership concentration on firm performance has been a theme of research and debate for decades now. The principal-agent theory suggested by Jensen and Meckling (1976) makes the baseline assumption that starts with the dilution of share ownership by the owner-manager who sells part of the stakes to outsider shareholders. According to the suggestion, this will gradually lead to the formation of significant blockholders that try to monitor the behaviour of the initial owner-manager's consumption of perquisites and diversion of firm's wealth. Hence, it might be suggestive that this is the root for contestability of control in corporations and hence contestability of control is inherent in the agency theory.

The theoretical explanation of ownership concentration can also be related to the incentive alignment and the entrenchment hypotheses of the agency theory. It is arguable that ownership concentration fundamentally constrains managerial diversion from shareholder interests by determining the distribution of voting power and the control among shareholders (Leech and Leahy, 1991). Since ownership concentration can measure the power of shareholders to influence managers, it is arguable that concentrated ownership, which concentrates the voting power, might counteract corporate diversification and increase shareholder value (Thomsen and Pedersen, 2000) due to the alignment of interest and the private or shared benefits from control. Moreover, Denis and McConnell (2003) write that concentrated ownership most often has a positive relationship with firm value. Moreover, it is suggested that the greater the diffuseness of ownership (decrease in ownership concentration) the greater is the incentive for shirking by owners; and the cost of owner-manager's shirking that will be shared by all owners in proportion of the stakes (Demsetz and Lehn, 1985). Hence, these facts regarding the incentives for shirking by owner-manager or large owners with the decrease in ownership concentration might imply that ownership concentration has a positive association with firm performance.

The contrasting view is that the increase in ownership concentration has the danger of entrenched block shareholders that may lead to the expropriation of minority shareholders and decrease in firm value. It is arguable that concentration of ownership in the hands of large blockholders and hence the capacity of blockholders to influence corporate decisions might have its drawbacks because according to the second-order agency theory they might pursue their own goals and extract private benefits at the expense of minority shareholders (Burkart et al., 2000) and hence might reduce firm performance.

However, there are arguments stating that the relationship is not uniform and systematic. Fama and Jensen (1983), Morck et al. (1988), and Shleifer and Vishny (1997) suggest that the relationship between ownership concentration and firm performance need not be uniform. The view is that the relationship might vary with firm-specific, owner-specific, and governance mechanisms set in place. On the other hand, Demsetz (1983) provides a theoretical argument of no systematic relationship between ownership concentration and firm performance, stating that ownership concentration is an endogenous outcome of the balance of the costs and benefits of ownership and other environmental factors. Hence, the different views show that the issue is still open for further debate

and research. In order to investigate the effect on firm performance, this research treats ownership concentration from control dominance and contestability approach.

Gomes and Novaes (2001) consider the control setting in which the control group is formed by all large shareholders. Such a controlling group that might require unanimity in decision-making will only approve an investment project if it benefits all members of the group (Bennedsen and Wolfenzon, 2000; Bloch and Hege, 2001). The effectiveness of unanimity might depend on the number of blockholders in the group or coalition. Moreover, discussing the legal determinants of multiple blockholders, Bloch and Hege (2001) postulate that the high level of investor protection leads to more frequent presence of multiple blockholders. Hence, the number of all blockholder (NBH) can be a proxy to measure control related to ownership or blockholder concentration. In investigating the relation between the number of blockholders and firm performance, this research uses the aggregate number of all blockholders (ABH). It might be arguable that the 3% cut-off level that is based on the UK disclosure level is too low for the ability to exert enough control pressure. However, it might be suggestive that 3% voting power can be very decisive in determining outcome of voting, decision and of coalition formation, which is the basis for our SEM model in investigating control dominance and contestability.

We use the *theory of collective action* to discuss the role of the number of blockholders in the control of corporations. The theory says that the group size (blockholder size in our case) is important in facilitating a non-free-riding collective group for collective action (Olson, 1965). Rock (1991, p. 454) writes that the collective action problem emerges as soon as there is more than one owner and disciplining management becomes necessary. Olson (1965) and Rock (1991) argue that in the presence of more than one large blockholder, the small privileged group benefits from the collective good, namely monitoring, when the benefit of collective good is more than zero; and when there is no single large blockholder with the incentive to monitor management, the benefit from the collective good is less than zero, the group benefiting from the good constitutes a latent group. When the group is small, or privileged, each member in the group, or at least some of them have the incentives to ensure that monitoring is provided even if it has to bear the full cost alone (Olson, 1965; Udehn, 1993). It is not only private or individual incentives driven from interests but also a number of social incentives like friendship, social status, prestige, etc. that works in favour of collective monitoring (Olson, 1965; Udehn, 1993). Hence, this indicates that free-riding is not a problem if the group is small, or privileged.

However, as size of the group increases, there is a decrease both in the relative importance of each member's contribution to monitoring and in each member's share stake (Udehn, 1993). With moderate and large size of the group, the problem of free-riding will be worse and dominates the corporation (Udehn, 1993). Hence, the number of blockholders in the control or monitoring group is important in the effectiveness of the control of the firm, barring or enabling managers to pursue their own interests at the expense of shareholders. Hence, based on the theory of collective action *negative* association between the number of blockholders and firm performance is expected.

However, Gomes and Novaes (2001) suggest that due to the requirement of unanimity, increasing the number of blockholders in the group has two effects on each member of the controlling group. The first is the *bargaining effect*, which is dominant as the number of controlling blockholders decrease, might result in less likelihood of private benefits driven rent extraction. Hence, the

bargaining effect implies that *positive* relation between the number of blockholders and firm performance is expected (Gomes and Novaes, 2001). Empirical evidence from Gutierrez and Tribo (2004) confirm this positive association for Spanish firms. On the other hand, the *disagreement effect* that impacts the difficulty in approving positive net present value (NPV) projects is dominant when the number of controlling blockholders increases. Gomes and Novaes (2001) also state the increase in the total ownership stake will make both effects stronger, if the number of blockholders in the controlling group is kept constant. This also implies that a negative relation between the number of blockholders and firm performance is expected.

In order to define or measure ownership concentration we assume that the ownership is concentrated in the hands of few significant blockholders owning significant proportion of the firm's outstanding equity and that it is related to the stakes of large or controlling blockholders. Hence, we define *ownership concentration* as the proportion of outstanding shares cumulatively held by all blockholders owning at least the disclosure level in the UK, following Wruck (1989), who defines ownership concentration on the basis of share ownership of managers, directors, and 5% or greater beneficial owners (aggregate of blockholdership) reported. Hence, the computation of ownership concentration considers the cash flow rights of the significant blockholders as a base (Wruck, 1989). Hence, assuming that all significant blockholders might have the incentive to influence control through efforts of monitoring and willing to bear the costs of monitoring, the *aggregate blockholder ownership stake (ABHO)* will be used as a proxy to measure ownership concentration variable in the analysis of the impact of shared control on firm value.

To sum up, even though there are the appropriation hypothesis and the proposition of Demsetz and Lehn (1985) of no systematic relationship due to endogeneity of ownership concentration, we hypothesize the following using the alighnment of interest hypothesis and the argument for the bargaining effects in the theory of collective action.

> ***Hypothesis 1:*** *There is a positive relation between ownership concentration and firm performance.*

5.4.2 The First-Two Competing Blockholders and Firm Performance

The Model of First-Two Competing Blockholders: VPC1-VPC2 Model: Much of the views of the existing agency theory deal with the agency problems that arise from two extreme ownership structures: (1) the baseline assumption of owner-manager or 100 percent dispersed ownership or (2) one large, controlling owner combined with small, diffuse shareholders (Jensen and Meckling, 1976; Grossman and Hart, 1980, 1986, 1988; Shleifer and Vishny, 1986; Harris and Raviv, 1988; Stulz, 1988; Hart and Moore, 1990; and Burkart et al., 1997, 1998). It is stated that control is optimal when a firm is 100% owned by a shareholder, which is an ultimate controller (Leech, 1988, 2004). However Leech (1988) argues that even control dominance amounting to practical control can arise from substantial minority ownership. Hence, in the context of one large controlling blockholder, even though the legal control by the first largest blockholder requires a majority holding (Leech, 1988), the control power might still be contested by the second largest blockholder that might have the incentives to monitor the dominant controller. This suggests the *contestability of control hypothesis* regarding the interaction and competition for control between the first and the second largest blockholders (C1 and C2).

The resource-based approaches suggests that the power to control is determined in terms of the resources from which it derives – in the context of the ownership control of different shareholders, and in terms of the voting rules defined in the firms regulations (Leech, 2004). Hence, it can be argued that the way in which shares are distributed among shareholders determines the power of each blockholder, especially the largest shareholder; and that the largest blockholder might exert control pressure if the remaining shares are widely dispersed (Burkart et al, 2000; Laeven and Levine, 2008). However, the view that assumes the first largest blockholder as sole ultimate firm controller is just a theoretical assumption which ignores the contest of contestability of control that might affect the behaviour of the ultimate controller. This study deviates from this assumption.

On the other hand, Bloch and Hege (2001) present a simplified model of the scenario in which there are two large blockholders that compete for control. Since they are the two most contending forces for control power, it might be expected that they monitor each other's action while controlling or monitoring the management of the firm. Bloch and Hege (2001) argue in their two competing blockholders model that control is more contestable between the two largest blockholders, and hence minority expropriation will be lower. This might be more viable in firms where there are smaller differences in stakes of the two blockholders and the ability of the blockholders to define strategy of the firm (Zwiebel, 1995).

Moreover, the two competing large blockholders might have different capacity to define the company strategy and their ability to monitor manager. In order to win control the two blockholders compete for the votes of minority blockholders by reducing their private benefits. Bloch and Hege (2001) suggest that the presence of two large blockholders might have a positive impact for the firm since it acts to limit the extraction of private rent and to attract the votes of the minority blockholders when proposals are contested. The winner blockholder in the competition defines the strategy though both parties play a monitoring role bearing monitoring costs. So, the high competition arising from their incentives to control and their ability related to small difference in their ownership rights between the two blockholders contending for control has a positive impact on firm performance. In contrast, when their relative ownership size has big difference, contestability between them might be reduced, and the largest blockholder might attempt to define strategy that favours its own interest and divert rent, hence leading to reduction of firm performance.

This research follows Block and Hege (2001) in assuming that the first two largest blockholders compete for control. However, deviates from the model assuming that C1 with voting power VPC1 is *ultimate controller*, and C2 with voting power of VPC2 is *ultimate contester* in the competition for control. From hereof, we refer the two contenders as the *'First-Two'* and that control by the first largest blockholder is contested by the second largest blockholder. This first version of our control dominance-contestability model is referred to as the *model of the first-two competing blockholders or VPC1-VPC2 Model* in short. Below, the first and the second largest blockholders are discussed briefly from the theoretical perspectives and the rationale behind their potentiality as dominant controllers and contestants respectively.

The First Largest Blockholder (Ultimate Controller): Studies on ownership and control structures in corporations have followed different approaches to identify and measure dominant and contesting controllers or coalitions of the firm. The first methodology is that of La Porta et al. (1999), which defines firm's ultimate controller as the blockholder having direct and

indirect voting rights that exceed a 20% threshold. Other researchers Claessens et al. (2000), Faccio and Lange (2002) and others followed this methodology. However, we do not use the *presence of such ultimate* blockholders at a certain threshold since we seek to attain a measurement that has ratio or interval scales and since we are interested in the voting rights that gives the ability to exert control pressure in firms. Moreover, we have attempted and found it unwise to use the 10% or 20% for the *presence of ultimate control* for the UK firms since (1) we assume that there are two blockholders that are large enough to compete for control in terms of their block size or voting power following Bloch and Hege (2001) model, and (2) the use of the *presence of the blockholders* at the thresholds results in the dummy values that leads not only to the exclusion of large blockholders with control potential but also to the exclusion of significant number of firms that are without blockholders below the thresholds from the sample of the panel data, thus making the sample unrepresentative.

Hence, in this research we define ultimate controller as the first largest shareholder in the firm whose control power is measured by the voting power attached to its blocks of shares in the firm at the 3% threshold level, since the blockholders are known for all firms in the sample and might therefore more easily identifiable and might attract attention to their views. So, we use the voting power or stakes of such blockholders hold, *VPC1,* as proxy for ultimate controller. This variable has observations for all firms in the sample and much better than dummy variables; and it might be a proxy that might reveal the impact of ultimate controller on firm performance. Nevertheless, the attempted use of insider owners as ultimate controllers to differentiate from outsider owners is dropped because of the rare cases or observations of insider ownership (only about 119 out of 2883 firm years) in UK firms in our panel data. Additionally, the option to investigate the impact of institutional investors as ultimate controllers is also dropped since (1) we have to be selective in the SEM in choosing pairs of control factor variables that are dominants and contestants, (2) the corresponding possible control dominance variable – insider owners – is not viable for use due to the reason mentioned above, and (3) checks made show that they generally show no significant effect on firm performance.

Regarding the first largest blockholder, Jensen and Meckling (1976) argue that as the ownership stake of the owner-manager decreases, the tendency of the first controlling largest blockholder to expropriate minority shareholders increases, thus leading to reduction of firm value. Moreover, in model of two competing largest shareholders, the largest controlling blockholder winning in the vote might define strategy or makes decisions that might maximize own utility at the expense of other shareholders engaging in rent extraction, thus decreasing firm value or performance (Bloch and Hege, 2001). Hence, negative relationship between the voting power of the first largest shareholder and firm performance is expected. In contrast, based on the premise of the incentive alignment hypothesis (Jensen, 1993), as the stake of the largest blockholder increases, the rent extraction by the largest blockholder decreases since the benefits they get is in proportion of their cash flow right. Additionally, in the UK case, minority shareholder protection might limit also exploitation. Therefore, we expect a positive relationship between the stake of the first largest blockholder and firm performance.

The Second Largest Blockholder (Ultimate Contester): The control contestability hypothesis posits that the dominant controller or controlling coalition always faces contesting blockholder or coalition of blockholders that is in work to counter-balance its actions (Leech, 1988).

Regarding this, Pagano and Roell (1998) argue that large shareholders beyond the largest shareholder will monitor the controlling blockholder and reduce the diversion of resources for private benefits. More specifically, Bloch and Hege (2001) emphasize that the larger owner contest control and reduce rent extraction only when the second largest blockholder is sufficiently large relative to the largest blockholder. These arguments might lead to the insight that control with the ultimate blockholder is contestable and that the second largest blockholder is the contestant to the incumbent first largest blockholder in the first version of our model.

Literature search reveals that the contesting power and role of the second largest blockholder lacks theoretical underpinning and empirical investigation. However, the presence of the second largest blockholder is well documented in literature. Bloch and Hege (2001) report that the median of the second largest voting bloc in large public listed firms in 9 largest stock markets in the European Union exceeds 5% (ECGN result). This significant position and the fact that the second largest blockholders are present almost always in every firm make the use of VPC2 as a contestant in the control power structure of the firm.

Empirical evidence regarding the relation between the second largest blockholder and firm performance is quiet few, and they exhibit the same evidence. Lehman and Weigand (2000) provide empirical evidence that the presence of a strong second largest blockholder improves the profitability of German listed firms. Laeven and Levine (2008) also find that Western European firms with large blockholders have higher Tobin's Q than firms with only one big shareholder, and that widely held firms have the highest Tobin Q. These evidences reveal that control contestability where the second largest blockholder enhances firm profitability. Even more stringently, Maury and Pajuste (2005) find evidence that the existence of the third largest blockholder enhances firm value when 2 blockholders with similar interests exist.

To sum up, we argue that the second largest blockholder has the incentive to monitor the incumbent ultimate controller and reduce rent extraction in order to attain benefits in proportion to the cash flow right. Hence, as the voting power of the second largest blockholder increases, we expect that the dominance position of the ultimate blockholder (the first largest blockholder) declines and firm performance will increase. Finally, since there might be interaction to dominate and to contest between the opposing parties, it is also arguable that there is inverse relationship between the first and the second largest blockholders. So, based on the theoretical arguments above and **propositions (2-6)** of the theoretical model in the previous section, the possible hypotheses tested are summarized as follows:

> ***Hypothesis 2a:*** *The increase in the voting power of (or the concentration of power in the hand of) the first largest blockholder will increase rent diversion and hence decrease firm performance.*
>
> ***Hypothesis 2b****: The increase in the voting power of the first largest blockholder will neutralize the interest of rent diversion due to alignment of interest and hence will enhance firm performance.*
>
> ***Hypothesis 2c:*** *Due to the presence of minority shareholder protection in the UK that might reduce expropriation, the voting power of the first largest blockholder as a controller has a positive or no systematic association with firm performance in the UK listed firms.*

Hypothesis 2d: *The control dominance power of the first largest blockholder is contested by the second largest blockholder in which the second blockholder exerts its voting power and or monitoring role in order to scan the behaviour and action of the first largest blockholder and to recover the rents to be diverted and hence will enhance firm performance.*

Hypothesis 2e: *The dominance of the first largest blockholder has a negative association with the contests of second largest blockholder or vice versa.*

5.4.3 Dominant and Contestant Coalitions and Firm Performance

5.4.3.1 Introduction: Collective Actions in Control

In the presence of other large blockholder (minority blockholders) that have large weight in voting power in a firm, the power of the largest blockholder might be too low to exert direct and effective control. In this case the first largest blockholder control power position would be contested (Leech, 2004). Moreover, with the reduction in the size of the ownership stake of the unique large shareholder, there might be reduction in its incentives to control (to monitor, or preserving managerial initiative) the firm (Burkart et al., 1997, 2000), and the possible increase in the number of blockholders competing for control with their voting power and the contestability of control. Hence, this might create the need to form coalitions in order to exert effective control to dominate or to monitor the firm. This section will deal with the second alternative in which there are dominant coalition and a contesting coalition.

Moreover, regarding minority blockholders, Zwiebel (1995) argues that the ability of smaller blockholders to share the private benefits from control is reduced if one of the blocks in the group is much larger than the others. Furthermore, he shows that at a certain threshold, due to the difference in size of the voting rights of different minority blockholders, the largest blockholder might not be challenged by other smaller blockholders. Hence, as the stake of the largest blockholder increase, the probability of control as a group will decrease. Hence, in the equilibrium state, it might be possible that the control of the firms can be either by (1) only one large blockholder with blocks above a certain cut-off, and (2) a group of several blockholders of medium size blocks below the threshold (Gutierrez and Tribo, 2004).

Furthermore, it is arguable that minority blockholders holding lower stakes than the larger or largest blockholders do not wield or exert their control power. On the other hand, it might also be arguable that minority blockholders can increase their ownership stake a bit and might wield control so as to discipline management. Regarding this, Butz (1994) states that one way in which such a minority blockholder can wield control is by exercising the voting rights so as to favourably change the composition of corporate boards. Hence, it might follow that the votes of minority blockholders is important for larger blockholders competing to ensuring control or for posing control contests by forming coalitions for *collective actions.* So, two forms of coalitions might arise in a firm, namely *dominant coalition* that colludes for collective actions of maintaining control and *contesting coalition* that colludes for collective actions of monitoring the incumbent controller(s).

The problem related to the formation of a group of some or all blockholders for collective action is the heterogeneity of the members in the group. The traditional theory of groups asserts that group of individuals having common interests will cooperate in order to pursue the shared benefits of

interests. This implies that group formation for collective action in order to seek collective good is an easy matter, and heterogeneity does not matter a lot. In contrast, the *theory of collective action* of Olson (1965) suggests that rational, self interested individuals *will not act in large groups* to further their common or shared interests unless they are induced to do so by *coercion* or by some *separate and selective incentives* that make them act. From this it might be suggestive that fewer blockholders might be engaged in collective action in smaller groups in order to pursue common interest. Regarding this view related to corporate control Andres (2008) argues that it is much easier for large blockholders to coordinate their actions and put pressure on managers. Based on this argument, it might also be suggestive that large shareholders in the dominant and contesting coalition coordinate their voting power in their decisions to control and contest respectively.

One important aspect of a coalition is that group members might differ substantially in their interests and resources that might affect the level of collective action expected from the group (Olsen, 1965; Oliver and Marwell, 1985). However, it might be the case that group heterogeneity is favourable for collective action (Olson, 1965; Hardin, 1982; Oliver et al., 1985; Oliver and Marwal, 1988), and that there might be difference in the participation or contribution of each member in the group based on the level of interest (ownership stake in our case). Even so, it is suggested that those with small interest would exploit (by not contributing/ participating) those with big interest; and those having a very large interest in the collective good (monitoring or control in our case) might provide the good themselves regardless of the actions of those with small ownership interests (Olsen, 1965; Oliver et al., 1985). By extension, it is arguable that even though the significant blockholders are heterogeneous, they might be coerced by their relatively larger interests in firms that induce them to care about their cash flow rights and to participate in the collective action or to contribute to the collective interests by affording the costs associated with control. This is consistent with the suggestion of Shleifer and Vishny (1986) that large investors provide a solution to the free-riding problem since it pays for them to spend private resources to monitor management due to their large stake.

Nevertheless, the willingness to contribute towards a public good depends on the size of the participants (Olsen, 1965). If the size of blockholders is large, the members of the group would never contribute towards the provision of a public good (Olson, 1965) due to the problem of free-riders. The free-rider hypothesis extensively suggested in literature presupposes that not participating or contributing to the collective good will discourage the actions of those participating or may lead to the diversion of the benefits coming from the action to themselves (Grossman and Hart, 1980; Hart, 1995). Hence, in the UK case, where ownership of listed firms is widely dispersed, the number of blockholders is not low and it might be difficult for a single blockholder to exert absolute control. It is arguable that passivity might bring more harm than the monitoring cost, and the vested interest in the firm might motivate or even compel fewer blockholders to form a blockholder coalition that bears the costs associated with collective action. Moreover, since the cost of monitoring good is shared among the members of the coalition, it might be affordable for individual group member to contribute to it; and as the group member increases the level of cost borne by individual member might decline.

Finally, based on the fact that (1) few rational and self-interested blockholders might be coerced to act together in a small group derived by common interests according to the theory of collective action, (2) both the dominant controlling coalition and the contesting coalition of large blockholders

might have the ability to bear the costs of controlling only until the marginal utility of its benefit is equal to its marginal cost, and (3) the tight regulation in the UK on overt coalitions or voting pacts might not ensure the viability of a coalition many blockholders, we assume that only fewer numbers of blockholders can collude to form dominant coalitions. So, as it will be discussed in details below, the structural equations model will incorporate the following group control models:

(1) C1C2-'Ocean' or TDPI-SHAPV model: The power index of the coalition of the first and second largest blockholders (C1C2), measured by total dominant power index (TDPI), and the contesting coalition of the 'ocean' (the rest of blockholders excluding C1C2), measured by Shapley values (SHAPV);

(2) C1C4-C2C3 model: The voting power of the *monopolizing coalition* of the first and fourth largest blockholders (C1C4) and the *contesting coalition* of the second and third largest blockholders (C2C3); and

(3) MONR-CONTR model: The ratio the power of the *monopolizing coalition* of the first and fourth largest blockholders to ABHO (MONR), and the *contesting coalition* of the second and third largest blockholders to ABHO (CONTR).

5.4.3.2 Coalition of the First Two Largest Blockholders versus the 'Ocean': *C1C2-'Ocean' o*r *TDPI-SHAPV* Model:

Theoretical literature by researchers like Leech (1987), Zwiebel (1995), Bennedsen and Wolfenzon (2000), and Gomes and Novaes (2001) consider a setting in which a group of large blockholders together hold the majority of the voting rights and control the firm. In the setting, the control benefits, which are in proportion of the respective blocks of shares the blockholders own, might be the driving forces that might unify or initiate the unanimity of the group decisions.

In the formation coalition of few blockholders for control, it might not be ruled out that the first and the second largest blockholders might form a voting pact or coalition in order to control a firm. In contrast to the model of Bloch and Hege (2001) that assumes the first and the second largest blockholders as competing forces, we assume they form a coalition of the first two largest blockholders (C1C2) as dominant blockholder. Moreover, following Shapley and Shubik (1967) and Milnor and Shapley (1978) model we assume that the first two largest blockholders (the First-Two) are controlling coalition while 'ocean' are the contestants to the power of the coalition. The 'ocean' or the 'free float' is a group of the rest of significant blockholders (excluding the first two largest blockholders that form dominant coalition) that might have a cumulative power to contest the colluding power of the first two largest blockholders. So, we assume that some or all of the blockholders in the 'ocean', might undertake the monitoring role to reduce rent extraction.

The power of the coalition of the first two dominant largest blockholders (C1C2) is measured by a proxy called total dominant power index (TDPI), which is derived from the voting power of the first and second largest blockholders, while the power of the 'ocean' is proxied by Shapley values (SHAPV), which is derived from the voting power of the 'ocean'. SHAPV is used as the proxy for the power to contest the dominant blockholders' coalition because it measures the probability that blockholder or group of blockholders form part of the winning coalition (Maury and Pajuste, 2005; Gutierrez and Pombo, 2009).

In order to calculate the TDPI, we follow Milnor and Shapley (1978) computational procedure of Oceanic games in coalition formation. TDPI is the aggregate of the power indices of the first largest blockholder (PI1) and the second largest blockholder (PI2). Hence, in computing TDPI, the power indices of the first and the second largest blockholders should be computed as below. Let *w1* and *w2* be the proportion (weight) of the voting power of the first largest blockholder and the second largest blockholder in the outstanding shares of the firm respectively. The proportion of firm ownership that gives majority or absolute control power of the firm is assumed to be at least half or 0.05. Let *PI1* and *PI2* represent the power index of the first largest blockholder and that of the second largest blockholder respectively. Hence, following Milnor and Shapley (1978) the power indices of the controlling first two largest blockholders and the power index (TDPI) of the coalition of the first two largest blockholders are calculated as:

$$PI1 = \begin{cases} w1/(1-(w1+w2)) - (w1w2)/(1-(w1+w2))^2, & \text{Where } (1-(w1+w2)) >= ½ \\ (1-2w2)^2)/4(1-(w1+w2)^2, & \text{where } w1 <= ½;\ w2 <= 1/2;\ 1-(w1+w2) <= ½ \\ 1, & \text{where } w1 >= ½ \\ 0, & \text{where } w2 >= ½ \end{cases}$$

$$PI1 = \begin{cases} W2\,(1-(w1+w2) - (w1w2)/(1-(w1+w2))^2, & \text{Where } (1-(w1+w2)) >= ½ \\ (1-2w1)^2)/4(1-w1+w2)^2, & \text{where } w1 <= ½;\ w2 <= 1/2;\ 1-(w1+w2) <= ½ \\ 1, & \text{where } w2 >= ½ \\ 0, & \text{where } w1 >= ½ \end{cases}$$

$$TDPI = (PI1 + PI2) \qquad \text{(Total dominant power index)}$$

Moreover, let OHP be the 'ocean' holding power, and OPI be the 'ocean' power index. OHP is 1 minus the aggregate proportion (weight) of voting power of the first two largest blockholders, whereas OPI is 1 minus TDPI. We calculate Shapley values (SHAPV), the contestability variable, as the ratio of the '*ocean' power index* to '*ocean' holding power* (ratio of the OPI to OHP). Hence, the formulas used in the computation are as follows:

$$OHP = 1 - (w1+w2) \qquad \text{('Ocean' holding power)}$$

$$OPI = 1-TDPI \qquad \text{('Ocean' power index)}$$

$$SHAPV = OPI / OPH = OPI/(1-(w1+w2))$$

$$= (1-TDPI)/(1-(w1+w2)) \qquad \text{(Shapley values)}$$

We expect that contestability of the power of the dominant coalition increases as Shapley values decrease. Put it in another way, it is expected that as Shapley values decreases, contestability increases the power to monitor and reduce rent extraction by the coalition or firm performance increases (Maury and Pajuste, 2005; Gutierrez and Pombo, 2009).

Hence, based upon the arguments above on the theory of collective action, **propositions 2-9** in the theoretical frameworks section, and the contestability of control hypothesis, the hypothesis tested is:

Hypothesis 3a: *The collusion of hence the rise in aggregate voting power of the first two largest blockholders might reduce contestability of control by the 'ocean' and thereby reduce firm performance since the coalition of the first two largest blockholders might pursue its own interest and divert rents.*

Hypothesis 3b: *As the contesting power of the 'ocean' increases, the power of the dominant coalition and its rent extraction or diversion declines and hence firm performance increase due to effective monitoring by the 'ocean'.*

5.4.3.3 Model of 'Monopolizability' and Contestability of Control

The more extreme form of control dominance concept to be introduced is the monopolizability of control. It is arguable that presence of contestability of control might tempt the dominating controller to attain absolute control through monopolization of power in firm decision-making. This motivates us to consider the *monopolizability-contestability model* in this research. Hence, for the purpose of this study, *monopolization of control* is defined as the absolute domination of the firm decision-making process via the accumulation of voting blocs that might bar other blockholders from the ability to change the decisions that the dominant favours. Moreover, the extent to which control might be monopolized by a coalition of groups of blockholders is referred to as *monopolizability of control*.

In this version of our model, we assume that this monopolizability of control might also lead to the contestability of control where the second largest blockholder might form coalition with another blockholder in order to at least exert control pressure in the form of monitoring. As in other forms of competitions the contending forces in the firm are in constant games in which the significant players watch each other's action very closely. In the game, the dominating coalition is always the best choice every player aspires for, and it is only if outsmarted that any player or group resorts to accepting the second best solution. This exactly holds also in corporate control games. Hence, the interaction between blockholders derived from their behaviour related to their incentives and interests and the existing level of competition determine the way control coalitions might be formed. When the largest blockholder has not sufficient voting power to attain majority and there are other blockholders with stakes closer in size to that of the largest shareholder, the alternative means of maintaining control position or attaining dominancy or monopoly power is the formation of coalition aimed at blocking the way of contesting group. As in politics or other competitions, the worst foes ever in the control structure are the first and the second largest blockholders if the difference between their voting powers is smaller. So, it is assumed that it might be very difficult for them to form a smoothly functioning coalition since they have voting power generally almost close to each other.

Hence, in such a corporate control setting, the alternative game that the first largest blockholder might play is monopolization game. And knowing this move the game played by the second largest blockholder will be to form a coalition that might check the potential control power of the C1 and to induce C1 to accept at least equal footing or fair game. Having these facts in mind, we consider a more difficult and complex coalition structure. We assume that the first largest blockholder (C1) might always be suspicious of the second largest blockholders (C2) because the later might have the incentive and ability to make coalition with the third largest blockholder (C3) or to make tender offer

by accumulating more blocks of shares in order to attain the monopolizing (absolute) control power. On the other hand, the second largest blockholder, C2, might think that the C1 dominates the control and would block the way of C1 making collusion with C3. It would, however, be easier for them to form coalition with those that readily admit their inferiority in terms of voting power. One final note is that it is rather easier for the opposition forces, even between C2 and C3, to form coalition together since it is a contesting coalition against the dominant (C1). In such instance, in order to sustain the dominance or monopolization of power it is assumed that the first largest blockholder might form coalition with the fourth largest blockholder (C4) and the second largest blockholder might form coalition with the third largest blockholder. Hence, the game of power struggle might be between the coalition of C1 and C4 (C1C4) as a *monopolizing coalition* on the one hand, and that of C2 and C3 (C2C3) as a *contesting coalition* on the other. This research uses two versions of the monopolizability-contestability model, C1C4-C2C3 and MONR-CONTR models.

C1C4-C2C3 model is the version of monopolizability-contestability model that uses the aggregate voting power of the first and the fourth largest blockholder to measure monopolizability of control (C1C4), and the aggregate voting power of the second and the third largest blockholder to measure contestability of control (C2C3). On the other hand, *MONR-CONTR* model is another version of monopolizability-contestability model where we measure the coalition for monopolization and contestability differently using ratios in order to observe the sensitivity of the results on the measures used above. We still assume that coalitions of C1C4 and C2C3 are the monopoly and contesting powers respectively. In order to transform them into ratios we divide them by the aggregate voting power of all significant blockholders (ABHO). Hence, we get *monopolizability ratio* (MONR) and *contestability ratio* (CONTR).

MONR	=	*C1C4)/ABHO*	*Proxy for monopolizability of control*
CONTR	=	*C2C3/ABHO*	*Proxy for contestability of control*

To sum up, if the coalitions are formed so that they might check each other; and they both might negatively impact each other and lead to firm performance. Hence, it is expected that as monopolizability increases, contestability declines and vice versa. If the coalitions are not formed with great disparities in their power, monopolization of power might diminish contestability and increase rent extraction that might lead to decline in firm performance. Hence, based upon **propositions 2-9** in the theoretical frameworks section, especially **proposition 7-9***,* and the theory of collective actions the hypotheses tested are:

> ***Hypothesis 4a:*** *As the voting power of the monopolizing coalition or monopolizability ratio increases, due to the alignment of interests in which the private benefits of control are divisible among the members will increases, firm performance is enhanced.*
>
> ***Hypothesis 4b:*** *The increase in the voting power of contesting coalition or contestability ratio increases firm performance by serving as a monitoring force against rent extraction of the dominant or monopolizing blockholder coalition.*

5.5. METHODOLOGY

5.5.1 Sample and Data

The process in the selection of the the sample and collection of the data on for this study is already explained in *Chapter Four, section 4.4.1.* However, we would note that new variables for the sample are collected or computed and included in the original dataset.

5.5.2 Empirical Model

5.5.2.1 Determinants of Firm Performance

Firm performance (PRFM) might be determined by several internal or external environmental factors. The agency theory posits that it is determined by the board structure and other external governance mechanisms (Jensen and Meckling, 1976; Fama and Jensen, 1983). Hence, BRD and EXTGM are among the determinants of firm performance in our structural model. The causal path of the relationship between the two factors and firm performance has been discussed previously in *section 3*. However, since BRD and EXTGM are related to firm performance through control dominance and contestability (DOMIN and CONTST) and thus have an indirect path to PRFM, we include DOMIN and CONTST as determinants of firm performance in the equation. Moreover, other two stock market factors, namely stock price volatility (PVOL) and equity turnover (EQTO) that are external to the firm are also included in the framework since they might impact firm performance through board of directors and the blockholders control factors.

The traditional price theory predicts that profitability is influenced by various elements of the *market structure and conducts* such as concentration ratio, industry entry barriers, industry advertising intensity, leverage, etc. (Weiss, 1971; Vernon, 1972; Gupta, 1983). Based on the agency perspective suggested by Fama and Jensen (1983), parts of the market structure, namely capital markets that pose the external control pressure on firms are EXTGMs that might determine control forces and indirectly influence firm performance. Since several market and macroeconomic factors that might influence firm performance are common for all firms or at least for those in the same industry, it is not chosen to include them.

However, we need to focus on the *firm-specific characteristics* that determine firm performance. Diverse research literature provides a long list of such firm-specific factors such as research and development expenditure, tangibility of assets, firm advertising and marketing expenditure, firm size, firm age, liquidity, export intensity, growth in sales, product diversification, and etc. In order to avoid the impact of variable proliferation that would complicate the estimation by exerting pressure on the degree of freedom, only firm size (SIZE), firm age (AGE), R&D to sales (RNDTS), fixed asset to sales (FATS), Sales-General-and-Administration expenditure to sales (SGATS) that includes advertising and marketing costs are chosen as *control variables* (CTRL) following the previous research works (Demsetz and Lehn, 1983; McConnell and Servaes, 1990; Leech and Leahy, 1991; Short and Keasey, 1999; Weir et al., 2002). Additionally, it is assumed that the firm past performance determines its current performance and hence the lag of the performance variable ($PRFM_{t-1}$) following Weir et al., (2002). Hence, the performance equation in the structural model is:

$$PRFM = BRD + DOMIN + CONTST + EXTGM + CTRL + PRFM_{t-1} + \varepsilon_1 \quad (Eq.\ 1)$$

5.5.2.2 Determinants of Board Structure

It is noted that board structure is endogenous and that performance affects board structure as board structure affects firm performance (Hermalin and Weisbach, 2003). Following the argument of Hermalin and Weisbach (2003) on the problem of endogeneity, which makes the interpretation of empirical results on board-performance relationship ambiguous, Coles et al., (2003) suggest that the endogeneity problem cannot be corrected with simple econometric methods and hence that the estimation of the complete structural model is rather required. Hermalin and Weisbach (1991) also consider managerial bargaining power and how it affects board performance, whereas Raheja (2005) considers how managerial succession affects board performance.

The UK Code of Best Practice recommends that the proportion of the nonexecutive directors should make at least the majority of the board of directors and that there should be the separation of the roles of the Chairman and the CEO in the board of directors. Based on this and following the study of Weir et al. (2002) and Weir and Liang (2001) on the UK firms, this research will consider *proportion of non-executive directors* (PNED) and CEO-duality (DUAL) as proxies for measuring the control factor measures of the board of directors. The choice of PNED and DUAL is based the duties and responsibilities of the internal control of the firm defined in the corporate Charter and practiced in the UK. The board of directors is comprised of two types of unitary bodies (1) the executive directors headed by the CEO, which are responsible for the day-to-day management of the company, formulate and implement corporate strategy, and thus have the actual control over the firm; and (2) the non-executive directors that are assumed to play the role of effective monitoring and whose effectiveness would increase in line with their board representation (Weir and Liang, 2001). Even though it is questionable, it is assumed that the presence of more non-executive directors in the board might ensure independence of the board from the influence of the CEO who actually runs the daily operations of the firm. In terms of the leadership of the board, *CEO-duality* is assumed to lead to dominance control of the firm by the CEO who also assumes the chairmanship of the board by reducing the possibility of monitoring or counter-checking in the behaviour of the CEO or management and turning the board into a rubber stamp.

Hillier and McColgan (2006) write that corporate board structure is determined by (1) *firm-specific characteristics* and (2) *owner-specific characteristics.* We also include *market-specific* characteristics that are related to governance mechanisms. They note that firm-specific characteristics include the size and scope of operations, firm age, cash flows, the noisiness of operating environments, etc. In this research, firm size, age, research and development expenditure to sales, fixed assets expenditure to sales, and the Sales-General-and-Administration expenses to sales are firm-specific factors that are used as control variables (CTRL) in our analysis. Regarding firm size and age, Raheja (2005) proposes that, all else kept constant, larger and older and more complex firms will require larger boards with a greater number of non-executive directors due to the greater skill and informational requirements required in running such companies. At the same time, increases in firm size and complexity are also expected to correlate with further increases in board size and non-executive director representation in order to add experts in the new fields (Hillier and McColgan, 2006). It is expected that firm size has positive relation with board size and NEDs' representation.

The *owner-specific characteristics* arise as a result of the bargaining process between the firm's top management and outside monitors (Hermalin and Weisbach, 2003). The owner-specific characteristics include control dominance (DOMIN) and contestability (CONTST) variables, which are related to ownership structure. Moreover, based on the structural equation model developed previously, we add the *market-specific characteristics* in to the picture. The market-specific characteristics determining the board structure are the external governance mechanisms (EXTGM, namely Debt financing and takeover intensity) and other relevant stock market factors, PVOL and EQTO. It is expected that takeover intensity (TOINTENS) and EQTO have a positive, whereas debt ratio (DEBTR) and price volatility (PVOL) have a negative influence on board structure (Hillier and McColgan, 2006). Finally, based on the existence of endogenous relationship between past firm performance and board structure previously explained, we include lagged performance variable ($PRFM_{t-1}$) as determinant of the board. Hence, the two board equations in the structural model are:

$$PNED = DOMIN + CONTST + EXTGM + CTRL + PRFM_{t-1} + \varepsilon_2 \qquad (Eq.\ 2)$$

$$DUAL = DOMIN + CONTST + EXTGM + CTRL + PRFM_{t-1} + \varepsilon_2 \qquad (Eq.\ 3)$$

5.5.2.3 Determinants of Control Dominance and Contestability

Literature shows that there are no theoretical or empirical frameworks that suggest the determinants of control dominance and contestability in the internal control structure of corporations. Based on the **propositions** of our theoretical model discussed previously, both internal control factors, namely dominance (DOMIN) and contestability (CONTST) have the reciprocal relationships with each other. Hence, we suggest that the two factors determine each other. The model depicts also that the board structure (BRD) has reciprocal influence with them. Since there is a reciprocal or reversal causal relationship between DOMIN and CONTST and between BRD and the two factors (DOMIN and CONTST), it is difficult to suggest the sign of their relationships now.

Moreover, the causal path relationship goes only from the external corporate governance mechanisms (EXTGM) and other two stock market factors (PVOL and EQTO) to DOMIN and CONTST, implying that EXTGM determines dominance and contestability of control in firms and that DOMIN and CONTST might not determine EXTGM. Considering takeover intensity (TOINTENS), we might expect that as it increases, dominance decreases and contestability to control the firm might increase. According to the capital structure theory the rise in the debt financing (TDTA) might induce financial distress and hence triggers the contesters to monitor the firm, and hence, we suggest that it enhances contestability and reduces dominance in the control of the firm. In contrast, it might also trigger antitakeover contest moves taken by the dominant blockholders that try to keep their control position. Finally, it is expected that price volatility (PVOL) might influence dominance negatively and contestability positively since volatility might induce the strength of the contestant(s) against the dominant(s), and that equity turnover (EQTO) might strengthen or weaken the contestants against the dominant controller(s) depending which party acquires and accumulates blocks of shares.

Furthermore, since board structure is endogenously determined and the internal control dominance and contestability are also endogenously determined with the board structure by firm-specific characteristics, we should consider relevant firm-specific control variables (CTRL) as determinants of DOMIN and CONTST. These relevant firm-specific control variables to be used are already discussed

above. Finally, based on the argument made previously that past firm performance impacts board structure, we suggest that lagged performance variables ($PRFM_{t-1}$) is also among the determinants of control dominance and contestability. Hence, the two board equations in the structural model are:

$$DOMIN = BRD + CONTST + EXTGM + CTRL + PRFM_{t-1} + \varepsilon_3 \qquad (Eq.\ 4)$$

$$CONTST = BRD + DOMIN + EXTGM + CTRL + PRFM_{t-1} + \varepsilon_4 \qquad (Eq.\ 5)$$

To sum up, from the theoretical analysis of the control structure of corporations based on the benefits and costs of control perspective five equations of the empirical SEM are designed. This in turn has necessitated the specification of the implied testable version of the empirical models in the SEM assessing the determinants of the independent endogenous variables. In the following subsection we discuss the choice of instrumental variables of the SEM since the estimation method used to estimate the nonrecursive SEM requires the inclusion of instrumental variables.

5.5.2.4 Identification and Instrumental Variables of the SEM

One of the issues to be handled regarding nonrecursive SEM is the problems of identification. For a nonrecursive model, it is required that the model is identified or overidentified. Underidentification shows *specification error*. Hence, the models *should be uniquely solvable* even in the instances when the degrees of freedom suggest *overidentification*. The *parameters of the SEM* (the structural *coefficients* and the *moments* of exogenous variables and disturbances) are *identified* when they are uniquely determined by population moments of observable variables. When the structural parameter (or combination of parameters) is *identified by more than one function of observable population moments*, the structural model imposes constraints (overidentifying restrictions) on those moments. In this case the parameter (or combination of parameters) is *overidentified*, and the overidentifying restrictions must hold in the population when the specified model is correct.

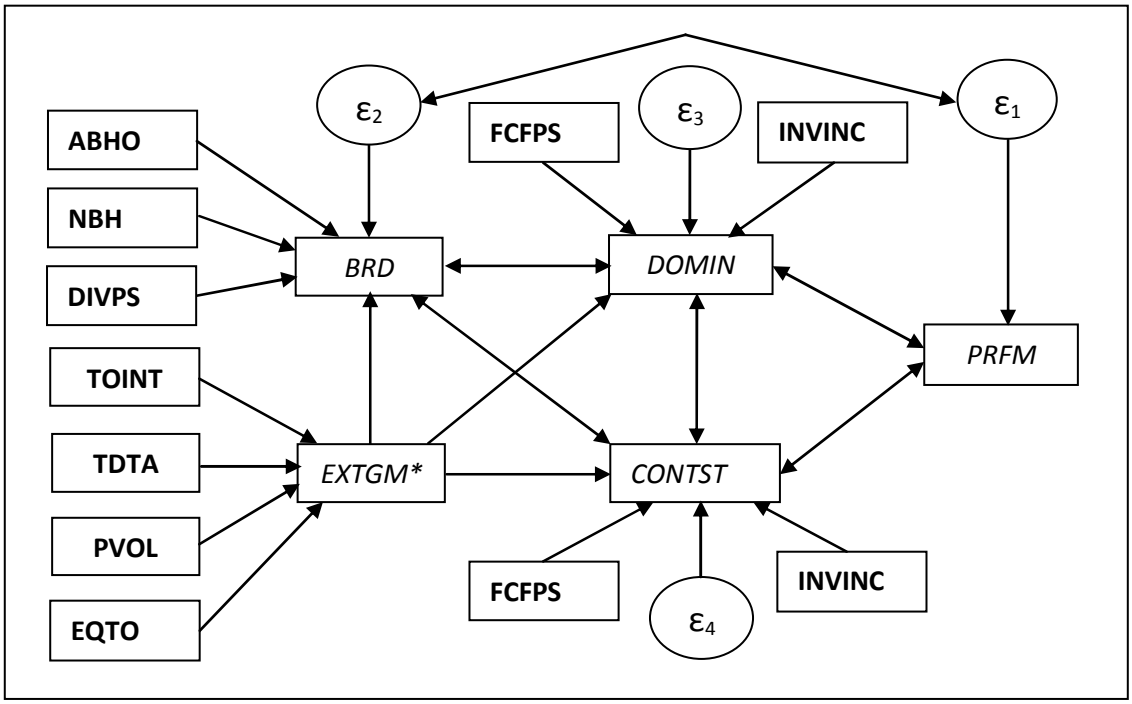
Therefore, the bad signal of SEM is when the parameter is *underidentified*. It is when a parameter *is not uniquely determined by population moments*, that is, when more than one value of the parameter is consistent with a given set of population moments. One cautioning note is that it is more important to ensure the identification of parameters and functions of parameters are identified than that of the SEM. This is because for a given model some parameters may be overidentified while others may be underidentified (Joreskog, 1970; Duncan, 1975).

In our model specification, we have to avoid underidentification of each equation in the SEM. The condition to ensure identification for an equation with an endogenous dependent variable is: there must be at least one predetermined (exogenous) variable, called instrumental variable, which directly affects another explanatory variable but have indirect path to the endogenous dependent variable. Hence, we strive to find instrumental variables (IVs) that would ensure the identification of the model and of each equation in the SEM, especially when we use 2SLS and 3SLS estimation methods that require the specification of IVs. The IVs chosen for our SEM are presented in *figure 5.2*.

We might assume that the decision on and the level of the free cash flow in the firm and the investment in the firm are the factors that create the incentives for private benefits of control in the board of structure thus lead to interaction of the control forces and determine the control power position of the board – DOMIN and CONTST. Hence, in our SEM, we treated free cash flow per share

(FCFPS) and investment increase (INVINC) as instrumental variables for *performance (PRFM) equation.* FCFPS is measured as the ratio of cash earnings (fund from operation) net of capital expenditure and total dividends paid out of the firm to outstanding share at the beginning of a period. It is treated as IV for performance because (1) the availability of FCFPS is driven by the amount of free cash at the disposal of the management, which might in turn be driven by the incentives to dominate or contest control, and (2) the OLS regression of ROA on FCFPS included show insignificant relation and very low coefficient (less than 1). Moreover, INVINC is used as IV for performance equation since (1) it is a relative value, the result of the difference between the previous value and the present divided by the number of outstanding shares of the firm and it can be assumed that it has no relation with the current firm performance, and (2) the OLS regression of ROA on FCFPS included show insignificant relation and very low coefficient (less than 1).

Fig 5.2: A detailed non-recursive path model of the SEM and the instrumental variables



* *Note:* Here, EXTGM also includes other stock market factors, namely stock price volatility (PVOL) and equity turnover (EQTO) that are control variables just for convenience.

Moreover, it is assumed that the level of both FCFPS and INVINC, which is within the discretion of the BRD or management, determine the dominance and contestability of control (DOMIN and CONTST) of the firm directly and board of directors indirectly. The level of FCFPS and INVINC does not drive or determine the set up of the board directly but the dominance and contestability of control within the board. Hence, we also treat FCFPS and INVINC as instrumental variables for *board* On the other hand the aggregate ownership of all blockholders (ABHO), number of blockholders (NBH) and dividend DIVPS directly impact BRD but indirectly influence DOMIN and CONTST. It can be argued that ABHO and NBH in the firm directly determine the formation of the board of directors but do not affect the dominance and contestability of control within the firm once the BRD is set in place by election at the General Meeting. Additionally, DIVPS, which is the ratio of dividend payment to number of outstanding shares of the firm at the beginning of the year, is also the accounting measure that takes place every six months and/ or year. Hence, DIVPS might directly impact the

formation of the BRD but not DOMIN and CONTST once the BRD is set in place. Hence, they ABHO, NBH and DIVPS are treated as instrumental variables for the *DOMIN equation* and *CONTST equation*. Moreover, it is arguable that the voting power of blockholders determines firm performance, whereas NBH might not determine PRFM. Hence, we assume that NBH, which directly impacts board structure, indirectly drives PRFM. Additionally, DIVPS might not directly determine firm performances because it is the ratio to number of shares in the firm that might not have any impact of firm performance. Hence, NBH and DIVPS have indirect path to PRFM. Hence, they can serve as instrumental variables to *PRFM equation*.

Moreover, external corporate governance mechanisms (EXTGM) that are proxied TOINT and DEBTR, and the other stock market factors (PVOL and EQTO) have direct path only to BRD, DOMIN and CONTST and indirect path to PRFM. Hence, they can be IVs only for PRFM equation. They are assumed as predetermined exogenous variables that can serve as instrumental variables in 3SLS. Nevertheless, we use EQTO only in DOMIN and CONTST equations because it is assumed that EQTO is very important factor in the determination of DOMIN and CONTST to the blockholder or their coalitions by giving the option to either accumulating block of shares by purchasing more shares to attain dominance and contestability or to sell own share and exit the firm. Hence, the detailed specification of the SEM, where the endogenous variables are underlined, is as follows.

$$
\begin{cases}
\underline{ROA} = \underline{PNED} + \underline{DUAL} + \underline{DOMIN} + \underline{CONTEST} + PRFM_{t-1} + ABHO + FCFPS + INVINC + TOINTENS + TDTA + PVOL + \varepsilon_1 \\
PNED = \underline{DUAL} + \underline{DOMIN} + \underline{CONTEST} + NHB + DIVPS + ABHO + TOINTENS + TDTA + PVOL + PRFM_{t-1} + FCFPS + DUAL + INVINC + \varepsilon_2 \\
DUAL = \underline{PNED} + \underline{DOMIN} + \underline{CONTEST} + NHB + DIVPS + ABHO + TOINTENS + TDTA + PVOL + PRFM_{t-1} + FCFPS + DUAL + INVINC + \varepsilon_2 \\
DOMIN = \underline{PNED} + \underline{DUAL} + \underline{CONTEST} + FCFPS + INVINC + TOINTENS + TDTA + PVOL + EQTO + DIVPS + NBH + PRFM_{t-1} + \varepsilon_3 \\
CONTST = \underline{PNED} + \underline{DUAL} + \underline{DOMIN} + FCFPS + INVINC + TOINTENS + TDTA + PVOL + EQTO + DIVPS + NBH + PRFM_{t-1} + \varepsilon_4
\end{cases}
$$

Since one condition of identification is that the IVs should at least be equal to the number of the endogenous variables and in our detailed SEM above we have more than one instrumental variable for each dependent variable. Finally, the firm-specific control variables (CTRL) – *TA, AGE, RNDTS, FATS* and *SGATS* - are *strictly exogenous variables,* are assumed to be instrumental variables for the following four different versions of the following SEMs, which have five equations each.

1. *VPC1-VPC2 Model:* (SEM with the voting power of C1 (VPC1) and C2 (VPC2) as dominants and contestants respectively)
2. *TDPI-SHAPV Model:* (The power index of the coalition of the C1C2 (TDPI) and the 'ocean' (SHAPV) as dominants and contestants respectively)
3. *C1C4-C2C3 Model:* (Dominant and contestant coalition – C1C4 and C2C3 respectively).
4. *MONR-CONTR Model:* (Ratios for the monopoly and the contestant coalitions – MONR and CONTST respectively).

5.5.3 Description of Variables

5.5.3.1 Performance variable

The only accounting measure of performance used in the investigation is return on assets (ROA) following Denis and Denis (1994), Maury and Pajuste (2005) and Gutierrez and Pombo (2009). Even though it is cautioned that accounting figures might be manipulated so as to look good when reported, and that the accounting figures are based on historical costs, since they are taken into expectation when investors calculate the price of share values, we still believe that the use of accounting performance variables is useful. The performance variable used as dependent variable and its lag (corresponding values in the previous year), which is used as explanatory variable due to dynamic endogeneity, are presented in *table 5.2* below.

Nevertheless, this research is delimited in its confinement to the use of only ROA. The use of other performance (value) variables such as return on equity (ROE), market-to-book value (MTBV), and price per share (PER) is omitted because of the complexity of the estimation the structural equations that already involved the estimation of 20 equations. Furthermore, it should be noted that the lagged performance variable (ROAt1) are not used as dependent variable but as independent or predictor variable because it usually controls for the reverse causality (Weir et al., 2001) and it can be used to control for persistence in the performance data in terms of accounting data.

Table 5.2: Symbol and description of performance variables and lagged performance variable

Symbol	Variable name	Descriptions and measures
Performance variables : dependent variables and lagged performance variables		
ROA	Return on assets (ROA_t)	Net income over total assets in the current year
ROAt1	Previous ROA (ROA_{t-1})	Return on assets in the previous year

5.5.3.2 Ownership Concentration and Control Variables

There are several ownership concentration variables that measure the dispersion of ownership, the dominant blockholder, the number of all blockholders, controlling coalition and contesting coalitions. Based on the hypotheses development, we have chosen to use only ABHO and NBH to measure ownership concentration. Based on the rationale behind control dominance and contestability factors and their relevant variables used to measure or proxy them discussed in hypothesis formulation, *table 5.3* presents ownership concentration and coalition variables.

As already mentioned, the control variables used in this research include (1) governance mechanisms, including board structures, and (2) firm-specific accounting variables (see *table 5.4* for symbols and descriptions; and *Chapter Three* and *Four* of this Thesis for explanations). The board of directors' variables (discussed in *section 5.3)* includes PNED and DUAL, where as the external governance mechanism and stock market variables include TOINTENS, TDTA, PVOL, and EQTO. Finally, the firm specific variables that have impact on firm performance included in the analysis are *firm size* (total assets, TA); *firm age* (AGE); *R&D to sales ratio* (RNDTS); *sales, general and administration expense (*includes advertisement expenses) *to sales ratio* (SGATS); and *fixed assets to sales ratio* (FATS).

Table 5.3: Definition and descriptions of ownership concentration and possible key coalitions

Symbol	Descriptions and measures
Panel A	**Ownership concentration , number of blockholders, and the first four largest blockholders**
ABHO	Aggregate of all blockholders' ownership.
NBH	The number of blockholders.
C1	Control or voting rights of the first largest blockholder.
C2	Control or voting rights of the second largest blockholder.
C3	Control or voting rights of the third largest blockholder.
C4	Control or voting rights of the fourth largest blockholder.
Panel B	**Control dominance variables**
VPC1	Voting power of the first largest blockholder in the firm.
C1C4	The voting power of the coalition of the first and fourth largest blockholders.
MONR	Monopolizability ratio, it is computed as the ratio of the aggregate voting power of C1 and C4 to the aggregate voting power of all blockholders (= (C1+C4)/ABH)).
TDPI	Total dominant power index of the first two largest blockholders, i.e., TDPI = PI1 + PI2.
Panel C	**Contestability of Control Variables**
VPC2	Voting power of the second largest blockholder in the firm.
C2C3	The voting power of the coalition of the second and the third largest blockholders.
CONTR	Contestability ratio; the ratio of the contesting coalition of C2 and C3; calculated as the voting power of C1+C2 to the voting power of all blockholders (ABHO).
SHAPV	Shapley values; 1-TDPI/ OPH = TPI/ (1-(w1+w2)).

Table 5.4: Summary of the definition and descriptions of control variables

Symbol	Variable name	Descriptions and measures
PNED	NED Representation	Board independence proxy, which is measured as the number of non-executive directors over the number executive directors.
DUAL	CEO-duality	Duality takes the value 1 if the CEO sits on the board as Chairperson, 0 otherwise
TOINTENS	Takeover intensity	The number of firms in the firm's industry acquired during the previous period over the number of firms in that industry sector
TDTA	Debt ratio	Debt financing (leverage ratio), measured as the ratio total debt to total assets of the firm.
PVOL	Price volatility	Stock price volatility, proxied by volatility rating. It is calculated on standard deviation of the price divided mean price and the whole multiplied by 40 to make it in scale 1-20.
EQTO	Equity turnover	The turnover rate of equity of the firm in the capital markets. It is calculated as the ratio of the number of shares transactions annually to the total number of shares outstanding at the beginning of the period.
TA	Firm size	The book value of total assets.
AGE	Firm age	The age of the firm since incorporation.
RNDTS	R&D ratio	Research and development intensity (R&D ratio), which is measured as the ratio of annual R&D expenditure to total assets.
SGATS	Advertisement ratio	Advertisement ratio (AD ratio), which is proxied by the ratio of Selling, General and Administration Expenditures (SGA) less R&D expenditure to total sales.
FATS	Fixed asset ratio	Fixed assets intensity (FA ratio), which is measured as the ratio of total annual expenditures on fixed assets to total sales.

5.5.4 Data Analyses

Analysis of the data regarding data levels, missing values, outliers and normality carried out show similar information as in *section 4.3.3.1.* For further analysis of normality the descriptive statistics with (shown in *table 5.5*) is used. It is indicative that the mean of the voting power of the first largest blockholders, the second largest blockholder, coalition of C1 and C4, coalition of C2 and C3 in UK listed firms are around 16%, 8%, 20%, and 13% on average respectively. However, their median values (p50) are 12%, 7%, 16%, and 12% respectively. This indicates that the voting powers of the blockholders and blockholder coalitions are important control potential variables confirming that they are proper candidates for analysis.

Table 5.5: Descriptive statistics of control dominance and contestability variables

variable	N	p50	mean	sd	skewness	kurtosis
roa	2793	5.35	6.0141	10.281	-1.3057	28.52
vpc1	2656	12.065	15.934	13.022	1.9717	7.4766
vpc2	2656	6.93	8.0056	5.4967	1.9526	10.085
c1c4	2656	16.385	19.595	13.354	1.5252	5.938
c2c3	2656	12.055	13.165	8.1218	1.1682	5.8127
tdpi	2656	.01916	.08347	.19998	3.1114	11.438
shapv	2656	1.1997	1.2125	.27185	.62535	18.351
monr	2655	.48204	.51207	.199	.51054	3.6766
contr	2655	.34553	.34918	.12982	-.19207	3.6066
abho	2656	37.835	39.99	22.25	.38684	2.6838
nbh	2656	5	5.3212	2.7257	.49459	3.2526
pned	2632	.61538	.63746	.19963	.11377	2.8274
dual	2634	0	.25133	.43386	1.1465	2.3146
divps	2798	.082	.14666	.26479	10.633	174.51
fcfps	2569	.029	.05339	.61029	1.9313	78.781
invincr	2375	0	2.3e+05	3.8e+06	32.942	1234.1
tointens	2653	.05682	.06883	.05162	2.1571	9.029
tdta	2824	14.705	19.005	18.481	1.4709	6.9435
pvol	2447	26.55	28.338	10.157	1.0184	4.1968
eqto	2875	.70259	.93996	.91713	4.4226	40.669

As it can be observed in the table, the other indication is that the means of each variable are greater than 1 standard deviation indicating low variances. The skewness and kurtosis statistics show that some of the variables are not normally distributed. The values of skewness and kurtosis are not equal to zero, indicating that they have not bell-shaped distribution even though some are nearly closer to zero indicating assumption of approximate normality. Moreover, the skewness of some variables like TDPI, DIVPS, INVINCR, TOINTENS, and EQTO are higher or lower than rule-of-thumb range of -2 and +2, indicating that the variables are not normally distributed. Their kurtosis also shows the same fact since they are outside the stringent range -3 and +3. However, the kurtosis of many variables that seem normally distributed according to skewness exhibit non-normality. Moreover, the descriptive statistics of the control variables (that are used as instrumental variable) not included in here also show that RNDTS, FATS and SGATS have very high skewness and kurtosis, indicating non-normality.

To sum up, all of control dominance and contestability variables except TDPI are assumed as normally distributed based on the rule-of-thumb on skewness criteria discussed above. The variables not fulfilling the normality criteria would be used without transformation in order to avoid imposing artificial information and since we are using a panel data that can be estimated by methods, which does not require NIID assumptions.

5.5.5 Diagnostic Analyses of OLS Assumptions

We now know from the data analysis that the data exhibits some problems, namely semi-parametric data set, few outliers, and normality of the variables. The diagnostic analyses of OLS assumptions are made as a prelude to the determination of appropriate estimation methods. This is presented in details as *Appendix D.* The diagnostic analyses show that normality of residuals, and independence of residuals are violated, hence NIID assumption for OLS is not fulfilled even though the residuals are identical (no problem of heteroscedasticity).

5.5.6 Estimation Methods

5.5.6.1 Characteristics of the SEM

Based on the discussions in *section 5.5.2* the general equations for the empirical structural model that would be estimated and analysed in our investigation are:

$$\begin{cases} PRFM = BRD + DOMIN + CONTST + EXTGM + CTRL + PRFM_{t-1} + \varepsilon_1 \\ PNED = DOMIN + CONTST + EXTGM + CTRL + PRFM_{t-1} + \varepsilon_2 \\ DUAL = DOMIN + CONTST + EXTGM + CTRL + PRFM_{t-1} + \varepsilon_2 \\ DOMIN = BRD + CONTST + EXTGM + CTRL + PRFM_{t-1} + \varepsilon_3 \\ CONTST = BRD + DOMIN + EXTGM + CTRL + PRFM_{t-1} + \varepsilon_4 \end{cases}$$

The possible characteristics and problems of the system of structural equations model are that (1) there might be non-recursivity in the relationship among the factors in the model; (2) there might raise problems of *contemporaneous correlation of errors* across the equations in the SEM; (3) there might be omitted variables (thus *unobserved heterogeneity*) from the equations of the model, (4) current *observable characteristics or actions* in a firm will affect its control environment and future performances (*dynamic endogeneity*), and (5) some of the right hand side (explanatory) variables are the function of the dependent variable and hence endogenous variables (*simultaneous or joint endogeneity)*.

Non-recursivity of the Model: In determining the methods of estimating the model, we need to consider the relationships among the variables and across the equations. Two characteristics we know from our theoretical and hence empirical model is that (1) there are reciprocal causal relationship between the control factors, and (2) different disturbances (error terms) might not be independent of one-another; in other words, the error terms across equations have *contemporaneous correlation*. Since this fact indicates that that our structural equations model is *non-recursive model, and* since OLS is not an appropriate estimation method, we need to choose other proper estimation methods.

Contemporaneous Correlation: *Contemporaneous correlation* is the correlation between the error terms across the equations in the structural equation model. In our SEM which has a network relationship among different control factors and performance, we assume that the error

terms in the structural equations system, at the same point in time, are correlated. The SEM estimation method that should be applied should take this into account.

Unobserved heterogeneity: *Unobserved heterogeneity* arises if there are unobserved factors or omitted variables that affect *both* the dependent and explanatory variables so that after fitting the model there is still a relationship with the other omitted variables and the residuals. As already mentioned, there are several firm-specific, industry-specific, product markets-specific characteristic factors in the firm's environment that affect firm performance, board structures, and the control dominance and contestability in corporations. Himmelberg et al. (1999) argues that the unobserved heterogeneity in the contracting environment across firms generates a spurious correlation between ownership and firm performance. Hence, since the proxies for DOMIN and CONTEST come from ownership structure (cash flow rights), it might also be suggestive that there are omitted variables that create spurious correlation between them and firm performance. In empirical investigation involving economic issues, it might be quite impossible to explicitly include all such factors. So the existence of the endogeneity caused by omission of variables or unobserved heterogeneity is a common phenomenon. Wintoki et al. (2009) also argues that cross-sectional variation in observed governance structures is driven by *both* unobservable heterogeneity and the firm history.

In the estimation of the SEM with *unobserved heterogeneity*, OLS estimation may be biased and cannot eliminate unobserved heterogeneity, which it completely ignores. Nevertheless, it is suggested in econometric literature that unobserved heterogeneity can be eliminated by using both *fixed-effects* and *instrumental variables (IVs)* estimators. However, fixed-effects regression would be *consistent* only if the current values of the independent variables are completely independent of past dependent variable. Nevertheless, due to the presence of autocorrelation in our panel data and dynamic endogeneity relationships among the variables in the SEM, fixed-effects estimation is not proper since it leads to inconsistent estimators.

Dynamic endogeneity: In our model it is suggested that past performances affect current values of control factors. This *dynamic endogeneity* would also cause *spurious correlation* between the past performance and control factors (especially BRD, DOMIN and CONTEST). The estimation of the model with dynamic endogeneity using fixed-effects regression yields *spurious estimates* of the effect of independent variable on the dependent variable even if there is no causal relation between them. Hence, *dynamic endogeneity* in the model calls for other appropriate methods of estimation. One possible method is the use of *Dynamic panel GMM estimation*, which yields unbiased estimator by eliminating unobserved heterogeneity factors that affect both the dependent and independent variables and some dependent variables that are related to the past dependent variable. However, this GMM estimation method of the structural equations model that accounts for dynamic endogeneity is not handy yet on STATA version used in this study. Nevertheless, regarding the problem, Wintoki et al. (2009) argues that there is a weaker relationship between the explanatory variables and the past dependent variable, and hence dynamic endogeneity is less of a concern in regressions relating governance (control factors) to firm characteristics. Hence, the inclusion of past performance as explanatory variable together with other predictors is not a problem.

Simultaneous or joint endogeneity*: Simultaneity* might lead to endogeneity if the independent variables are function of the dependent variable or expected values of the dependent

variable. This kind of endogeneity is referred to as *simultaneous endogeneity.* Wintoki et al. (2009) argue that simultaneity can arise in the board structure-performance relation from an economic perspective. The implication of this perspective is that firms choose their board structure with a view of achieving a particular target of performance in that period, in which case there will be a reverse causality between board structure and performance and both factors are simultaneously determined (Wintoki et al., 2009). This might be true also for DOMIN and CONTST variables and performance and also BRD variables. This simultaneous determination makes both *OLS* and *fixed-effects* estimates biased. However, we can use structural equations model and estimate it using *IV methods* like *2-stages least squares (2SLS), seemingly unrelated equations (SURE),* or *3-stages least squares (3SLS)* estimators. However, the IV methods require theoretically based powerful instrumental variables in order to account for simultaneity. Another alternative estimation method of non-recursive SEM with simultaneity is the *full information maximum likelihood (FIML)*, which minimizes the determinants of the covariance matrix related to residuals.

5.5.6.2 Appropriate Estimation Methods

Method identification: It is already noted above that *OLS* cannot be appropriate to estimate the non-recursive SEM with endogeneity problems. Additionally, the *fixed-effects estimation* fails to be appropriate since it cannot handle the dynamic endogeneity. Anyhow, the *dynamic panel GMM estimation method* that can account for dynamic endogeneity could not be used even though it provides powerful unbiased and consistent estimates because, as already noted, it is not supported by the STATA version used in the analysis. Hence, the *IV estimation methods* (2SLS, SURE, and 3SLS) and *FIML* would be the possible estimation methods applicable to the SEM characteristics and the nature of our data.

2SLS (*2-stage least squares*) method would not be appropriate estimation method for our SEM since it does not handle contemporaneous correlation across equations and it assumes recursivity of the model. Hence, for our non-recursive SEM with different sources of endogeneity and contemporaneous error correlation across equations and for a medium sample size, the appropriate IV and other estimation methods for the SEM are *SURE, 3SLS,* and *FIML*.

SURE *(seemingly unrelated regression),* which is also called *joint generalized least squares* (JGLS) or Zellner estimation, may improve efficiency of parameter estimates when there is contemporaneous correlation of errors (Zellner 1962, 1963). SURE is a generalization of OLS for multi-equation systems. Like OLS, the SURE method assumes that all the regressors are independent variables, but unlike OLS, SURE uses the correlations among the errors in different equations to improve the regression estimates. Initially, the SURE method requires an initial OLS regression to compute residuals. Then OLS residuals are used to estimate the cross-equation covariance matrix. In SURE estimation INSTRUMENTS and ENDOGENOUS statements are not needed, because the method assumes there are no endogenous regressors.

For SURE to be effective, the models must use different regressors. SURE produces the same results as OLS unless the model contains at least one regressor not used in the other equations. The parameters estimates of SURE will be different from that of OLS under two circumstances: (1) when there is no contemporaneous correlation of errors across equations (the estimate of the contemporaneous correlation matrix is diagonal), and (2) when the independent variables are the

same across equations. SURE would yield more efficient estimates than OLS (1) when the sample is not small, and (2) if the specification error is not serious. In estimating small samples, SURE might be less efficient than OLS because the need to estimate the covariance matrix from OLS residuals increases sampling variability of SURE estimates, thus affecting its efficiency. The consequences of specification error are also more serious with SURE than with OLS. Our data is medium and there seems to be no serious specification error, hence SURE might be appropriate method of estimation if there is no endogeneity problem.

3SLS *(3-stage least squares)* method combines the ideas of 2SLS and SURE methods. Like 2SLS it uses predicted endogenous dependent variable (regressors), which result in consistent estimates. On the other hand, like SURE method, 3SLS takes the cross-equation error correlations into account to improve large sample efficiency. In 3SLS estimation, the 2SLS residuals are used to estimate the cross-equation error covariance matrix. Three-stage least squares estimation requires three steps: (1) first-stage regressions to get predicted values for the endogenous regressors; (2) a *two-stage least squares* step to get residuals to estimate the cross-equation correlation matrix; and (3) the final 3SLS estimation step.

FIML *(full-information maximum likelihood)* estimation method is the final alternative estimation method thought for estimating our SEM with the characteristics described above. *FIML* estimator is a system of generalization of the *little-information maximum likelihood (LIML)* estimator, but it is implemented as an IV method (Hausman, 1975). It involves minimizing the determinants of the covariance matrix associated with residuals of the reduced form of equation system. Like LIML method, FIML involves assuming that errors are normally distributed. FIML maximizes the likelihood function subject to restriction on a particular equation. However, unlike LIML, the likelihood function is maximized subject to restrictions on all of the parameters in the model, not just the equation being estimated.

Cautions in estimating SEM: When estimating SEM using the methods mentioned above, it is vital to take certain factors into account. Firstly, although system methods are *asymptotically most efficient* in the absence of specification error (misspecification), they are *more sensitive to specification error* than single equation methods. Hence, even though models are not perfectly specified in practice, we need to check whether they are identified or not. The second factor to consider and check is *sample size*. With small sample, 2-SLS is preferred to 3-SLS; and with large sample, SUR and 3-SLS are preferable. We should note that SURE is less efficient than OLS in small samples. With an average yearly sample of between 450 and 500, our data fits for SURE and 3SLS.

Thirdly, it is essential to identify the source of *contemporaneous correlation* among errors across equations. If the correlation of errors across equation is from a common omitted variable, it is not best to use SURE since SURE parameter estimates are more sensitive to specification errors than OLS, in which case OLS may produce better parameter estimates than SURE. SURE estimates are also affected by the sampling variation of the error covariance matrix. Hence, in such case, 3SLS remains to be the best alternative. The endogeneity problems in the SEM can be handled by 3SLS that uses instrumental variables and that is why we discussed the identification of instrumental variables previously. Hence, based on the discussions made above, the ideal and most appropriate estimation method we used in our investigation is 3SLS.

5.6. RESULTS AND ANALYSES

5.6.1 Results on the Models

5.6.1.1 Correlation Analysis on VPC1-VPC2 Model

Table 5.16 shows the correlation coefficients of unstandardized residuals from the separate individual OLS (*table 5.16a)* and 3SLS *(table 5.16b)* regression of the endogenous variables on their respective predictors. The significant correlation between the residuals marked by star (*) at 5% significant level show that the pairs are related through their disturbance terms (Gupta, 1983). We can see that 3SLS is more strict in providing evidence on the relationships in the disturbance terms than OLS. Hence, it is indicative that the use of 3SLS is appropriate in estimating the estimators for the SEM since it takes into account the correlation matrix of errors across equations as previously discussed. PNED, DUAL, VPC1 and VPC2 are correlated to the ROA through the disturbance term. It might be argued that the dependent (board structure and control dominance and contestability) variables are endogenous as suggested by researchers and in our theoretical and empirical model.

Table 5.16: Pairwise correlation between the endogenous variables and their residuals

5.16a: Correlation coefficient between OLS unstandardized residuals

	resid	resid2	resid3	resid4	resid5
resid	1.0000				
resid2	-0.5676*	1.0000			
resid3	-0.4515*	0.7487*	1.0000		
resid4	0.0556*	0.0195	0.0679*	1.0000	
resid5	-0.0394	-0.1142*	-0.0491*	0.6479*	1.0000

5.16b. Correlation coefficients between 3SLS unstandardized residuals

	resid3~a	residp~d	residd~l	residv~1	residv~2
resid3roa	1.0000				
residpned	-0.3619*	1.0000			
residdual	-0.4071*	0.3570*	1.0000		
residvpc1	0.1886*	0.1287*	0.0862*	1.0000	
residvpc2	0.1143*	0.0845*	-0.0258	0.6946*	1.0000

Note: *The residuals are for ROA, PNED, DUAL, VPC1 and VPC2 equations in sequence, from OLS and 3SLS regressions.*
** Significant at 5%*

Moreover, it can also be argued that the past performance of the firm might influence the set up of the current board structure and the stakes of the first and the second largest blockholder hence their voting power. This also might confirm the arguments for the theoretical and empirical models in this research. Finally, one interesting observation here is that PNED and DUAL as well as VPC1 and VPC2 are also related through disturbance term having high significant correlation coefficient (0.7487 and 0.6946). Hence, the choice of 3SLS as an estimation method is justified.

5.6.1.2 3SLS Results on VPC1-VPC2 Model

The result of the 3SLS regression of the SEM that assumes the first largest as dominant controllers and the second largest blockholders as contesters is presented as *table 5.17.* The table has five panels showing the 3SLS regression of each equation within the SEM. It can be seen that the R-squared for ROA equation (35.16%) is very low.

Table 5.17: Three-Stage Least Squares Regression of VPC1- VPC2 Model

		VPC1-VPC2		
Equation	**Variable**	**Coef.**	**z**	**P>z**
PRFM-ROA	Pned	12.326	3.53	**0.000**
	Dual	-8.218	-2.66	**0.008**
	vpc1	-0.038	-0.49	0.626
	vpc2	0.694	1.22	0.223
	Abho	-0.100	-1.34	0.182
	Fcfps	0.314	1.00	0.318
	invincr	0.000…	-1.80	**0.073**
	tointens	15.146	3.13	**0.002**
	Tdta	-0.037	-2.13	**0.033**
	Pvol	-0.073	-2.62	**0.009**
	roat1	0.253	8.58	**0.000**
	R-sq.			**0.3516**
BRD-PNED	Dual	0.277	2.70	**0.007**
	vpc1	0.056	4.81	**0.000**
	vpc2	0.101	4.65	**0.000**
	Abho	-0.057	-6.61	**0.000**
	Nbh	0.229	5.95	**0.000**
	Divps	-0.079	-1.89	**0.059**
	Fcfps	-0.006	-0.49	0.626
	Invincr	0.000…	0.65	0.518
	Tointens	-0.504	-1.94	**0.052**
	Tdta	-0.000	-0.03	0.976
	Pvol	-0.002	-1.21	0.224
	roat1	0.005	0.43	0.669
	R-sq.			**0.7448**
BRD-DUAL	Pned	1.094	33.85	**0.000**
	vpc1	0.006	4.21	**0.000**
	vpc2	-0.011	-2.87	**0.004**
	Divps	-0.153	-6.02	**0.000**
	Fcfps	-0.015	-1.22	0.221
	Invincr	-0.000…	-2.20	**0.028**
	Tointens	-0.634	-4.27	**0.000**
	Tdta	-0.005	-10.57	**0.000**
	Pvol	-0.009	-11.63	**0.000**
	roat1	-0.005	-5.47	**0.000**
	R-sq.			**0.5976**
DOMIN-VPC1	Pned	26.095	3.66	**0.000**
	Dual	-12.910	-2.11	**0.035**
	vpc2	-1.309	-2.39	**0.017**
	Abho	0.914	7.97	**0.000**
	Nbh	-3.935	-16.22	**0.000**
	Divps	-0.269	-0.24	0.811
	Fcfps	0.029	0.12	0.907
	Invincr	-0.000…	-0.96	0.335
	Tointens	6.469	1.57	0.117
	Tdta	-0.033	-1.24	0.214
	Pvol	-0.029	-0.59	0.552
	Eqto	-0.913	-2.02	**0.043**
	roat1	-0.031	-1.03	0.302
	R-sq.			**0.8917**
CONTEST-VPC2	Pned	18.450	2.34	**0.019**
	Dual	-9.137	-1.75	**0.081**
	vpc1	-0.695	-2.44	**0.015**
	Abho	0.654	3.58	**0.000**
	Nbh	-2.773	-2.86	**0.004**
	Divps	-0.133	-0.16	0.872
	Fcfps	0.019	0.11	0.914
	Invincr	-0.000…	-0.93	0.351
	Tointens	4.306	1.11	0.266
	Tdta	-0.023	-1.12	0.263
	Pvol	-0.019	-0.51	0.608
	Eqto	-0.631	-1.48	0.139
	roat1	-0.023	-1.14	0.253
	R-sq.			**0.7512**

Performance (PRFM-ROA) Equation: The 3SLS estimators show that there is significant evidence to believe that the board structure (PNED, DUAL), INVINCR, and the external governance mechanism (TOINTENS and TDTA), PVOL and past performance are determinants of current firm performance. The proportion of non-executive directors (PNED) shows a significant positive

influence on ROA; and CEO-duality (DUAL) has a significant negative influence on ROA at 1% significance level (α). This supports the rationale behind the UK Code of Best Practice.

On the other hand, we cannot be confident to conclude that the first and the second largest blockholders (VPC1 and VPC2) enhance and reduce firm performance respectively. This might be interpreted by the possibility of monitoring by the second largest blockholders or the high investor protection in the UK corporations that might induce VPC1 to enhance shareholders' value. The ownership concentration, measured as the aggregate holding of all significant blockholders (ABHO), has insignificant negative relationship with ROA. The result is consistent with the suggestion of Demsetz and Lehn (1985) that there is no systematic effect of ownership concentration on firm performance. Free cash flow per share (FCFPS) which is considered in the agency theory to be the source of agency costs (Easterbrook, 1984; Rozeff, 1982; Jensen, 1986) has not any significant influence on firm performance. The surprising result is that the increase in investment is found to have a negative significant impact on firm performance (ROA) since a positive effect is expected.

Board Independence (BRD-PNED) Equation: As it can be observed in *table 5.17*, the proportion of non-executive directors is impacted by CEO-Chair-duality, the voting power of the first and the second largest shareholders (VPC1 and VPC2), ownership concentration measured as the aggregate stake of all blockholders (ABHO), and the number of blockholders (NBH) at 1% α. This result is as expected. The fact that CEO-duality, VPC1 and VPC2 impact PNED positively might confirm that board structure or board independence is the bargaining process between the existing CEO and the board as suggested by Hermalin and Weisbach (1998). DUAL is found to have a positive influence on PNED at 1% α. This might also confirm the *bargaining theory of board structure* suggested by Hermalin and Weisbach (1998). It might be suggestive that as duality increases, due to the bargaining process between CEO and the board, more non-executive board members will be elected or represented. The same argument can be made regarding the positive significant relation between NBH and PNED.

Moreover, the result shows that ownership concentration (ABHO) has a negative influence on PNED, suggesting that as the aggregate voting power increases the proportion of external directors will decrease. The insight that might be suggested is that as the voting concentration increases due to the bargaining process, more and more non-independent directors will be elected due to the ensuing struggle for control between the significant blockholders that might strive hard to ensure their representation in the board. Another interesting result is that as the number of blockholders (NBH) increases the proportion of nonexecutive directors increases. We would suggest that this might make sense because the dispersion of blockholders (rise in NBH) that have the incentive and the power to exert control pressure over their firm might enhance board independence. It might follow that if power is concentrated among the very few significant blockholders, the board might be dominated by non-independent directors.

Furthermore, the result of negative relation of dividend per share (DIVPS) or takeover market (TOINTENS) and PNED, at 10% α is difficult to explain. However, we might suggest that as takeover intensity increases, contestability by the incumbent management in the firm increases, and that might lead to the takeover defence in which the controlling blockholders and or managers might acquire and accumulate more share for private benefits of control. Hence, the increase in the voting power concentration might lead to the balance of control power that might lead to lower PNED.

Based on the result showing that TOINTENS has positive impact on ROA in PRFM-ROA Equation where TOINTENS has negative relation with PNED in the BRD-PNED equation might indicate that takeoverhas the substitution effect on PNED (Walsh and Seward (1990).

Finally, the result shows that the other external governance mechanisms, debt financing, previous performance of the firm (ROA_{t-1}) and market price volatility of stocks show no significant association with PNED. Even though the result of the estimators on previous performance might not be efficient, 3SLS's capability to handle correlation of errors across equation might ensure the validity of the results.

Board Leadership (BRD-DUAL) Equation: The results of the board leadership equation show that PNED affect DUAL positively at 1% α, implying that the rise in PNED enhances CEO-Duality. There is no theoretical or empirical rationale that enables us to interpret this result. Anyhow, it is arguable that CEO-duality might unite the board leadership and enhance good decision that might in turn lead to better performance (Finkelstein and D'Aveni, 1994), and this might be favoured in UK listed firms. Moreover, the result also shows that the voting power of the first and second largest shareholders have significant positive and negative association respectively with DUAL at 1% α. It might be suggested that the first largest blockholders might prefer and thus enhance CEO-duality in order to dominate the control within firms, whereas the second largest blockholders, as contestants, would deter CEO-duality in order to check dominance in control. This might suggest the empirical relevance of the control dominance-contestability hypothesis.

Furthermore, the result show that with the exception to free cash flow per share (FCFPS) all the remaining control variables in the equation (DIVPS, INVINCR, TOINTENS, TDTA, PVOL, and ROA_{t-1}) have significant *negative* association with DUAL at 1% α (except INVINCR, which is significant at 5%). From the result, it might be suggestive that the *negative* impact of the external governance mechanisms (TOINTENS and TDTA) on DUAL might imply the substitution effects of the EXTGM on PNED (that has *positively* impact on DUAL) as suggested by Walsh and Seward (1990). The negative impact of past performance, INVINCR and DIVPS on board leadership variable (DUAL) is counterintuitive theoretically or economically.

Control Dominance (DOMIN-VPC1) Equation: *Panel 4* of the 3SLS regression presented as *table 5.17* shows that PNED has a positive significant impact on VPC1 at 1% α. The result is not as expected since PNED is expected to ensure board independence and enhance the monitoring function of the board according to the agency theory (Fama and Jensen, 1983) and the UK Code of Best Practice.

Moreover, the result shows that blockholder concentration (NBH) and ownership concentration (ABHO) have *negative* and *positive* association respectively with VPC1 at 1% α. The economic rationale is that as the concentration of significant blockholders decreases (NBH increases) there are more blockholders that might participate in the control contests, which might enhance monitoring and counter-check the control dominance of the first largest blockholder. On the other hand, the significant *positive* association between ABHO and VPC1 says that the control power or dominance of the first largest blockholder will increase as the ownership concentration (ABHO) increases. The more the share stakes of the firm are held by the few significant blockholders, the more it will tend to empower or ensure the control dominance of the first largest shareholder.

Moreover, CEO-duality and the second largest blockholder (VPC2) have *negative* association with VPC1 at 5% α. The result of the negative impact of the presence of CEO-Duality on the control dominance by the first largest shareholder is difficult to support with theoretical or empirical rationale. However, it might be suggested that in firms with CEO-Duality, the control power of the first largest blockholder is curbed by the CEO that dominates the board.

Finally, the result shows that the main EXTGM variables and ROA $_{t-1}$ show no significant relationship with VPC1. This might be explained by the indirect causal relationship between the variables and VPC1. However, equity turnover has a negative significant impact on VPC1 at 5% α. The negative relation might suggest that as EQTO increases, the first largest blockholder dominance position will decline because (1) other blockholders might buy more shares and raise their voting power that enable them contest the position of the first largest blockholder, and/ or (2) the controlling first largest blockholder might sell own shares to benefit from the wealth gain or reduce own holding and spread stakes across other firms for diversification.

Control Contestability (CONTST-VPC2) Equation: The results in *panel 5* of 3SLS regression in *table 5.17* show that CEO-duality, VPC1, and NBH have *negative* significant association with VPC2 at 10%, 5%, and 1% α respectively. This might suggest the validity of the *dominance-contestability hypothesis.* The result might suggest that in the presence of CEO-duality, the increase in the voting power of the first largest blockholders (VPC1), and the increase in the number of blockholders (NBH) might have an inverse relationship with the contests by the second largest blockholder. Economically this makes sense since (1) when CEO unifies and holds the leadership of the board, the ability to contest by the second largest blockholder will diminish; (2) as the control power of the first largest blockholder increases, VPC2 will decrease; and (3) as there are more number of significant blockholders in the firm, the ability of the second largest blockholder to exert control or contesting pressure will diminish.

Moreover, PNED and ABHO exhibit *positive* significant relationship with the contestability of control, proxied by VPC2, at 1% and 5% α respectively. The economic (theoretical) interpretation suggested by the result might be that (1) as the proportion of nonexecutive directors increases, the ability of the second largest blockholder to exert contesting pressure will increase as expected; and (2) the increase in ABHO will positively impact VPC2 indirectly by enhancing the presence of more number of blockholders (NBH) in the firm that would enhance the struggle for control of the firm.

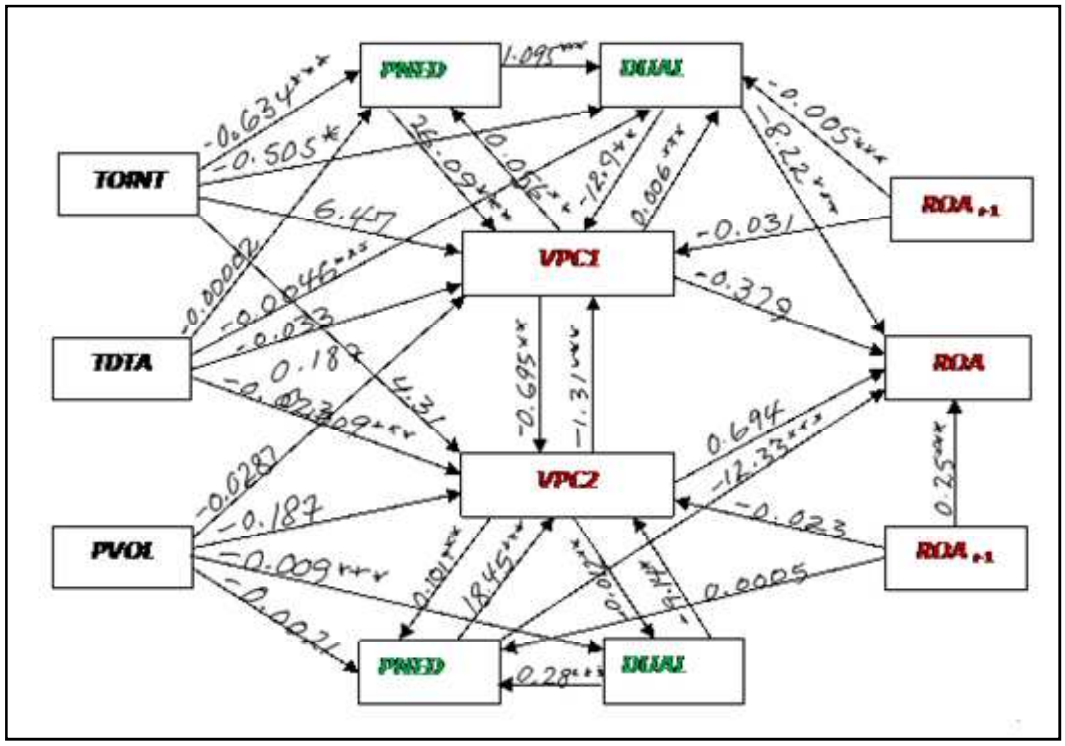
5.6.1.3 Control Balance in the Feedback Loop of VPC1-VPC2 Model

VPC1🡐🡒VPC2: *Figure 5.7* presents the pattern of relationship between the variables with feedback loop. Real contestability of control comes in to the picture when we consider the relationship between the first largest blockholder (assumed to be dominant), VPC1, and the contesting second largest blockholder (VPC2). As observed in DOMIN-VPC1 equation, the significant *negative* impact of VPC2 (with $\beta_2 = -1.31$) on VPC1 at 5% α might reveal that the second largest blockholder contests the power of the first largest blockholder by monitoring and checking the conducts of the first largest shareholder. However, according to CONTST-VPC2 equation, there is significant *negative* effect of VPC1 (with $\beta_1=-0.695$) on VPC2 at the same significance level. Comparison of the two *β*s can indicate that the *negative impact* of VPC2 measured by its coefficient ($\beta_2=1.31$) is greater than that of VPC1 ($\beta_1=0.695$). Hence, we suggest that the control power of the

contestant (VPC2) is greater in the SEM and that control power of the first largest blockholder might be contested by the second largest blockholder. This might also explain why both VPC1 and VPC2 have no significant association with firm performance in *panel 1* of *table 5.17*.

PNED←→VPC1: In BRD-PNED equation, VPC1 has a significantly *positive* relationship (*β=0.056)* with PNED at 1% α. In DOMIN-VPC1 equation, PNED show significant *positive* impact (*β=26.095),* on VPC1 at 1% α. Hence, the impact of PNED on VPC1 is greater than the impact of VPC1 on PNED. This might suggest that as the proportion of NEDs in the board increases, the dominance by the first largest blockholder (C1) will be enhanced.

Fig.5.7: Three-Stage Least Squares Regression of VPC1-VPC2 Model



Note: Own manual construction from table 5.17.

DUAL←→VPC1: The 3SLS result shows that the *negative* impact of CEO-duality on the control dominance (VPC1) (12.9 at 5% significance); and that the *positive* impact of VPC1 on CEO-duality (0.0006 at 1% significance). Considering that the feedback loop relations are significant and ignoring the slight difference in the significance levels, we conclude that the negative impact of DUAL on VPC1 is greater; and hence, in the presence of CEO-duality, the dominance of the first largest blockholder will diminish in the equilibrium.

PNED←→VPC2: The 3SLS result shows the proportion of nonexecutive directors has a significant positive impact (18.45 at 5% α) on the contestability variable of VPC2. In another equation of the structural system, the reversal effect of VPC2 on PNED is 0.101 at 1% α. Comparing the two effects we can see that the effect of PNED is greater than that of VPC2. Hence, we conclude that in the equilibrium, the increase in the proportion of nonexecutive directors might decrease the necessity of contestability.

DUAL←→VPC2: At 10% α, CEO-duality has *a negative* impact (9.14) on the contestability by the second largest blockholder (VPC2). The reversal relation is that VPC2 has a *negative* significant impact of 0.12 on DUAL at 5% α in another equation. This shows that the dominance variable DUALand the contestability variable VPC2 *negatively* affect each other. However, comparison of the magnitude of the effects in indicate that the effect of DUAL on VPC2 is greater than the reverse impact and that when there is CEO-duality, the contesting power or ability of the second largest blockholder will diminish.

DUAL ←→ PNED: The recursive relationship between DUAL and PNED shows that the magnitude of the *positive* impact of DUAL on PNED (0.227 at 1%α), and the *positive* effect of PNED (1.095 at 1%α) on DUAL. The impact of PNED on DUAL is greater than the reciprocal effect of DUAL on PNED. The evidence might suggest that the rise in the proportion of nonexecutive directors might have the impact of enhancing CEO-duality in the UK firms.

5.6.2 Coalitions of the 'First-Two' and the 'Ocean'

5.6.2.1 3SLS Results on the TDPI-SHAPV Model

Performance (PRFM-ROA) Equation: According to 3SLS results (*table 5.18)* on the equation, the total power index of the first two blockholders that are assumed to be dominants (TDPI) and the power index of the 'ocean', measured as Shapley value (SHAPV), which are assumed to be contestants have *positive* significant relationship with ROA at 1% α. Their same positive impact on ROA might mean that if only the first 2 largest shareholders form coalition and try to dominate firm decisions, the rest of the blockholders might contest by exerting their monitoring, which might lead to a check-and-balance and enhance firm performance in the equilibrium. It might be suggestive that dominance and contestability of control in the UK listed firms by blockholder control forces is characterized by the formation of coalitions rather than by single blockholders to significantly impact firm performance.

The interesting result is that both board structures used (PNED and DUAL) show negative *insignificant* relationship with ROA unlike when the first largest and the second largest shareholders are used in VPC1-VPC2 Model. This might be sensible because when the first two largest blockholders make coalition for control, they might dominate the board in firm decisions. Ownership concentration measured (ABHO) has *negative* significant association with ROA at 1% α. Even though this result is in line with the second-order agency theory where multiple large shareholders will extract or divert rent for private benefits of control and appropriate minority shareholders, it is difficult to conclude that ABHO really has negative impact on firm performance for the UK listed firms since (1) the premise of endogenous determination of ownership structure depicts that ABHO has no systematic relation with performance (Demsetz, 1983; Demsetz and Lehn, 1985), and (2) investor protection is very high in the UK,.

Table 5.18: Three-Stage Least Squares Regression of TDPI-SHAPV Model

		TDPI-SHAPV		
Equation	**Variable**	**Coef.**	**z**	**P>z**
PRFM-ROA	Pned	-12.346	-1.33	0.182
	Dual	-2.128	-0.59	0.558
	Tdpi	6.528	2.70	**0.007**
	Shapv	16.954	3.12	**0.002**
	Abho	-0.088	-2.90	**0.004**
	Fcfps	0.292	0.90	0.370
	Invincr	-0.000...	-1.34	0.182
	Tointens	4.638	0.94	0.348
	Tdta	-0.037	-2.18	**0.029**
	Pvol	-0.135	-3.82	**0.000**
	roat1	0.234	9.08	**0.000**
	R-sq.			**0.2968**
BRD-PNED	Dual	0.275	5.83	**0.000**
	Tdpi	0.964	2.34	**0.019**
	Shapv	0.603	11.28	**0.000**
	Abho	-0.010	-2.91	**0.004**
	Nbh	0.042	1.98	**0.047**
	Divps	-0.026	-1.18	0.240
	Fcfps	-0.001	-0.17	0.864
	Invincr	0.000...	0.80	0.426
	Tointens	-0.475	-3.32	**0.001**
	Tdta	-0.000	-0.05	0.962
	Pvol	-0.001	-1.25	0.212
	roat1	-0.000	-0.66	0.508
	R-sq.			**0.9246**
BRD-DUAL	Pned	1.415	13.20	**0.000**
	tdpi	0.236	4.05	**0.002**
	Shapv	-0.268	-3.04	**0.000**
	Divps	-0.118	-4.01	**0.000**
	Fcfps	-0.013	-1.04	0.297
	Invincr	-0.000...	-2.16	**0.031**
	Tointens	-0.424	-2.55	**0.011**
	Tdta	-0.004	-8.59	**0.000**
	Pvol	-0.006	-5.02	**0.000**
	roat1	-0.004	-4.36	**0.000**
	R-sq.			**0.5649**
DOMIN-TDPI	Pned	0.981	2.20	**0.028**
	Dual	-0.509	-2.02	**0.043**
	Shapv	-0.335	-1.79	**0.073**
	Abho	0.009	14.00	**0.000**
	Nbh	-0.049	-15.67	**0.000**
	Divps	-0.095	-1.53	0.126
	Fcfps	-0.002	-0.25	0.801
	Invincr	-0.000...	-0.99	0.322
	Tointens	0.238	1.93	**0.053**
	Tdta	-0.001	-1.43	0.153
	Pvol	-0.002	-1.58	0.115
	Eqto	-0.032	-1.90	**0.058**
	roat1	-0.000	-0.87	0.386
	R-sq.			**0.1153**
CONTEST-SHAPV	Pned	2.833	4.00	**0.000**
	Dual	-1.451	-2.48	**0.013**
	Tdpi	-2.634	-1.77	**0.076**
	Abho	0.025	2.03	**0.043**
	Nbh	-0.129	-1.66	0.197
	Divps	-0.130	-1.13	0.259
	Fcfps	-0.006	-0.27	0.785
	Invincr	-0.000...	-1.08	0.282
	Tointens	0.648	1.53	0.127
	Tdta	-0.004	-1.53	0.125
	Pvol	-0.006	-1.02	0.308
	Eqto	-0.090	-2.08	**0.038**
	roat1	-0.002	-0.96	0.336
	R-sq.			**0.8017**

The result also shows that takeover market has positive significant influence on ROA, whereas TDTA and PVOL show significant *negative* relationship with ROA, at 5% and 1% α respectively. This evidence is the same as in the previous 3SLS regression of VPC1-VPC2 Model. For the lagged performance, we also find the same result except that there is difference in their coefficients.

Board Independence (BRD-PNED) Equation: The result shows that CEO-duality has *positive* significant relationship with PNED at 1% α as in *subsection 5.6.1*. So the same explanation applies to this evidence. In conformity with the results in *table 5.17,* TDPI and SHAPV also have significant *positive* impact on PNED at 5% and 1% α respectively. This makes sense since their voice is crucial in deciding the number of NEDs in the board other than hiring executive management that join the board.

Furthermore, the results show that ABHO and NBH have negative impact on PNED at 1% α and positive association with PNED at 5% α respectively. These results are almost the same as in *table 5.17.* Finally, all the remaining variables (except DIVPS) that have significant impact on PNED in the previous subsection retained significance in this subsection.

Board Leadership (BRD-DUAL) Equation: The result shows that all of the variables except FCFPS are determinants of unified board leadership (CEO-duality) at 1% α except for INVINCR and TOINTENS that are significant at 5% confidence level. The evidence is almost exactly similar to that of the 3SLS regression of VPC1-VPC2 model (*table 5.17*). Hence, the interpretation of the results made in the previous section holds also here. This can be evidence of stability in the SEM.

The coalition of the first two largest blockholders has a significant *positive* impact on CEO-duality at 1% α. That implies CEO-duality will increase as the voting power index of coalition increases. This might suggest that when the coalition of the first largest blockholders (TDPI) dominates the firm's decision process, there is the more likelihood and possibility that the position of CEO and the Chair are held by the CEO in order to exert dominance in control. However, the SHAPV, which measures the power index of the remaining significant blockholders, is found to have a significant *negative* impact on CEO-duality. The result might economically or theoretically suggest that as the power of the significant blockholders out of the dominant coalition increases, there is a tendency for them to push the leadership of the board to *independent leadership*, where CEO-duality diminishes.

Control Dominance (DOMIN-TDPI) Equation: The 3SLS regression results (*panel 4 of table 5.18*) for the equation are also nearly similar to the results of the control dominance equation in the previous section with the few exceptions. The variables PNED, DUAL, SHAPV, ABHO, NBH, and EQTO again show significant impact on the dominance variable TDPI. It is only TOINTENS, which is not significant when the predicted variable is VPC1, that now show significant relation with TDPI. The remaining variables – DIVPS, FCFPS, INVINCR, TDTA, PVOL, and lagged performance (ROA_{t-1}) remain insignificant, thus indicating the stability in the SEM.

The result again confirms the contestability of control when we consider the *negative* significant impact of the contestant variable, SHAPV, at 10%α on TDPI. Remember that VPC2 also has a *negative* impact on VPC1, thus indicating the fair stability of the SEM. The economic or theoretical explanation might be that those not in the coalition of the 'First-Two' will contest the power of the coalition of the first two largest blockholders.

It can be seen from the result that PNED still has significant *positive* impact on dominant TDPI at 5%α. The economic or theoretical rationale might be that with the higher level of the PNED, control of the firm decision process might be dominated by the coalition of the first two blockholders for the UK listed firms. This might be possible in the UK since there is investor protection and the coalition

might make decisions in favour of all shareholders for the shared benefits of control as evidenced with the *positive* impact of TPDI on ROA at 1%α.

Moreover, the board leadership variable (DUAL) still retains *negative* association with TDPI at 5% α and the magnitude of the effect has decreased from 12.9 to 0.51. The statistical interpretation is that the dominance power of the coalition of the first two largest blockholders will diminish, in the presence of CEO-duality. This makes sense theoretically since CEO-duality gives the CEO the means to dominate the decision processes of the board by unifying the board leadership and to probably curb any effort of the contestant.

Furthermore, the result shows that the two concentration variables used (ABHO and NBH) have significant positive and negative impact on TDPI at 1%α respectively. The *positive* impact of ownership concentration (ABHO) on TDPI might reveal that as the stake of all blockholders increases, the dominating power of the first two largest blockholders (TDPI) will also increase. This might be due to the fact that the advantage the coalition of the first two largest blockholders might have from the increase in the number or the decrease in the power of blockholders in the 'ocean' that makes them scattered players; and hence lower contestability as (ABHO) increases. It might also imply that with the increase in ABHO, more stakes of the firm are held by few significant blockholders, which might ensure the domination by the coalition of the 'First-Two'. On the other hand, the result indicates that NBH has *negative* significant impact on TDPI. The economic or theoretical reason might be that as the concentration of the blockholders (NBH) increases, the participation of more blockholders in control contests might enhance the monitoring role and reduce the dominance of the coalition of the 'First-Two'.

TOINTENS and EQTO show *positive* and *negative* impact on TDPI respectively at 10%α. This might suggest that with the increase of takeover intensity, the control of the coalition of the two largest blockholders will increase due to the control pressure to contest any takeover offer by increasing their stakes, management buy-out, or any other defence mechanism. As for the *negative* association EQTO with TDPI, it might be suggested that the power of the coalition (TDPI) declines with the increase in equity turnover because higher equity turnover might enable the contestants in the 'ocean' to buy more shares and increase their control power, and/ or the high EQTO may tempt the coalition to sell the shares to benefit from wealth effect or diversification.

Control Contestability (CONTST-SHAPV) Equation: The result of the 3SLS regression of contestability equation shows that again PNED, DUAL, TDPI, ABHO, and NBH have statistically significant impacts on the power of the 'ocean' (SHAPV). The result is almost similar to the equation where VPC2 contests against VPC1 (see *table 5.17*). Overall, the result indicates that there is stability in the SEM.

The result showing that TDPI has a significant *negative* impact on the power of the 'ocean' (SHAPV) at 10% α is as expected since the increase in the power of the coalition of the first two blockholders must decrease the power of the 'ocean'. Moreover, the result shows that CEO-duality has significant *negative* relation with SHAPV at 5%α. This implies statistically that in the presence of CEO-duality the contending power of the 'ocean' tends to diminish. However, the PNED has significant *positive* impact on SHAPV at 1%α as expected.

ABHO and NBH show positive and negative impact on SHAPV as in the previous model except the drop in the level of significance. The enhancement of contestability (SHAPV) as ABHO increase might be from the indirect impact of resulting decrease in the number of blockholders that might in turn enhance the contest for control against the controlling coalition thus increasing the power of the 'ocean'. The *negative* impact of the number of blockholders (NBH) on SHAPV might suggest that the voting power of contestants decrease due to ownership dispersion or the difficulty in coordinating collective action as the number of blockholders increase.

TDTA and PVOL show insignificant *negative* relationship with SHAPV, whereas TOINTENS show *positive* insignificant relation with SHAPV. However, equity turnover has *negative* relationship with the power of the 'ocean' at 5%α. This implies that as EQTO rises, there can be more trading volumes in circulation and the controlling coalition might buy and lock-in their power of control, thus impacting the decrease in the power of the 'ocean'.

5.6.2.2 Control Balance in the Feedback Loop of the TDPI-SHAPV Model

TDPI ←→ SHAPV: *Figure 5.8* shows the feedback relationship between TDPI and SHAP and others. The *negative* magnitude of effect of TDPI on SHAPV is 2.63 (at 10%α), while that of SHAPV on TDPI is 0.33 (at 10%α). Comparison of the magnitude effect, we might suggest that the coalition of the 'First-Two' has more impact on the 'ocean' than the reverse direction of causality, thus, implying that there is less contestability when the first two blockholders form a control coalition.

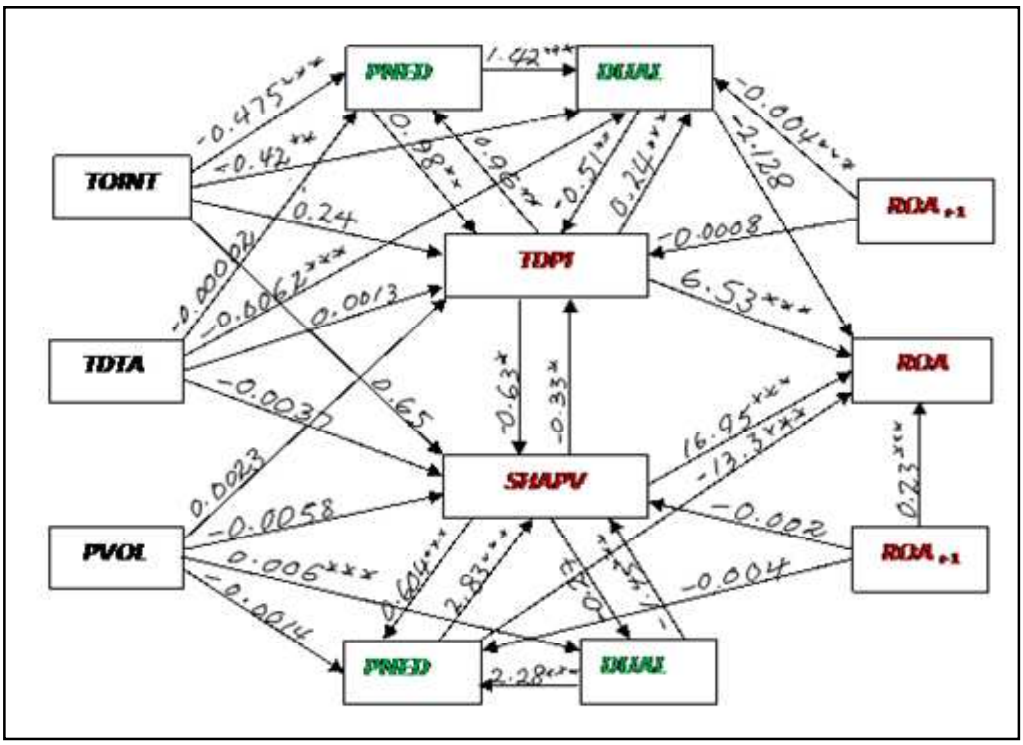
This result is different in the previous section SEM, where the effect of the contestant (the second largest blockholder) is greater than the first largest blockholder. Since the models are quite different and have different assumptions of control, we still believe that control is always contestable from the significant negative relationship in the feedback loop.

TDPI ←→ PNED: The result show that TDPI has a *positive* significant effect of magnitude equal to 0.96 at 5%α on PNED, while PNED has a *positive* significant effect of magnitude equal to 0.98 at 5%α on TDPI. Comparison of the magnitude of effects would suggest that the effect of the proportion of nonexecutive directors (PNED) is greater slightly. This might imply that as the proportion of nonexecutive directors in the UK listed firms increase, there might be an increase in dominance power of the coalition (TDPI) in order to maintain counter-balance in control.

TDPI ←→ DUAL: The magnitude of the *positive* effect of TDPI on DUAL measured by its coefficient is 0.24 at 1%α, while the *negative* impact of DUAL on TDPI is 0.51 at 5%α. Comparison of the two effects, it is conclusive that *negative* impact of CEO-duality on the dominance power of the coalition of the first two largest blockholders is greater in spite of the difference in the α level. Hence, it is suggestive that in the presence of CEO-duality, the dominance by the coalition of the first two largest blockholders will diminish.

SHAPV ←→ PNED: In the feedback loop, the magnitude of the *positive* effect of the power of the 'ocean' (SHAPV) on the proportion of nonexecutive directors (PNED) is 0.604 at 1%α, while the *positive* impact of PNED on SHAP is 2.83 at 1%α. The greater magnitude effect of PNED than SHAPV is consistent with the first model previously discussed in *subsection 5.6.1*. Hence, as the proportion of nonexecutive directors in the board increases, the necessity of contestability of control might diminish and this supports the principles set in the UK Code of Best Practice.

Fig. 5.8 Three-Stage Least Squares Regression of TDPI-SHAPV Model



Note: Own manual construction from table 5.18.

SHAPV ←→ DUAL: The magnitude of *negative* effect of SHAPV on DUAL is 0.27 at 1%α, whereas the *negative* influence of DUAL on SHAPV is 1.45 at 5%α. The greater impact of SHAPV on DUAL might imply that in case there is a coalition of the first 2 largest blockholder, the contestability power of the 'ocean' counter-balances the presence of CEO-duality. Hence in the UK firms the 'ocean' has more control position than CEO-duality. Remember that that this result is different when VPC1 and VPC2 are assumed as dominants and contestants.

DUAL ←→ PNED: According to the result of 3SLS regression the magnitude of the *positive* impact of DUAL on PNED at 1%α is 0.276, while the *positive* effect of PNED on DUAL at 1%α is 1.42. The greater impact of PNED on DUAL than the reversal effect of DUAL on PNED might suggest that in the UK firms the increase in the NEDs might have the impact of enhancing CEO-duality when the first two largest blockholders form coalition of control. The fact that the same result is found in the other previous model is another indicator of the stability of the SEM.

5.6.3 Monopolizing and Contesting Coalitions: C1C4-C2C3

5.6.3.1 3SLS Results on the C1C4-C2C3 Model

Performance (PRFM-ROA) Equation: *Table 5.19* presents the 3SLS regression of the C1C4-C2C3 model. The results show that both C1C4 and C2C3 have *insignificant relationship* with firm performance unlike the result in *section 5.6.2* but similar to that of *section 5.6.1.*

According to the setting of this version of the model, the first and the second blockholders are still in the same control position as in *section 5.6.1* except that they collude with another blockholder. Hence, the insight might be that in the UK firms, the potential coalition for control dominance (C1C4) formed to monopolize control, and the potential coalition for contest (C2C3) formed to exert monitoring pressure might not enhance firm performance. This might arise from the high agency costs of rent extractions by C1C4 and monitoring costs incurred by C2C3. It might be suggested that when the benefits for C1C4 equals the monitoring costs incurred by C2C3, the firm has zero profit in the equilibrium. Hence, when the powers of the two coalitions counter-balance each other, it might be suggested that the board of directors might be efficient to actively allow participation in the decision process that might favour all shareholders.

Supplement to the results discussed above is the impact of PNED and DUAL on firm performance. When such coalitions are used instead of TDPI and SHAPV used in *section 5.6.2*, the board structure variables that shows insignificant effect on the performance turn out to be *significant*. Similar to the results in *section 5.6.1,* PNED show *positive* significant relation with ROA at 1%α, whereas DUAL shows *negative* impact on ROA at 1%α. The insight is that when there are coalitions of dominance and contestants in the firm at the same time, the independent directors and non-unified board leadership might play significant roles in enhancing or reducing firm performance due to the counter-balancing of the two control forces that gives the board members in the periphery to participate actively in the decision process in the UK listed firms.

The 3SLS result also show that INVINCR, TOINTENS, TDTA, and PVOL and lagged performance variable are determinants of firm performance. TOINTENS has *positive* significant effect on ROA at 1%α, while TDTA and PVOL have *negative* impact on ROA at 5 and 1%α-level respectively. Past performance has again *positive* impact at 1%α as in model versions used in *sections 5.6.1* and *5.6.2*, thus, confirming the stability in the SEM. Finally, ABHO and FCFPS remained to be insignificant in this version of the SEM as in *section 5.6.1*.

Table 5.19: Three-Stage Least Squares Regression of C1C4- C2C3 Model

		C1C4-C2C3		
Equation	**Variable**	**Coef.**	**z**	**P>z**
PRFM-ROA	Pned	14.654	3.86	**0.000**
	Dual	-10.338	-3.47	**0.001**
	c1c4	0.052	1.15	0.251
	c2c3	0.064	0.13	0.897
	Abho	-0.033	-0.27	0.791
	Fcfps	0.299	0.96	0.336
	Invincr	-0.000...	-2.00	**0.046**
	Tointens	12.261	2.75	**0.006**
	Tdta	-0.044	-2.53	**0.011**
	Pvol	-0.077	-2.82	**0.005**
	roat1	0.235	8.43	**0.000**
	R-sq.			**0.3970**
BRD-PNED	Dual	0.325	4.47	**0.000**
	c1c4	0.052	5.83	**0.000**
	c2c3	0.064	5.49	**0.000**
	Abho	-0.054	-8.82	**0.000**
	Nbh	0.164	6.67	**0.000**
	Divps	0.000...	0.00	1.000
	Fcfps	0.008	0.88	0.380
	Invincr	0.000...	1.50	0.132
	Tointens	-0.415	-2.15	**0.032**
	Tdta	0.001	1.25	0.210
	Pvol	-0.002	-1.53	0.127
	roat1	0.0003	0.44	0.639
	R-sq.			**0.8535**
BRD-DUAL	Pned	1.010	33.63	**0.000**
	c1c4	0.006	4.42	**0.000**
	c2c3	-0.009	-3.31	**0.001**
	Divps	-0.157	-6.24	**0.000**
	Fcfps	-0.015	-1.25	0.213
	Invincr	-0.000...	-2.19	**0.029**
	Tointens	-0.626	-4.23	**0.000**
	Tdta	-0.005	-10.72	**0.000**
	Pvol	-0.009	-11.80	**0.000**
	roat1	-0.005	-5.45	**0.000**
	R-sq.			**0.6000**
DOMIN-C2C3	Pned	24.544	4.21	**0.000**
	Dual	-11.658	-2.34	**0.020**
	c2c4	-0.845	-2.33	**0.020**
	Abho	0.927	8.76	**0.000**
	Nbh	-3.136	-31.56	**0.000**
	Divps	-1.052	-1.18	0.239
	Fcfps	-0.176	-0.84	0.402
	Invincr	-0.000...	-1.51	0.131
	Tointens	6.546	1.94	**0.052**
	Tdta	-0.035	-1.59	0.111
	Pvol	-0.015	-0.36	0.720
	Eqto	-0.674	-1.77	**0.076**
	roat1	-0.022	-0.89	0.376
	R-sq.			**0.9457**
CONTEST-C1C4	Pned	22.858	2.44	**0.015**
	Dual	-10.795	-1.79	**0.073**
	c1c4	-0.895	-2.51	**0.012**
	Abho	0.900	3.70	**0.000**
	Nbh	-2.849	-2.67	**0.008**
	Divps	-0.866	-0.89	0.372
	Fcfps	-0.187	-0.93	0.350
	Invincr	-0.000...	-1.40	0.162
	Tointens	5.285	1.21	0.226
	Tdta	-0.032	-1.37	0.172
	Pvol	-0.006	-0.15	0.878
	Eqto	-0.549	-1.17	0.243
	roat1	-0.024	-1.05	0.293
	R-sq.			**0.8807**

Board Independence (BRD-PNED) Equation: The 3SLS results for the equation are different from the same equation in the first version of the SEM (*section 5.6.1*). Again DUAL, C1C4, C2C3, DIVPS, ABHO, NBH and TOINTENS are determinants of PNED at 1%α-level with the exception

to TOINTENS that show significant effect at 5%. The remaining explanatory variables remained insignificant again. This is another indication of the stability of our nonrecursive structural model. Additionally, from the R-squared (85.35%) of the equation, it might be indicative that the equation has a good fit.

The *positive* impact of C1C4 and C2C3 on the PNED might suggest that when there are both dominant and contesting coalitions, the contestability in the decision-making processes would enhance the proportion of independent directors. However, caution is also required in concluding this way since the recommendations on the independent board members in the UK Code might also have the impact of enhancing the increase in the PNED. Additionally, CEO-duality has *positive* impact on PNED at 1%α in the presence of C1C4 and C2C3. This might imply that when there are coalitions of dominants and that of contestants, the decision-making process would favour CEO-duality so that a unified leadership is attained, and that board independence might not matter for the firm.

Board Leadership (BRD-DUAL) Equation: Another interesting result is that all variables except FCFPS are found to be determinants of CEO-duality at a higher significance level of 1%α except INVINCR that is significant at 5%α. So, we have high confidence to suggest that PNED, C1C4, C2C3, DIVPS, INVINCR, TOINTENS, TDTA, PVOL and lagged performance are determinants of CEO-duality. The fairly higher R-squared (60%) of the model might be the indication of a fairly good fit of the equation in the SEM. The similarity of the result to those presented in *section 5.6.1* and 5.*6.2* show that the SEM model is stable.

The dominance and contestability variables (C1C4 and C2C3) show significant positive and negative impact on CEO-duality at 1%α respectively. The dominance variable (C1C4) enhances CEO-duality, implying that the CEO-duality is preferred when the dominants monopolize control. However, the contestant variable is found to show negative relation with CEO-duality as expected; and this might suggest that as the contesting power of the coalition increases, CEO-duality will diminish. As previously observed, from the positive impact of PNED on DUAL at 1%α, it might be suggestive that board independence enhances CEO-duality. This might happen in a sense that they might be more confident and better positioned to participate actively in the decision-making process of the firm and might favour CEO-duality as the proportion of NEDs increases for the UK listed firms. Finally, we remind that the interpretations of the results on the rest of the variables are predominantly similar to the same equation in the two preceding versions of the model.

Control Dominance (DOMIN-C1C4) Equation: According to the results of the equation, PNED, DUAL, C2C3, ABHO, NBH, TOINTENS, and EQTO are the determinants of control dominance in the firm (C1C4). Overall, from the R-squared statistic, we can cautiously say that 94.57% of the variations in C1C4 are explained by all the variables in the model. However, the similarity of the results with other previous versions assures us of the stability of the SEM. The interpretation of the results of many of variables is similar to the two previous sections (especially *section 5.6.1*).

The result shows that the contestability variable (C2C3) has a *negative* impact on C1C4 at 5%α. Hence, as contestability increases, the position of the dominant coalition will diminish as expected *per se* the theoretical model. Moreover, PNED has positive impact on C1C4 at 1%α. This result is difficult to interpret in the real economic life peculiar to the UK since it is expected that the PNED might curb the control power of the dominant coalition. It might be suggestive that the rising voting

power of the C1C4 makes it difficult to counter-balance it. CEO-duality has a *negative* impact on the dominant coalition at 5%α, implying that the presence of CEO-duality might reduce the dominant position of C1C4.

Control Contestability (CONTST-C2C3) Equation: The result of the 3SLS regression is similar to those in the previous two sections. Only PNED, DUAL, C1C4, ABHO, and NBH are found to be determinants of contestability (C2C3). From the R-squared statistic, it might be suggested that 88.07% of the variations of C2C3 are explained by all of the variables in the equation, indicating the correct specification of the model.

The interpretation of the results on other variables is almost the same as those in the previous sections. Nevertheless, the dominance variable (C1C4) shows *negative* significant impact on control contestability (C2C3) at 5%α as expected according to the theoretical model of this research. Contestability must diminish as the monopolization of control is enhanced via the increase in the voting power of the dominant coalition. Moreover, PNED has *positive* impact on contestability of control at 5%α. This result is as expected since it is suggestive that the increase in PNED should enhance contestability. In the UK case, this might be possible due to high investor protection and the counter-balancing between C1C4 and C2C3 that might favour control by the boardroom. Finally, the result shows that CEO-duality has *negative* significant effect on C2C3 at 10%α. This shows that the control power of the contestants (C1C3) might diminish in the presence of CEO-duality.

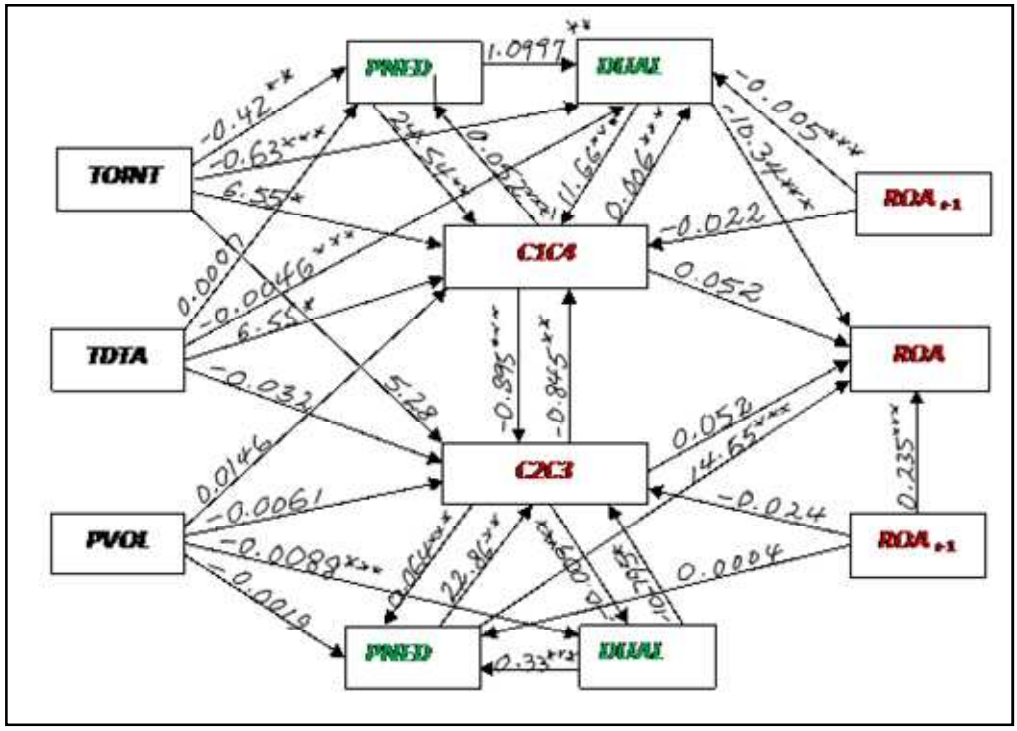
5.6.3.2 Control Balance in the Feedback Loop of C1C4-C2C3 Model

C1C4 ←→ C2C3: Comparison of the magnitude of the *negative* effects in the feedback loop of C1C4 (0.895 at 1% α) than the reversal *negative effect* of C2C3 (0.845 at 5%α) shows that C1C4 dominates, even though the closer magnitude might imply that they counter-balance each other.

C1C4 ←→ PNED: The magnitude of the *positive* effect (0.052 at 1%α) of dominance by C1C4 on the NEDs is lower than reciprocal *positive* impact of PNED on C1C4 (24.54 at 5%α). Hence, the insight is that as the proportion of the nonexecutives in the board increases, the dominance of C1C4 coalition will be enhanced for the UK firms. The result confirms the evidence in the previous version of the model.

C1C4 ←→ DUAL: The magnitude of the *positive* effect of the dominant coalition on CEO-duality at 1% α is quite small (0.006) compared to the *negative* impact of DUAL on C1C4, which is 11.66. Hence, the presence of CEO-duality diminishes the dominance of the coalition of C1C4. This might be related to the leadership unifying effect of CEO-duality that might deter the collective action of colluding dominant blockholders in the listed firms. Based on this fact, it might be suggested that CEO-duality might mitigate the second-order agency problem where external blockholders might act to control the firm for private benefits of control.

Fig. 5.9: Three-Stage Least Squares Regression of C1C4-C2C3 Model



Note: Own manual construction from *table 7.19*.

C2C3 ←→PNED: C2C3 has little *positive* impact (0.064 at 1%α), whereas PNED has a positive impact (22.86 at 5%α) on C2C3 as it has on C1C4. The plausible conclusion from the magnitude of the effects is that the rise in the PNED in the board of directors enhance the existence and power of the contesting coalition (C2C3). This might make the sense since the PNED might be in favour of the existence of contestability or the existence of two opposing forces in the boardroom so that the check and balance prevails.

C2C3 ←→ DUAL: The magnitude of the *negative* effect of DUAL (10.795 at 10%α) is greater than the *negative* effect of C2C3 (0.0087 at 1% α) might imply that the presence of CEO-duality diminishes the power of the contesting coalition (C2C3) as it diminishes the dominating coalition (C1C4). Hence, the unification of board leadership, CEO-duality, might be used to deter the control power struggle between the dominant coalitions and the contesting coalitions.

DUAL ←→ PNED: The SEM 3SLS regression results show that DUAL and PNED have *positive* impacts on each other at 1% α. Comparison of the magnitude of the effects shows that PNED has greater causality effect on DUAL than the reversal effect of DUAL on PNED. The statistical interpretation is that the presence of CEO-duality is enhanced by the increase in the proportion of nonexecutives in the board. This evidence from the UK listed firms is surprising and counterintuitive as the opposite effect is expected based on the principles set in the UK Code of Best Practices.

5.6.4 Monopolizability & Contestability Ratios: MONR vs. CONTR

5.6.4.1 3SLS Results on the MONR-CONTR Model

Performance (PRFM-ROA) Equation: As it can be observed from *table 5.20,* the 3SLS regression result for MONR-CONTR model show that DUAL, MONR, INVINCR, TDTA, SPVOL, and ROA_{t-1} are determinants of ROA. The result has close similarity with the other versions of the model. As in the previous section ABHO and FCFPS are found to show *insignificant* influence on ROA.

The result shows that MONR is determinant of firm performance whereas CONTR is not. MONR has significant effect on ROA at 1% α-level. Hence, the *positive* insignificant effect of CONTR makes it different from the other versions of the SEM used in the previous three sections where both dominance and contestability variables are simultaneously and consistently significant or insignificant. This is difficult to reason or explain. However, it is worthwhile to note that the preceding two versions of the model also show *positive* impact of the control dominance variable (MONR) on ROA. Another surprising result is that PNED is *slightly insignificant* as in TPDI-SHAPV model. However, DUAL still has *negative* significant impact on ROA at 1% α. Moreover, TOINTENS shows positive insignificant relationship with ROA, where as TDTA and PVOL exhibit significant *negative* impact on ROA at 1% α.

Board Independence (BRD-PNED) Equation: The 3SLS result on the equation shows that only DUAL, CONTR, TDTA, PVOL and ROA_{t-1} are determinants of PNED. The interpretation of the results on these variables confirms the results of the previous versions of the SEM. For example, PVOL, which used to have negative impact on PNED previously, has now positive impact at 5%α. Such instability raises alarm about the control factors used in this version of the SEM. MONR, ABHO, NBH, DIVPS, INVINCR, and TOINTENS show insignificance association. However, some of the results are interesting and worth mentioning. The control factors DUAL and CONTR show significant *positive* impact on PNED at 1%α as observed in other versions of the SEM. Additionally, the positive significant impact of ROA_{t-1} and TDTA is confirmed at 5% and 1%α respectively.

Board Leadership (BRD-DUAL) Equation: All the explanatory variables except FCFPS and INVINCR show significant relationship with DUAL, and hence, they are determinants of CEO-duality. Hence, PNED, MONR, CONTR, DIVPS, TOINTENS, TDTA, PVOL and ROA_{t-1} are determinants of CEO-duality. The result is generally similar to the previous versions of the model with few exceptions or slight changes. Their negative impact (except PNED and MONR that have positive impact) on DUAL confirms the previous versions (especially *section 5.6.3*) of the SEM. Hence, the interpretations and the discussion of the previous sections hold for this version of the SEM.

Table 5.20: Three-Stage Least Squares Regression of MONR-CONTR Model

		MONR-CONTR		
Equation	**Variable**	**Coef.**	**Z**	**P>z**
PRFM-ROA	pned	14.963	1.64	0.122
	dual	-12.806	-3.57	**0.000**
	Monr	4.219	2.56	**0.010**
	Contr	-1.120	-0.18	0.932
	Abho	0.021	0.77	0.394
	Fcfps	0.203	0.63	0.508
	invincr	-0.000…	-2.28	**0.022**
	tointens	8.130	1.57	0.133
	Tdta	-0.058	-3.83	**0.000**
	Pvol	-0.109	-3.92	**0.000**
	roat1	0.216	9.18	**0.000**
	R-sq.			**0.3698**
BRD-PNED	Dual	0.466	9.37	**0.000**
	Monr	0.048	0.32	0.734
	Contr	0.976	6.25	**0.000**
	Abho	0.001	1.38	0.207
	Nbh	0.006	0.83	0.428
	Divps	0.028	1.50	0.121
	Fcfps	0.010	1.43	0.156
	Invincr	0.000…	0.81	0.410
	Tointens	-0.145	-1.29	0.208
	Tdta	0.004	3.25	**0.001**
	Pvol	0.008	2.15	**0.025**
	roat1	0.004	2.12	**0.032**
	R-sq.			**0.9035**
BRD-DUAL	Pned	1.414	16.45	**0.000**
	Monr	0.231	3.48	**0.001**
	Contr	-1.094	-6.31	**0.000**
	Divps	-0.128	-4.63	**0.000**
	fcfps	-0.021	-1.64	0.103
	invincr	-0.000…	-1.31	0.185
	tointens	-0.349	-2.07	**0.038**
	tdta	-0.004	-8.07	**0.000**
	pvol	-0.008	-10.14	**0.000**
	roat1	-0.004	-4.53	**0.000**
	R-sq.			**0.5247**
DOMIN-MONR	pned	2.140	5.71	**0.000**
	dual	-1.015	-4.55	**0.000**
	contr	-0.421	-1.70	0.249
	abho	0.003	3.77	**0.000**
	nbh	-0.064	-18.14	**0.000**
	divps	-0.077	-2.17	**0.034**
	fcfps	-0.007	-0.75	0.542
	invincr	-0.000…	-1.85	**0.068**
	tointens	0.415	2.81	**0.010**
	tdta	-0.003	-3.39	**0.001**
	pvol	-0.004	-2.53	**0.013**
	eqto	-0.041	-2.96	**0.006**
	roat1	-0.002	-2.11	**0.046**
	R-sq.			**0.5008**
CONTEST-CONTR	pned	0.418	2.90	**0.031**
	dual	-0.298	-4.03	**0.002**
	monr	0.445	2.87	**0.001**
	abho	-0.002	-4.20	**0.000**
	nbh	0.021	2.25	**0.005**
	divps	-0.033	-2.19	**0.063**
	fcfps	-0.012	-1.91	**0.049**
	invincr	-0.000…	-0.50	0.748
	tointens	-0.160	-1.24	0.162
	tdta	-0.001	-3.29	**0.007**
	pvol	-0.002	-3.95	**0.001**
	eqto	0.016	2.20	**0.023**
	roat1	-0.002	-3.07	**0.004**
	R-sq.			**0.7754**

Control Dominance (DOMIN-MONR) Equation: The results on this equation show that with the exception to CONTR and FCFPS all variables are determinants of the monopolizability of corporate control power by a coalition (MONR). PNED, DUAL, ABHO, NBH, DIVPS, INVINCR, TDTA,

PVOL, EQTO, and ROA_{t-1} have significant effect on MONR. All the signs of the coefficients are almost exactly the same as in the previous versions of the SEM and identical with C1C4-C2C3 model. So, the same interpretations used apply here. Anyhow, the contestability variable (CONTR) has not *significant* effect on MONR as in other versions of the model even though it retains negative coefficient. This might be ascribed to the transformation of the voting powers into ratios in order to measure the power ratios.

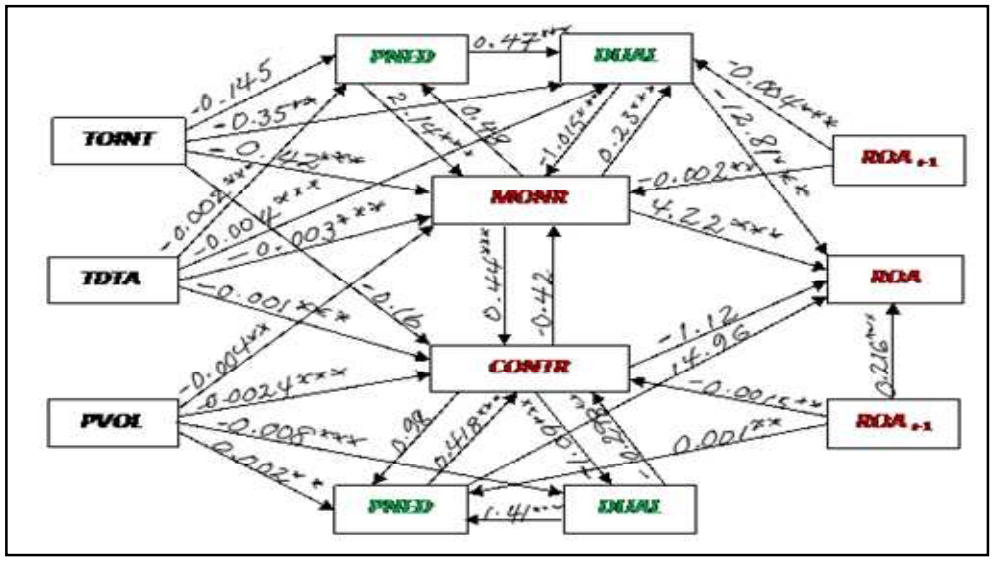
Control Contestability (CONTST-CONTR) Equation: The results of 3SLS regression of this equation show different pattern of relationship between the predictors and CONTR compared with the previous versions of the SEM. Most variables which showed insignificant relation in the preceding versions are significant. The result show that PNED, DIVPS, FCFPS, and EQTO (at 5%α), and DUAL, MONR, ABHO, NBH, TDTA, PVOL, and ROA_{t-1} (at 1%α) are determinants of CONTR. However, INVINCR and TOINTENS are insignificant. Only PNED, DUAL, MONR, ABHO, and NBH are the variables that also show significant effect as in the previous versions. Hence, the previous interpretations hold for them. However, caution is needed in the interpretation of the result on INVINCR and TOINTENS.

5.6.4.2 Control Balance in the Feedback Loop of MONR-CONTR Model

MONR ←→ CONTR: The magnitude of the *positive* impact of MONR on CONTR is 0.44 at 1%α where CONTR has *negative insignificant* impact of 0.42 on MONR. According the result, the impact of the coalition for monopoly (MONR) is greater and significant, implying that MONR enhances contestability.

MONR ←→ PNED: It is observable that the magnitude of the *positive* impact of PNED on MONR (2.14) is greater than the *positive* insignificant effect of MONR on PNED at 1% α. So, as in other versions of the SEM, the result confirms that the increase in PNED enhances MONR.

Figure 6.4: Three-Stage Least Squares Regression of MONR-CONTR Model



Note: Own manual construction from *table 5.20*.

MONR ←→ DUAL: Comparison of the magnitude of the effects in the feedback loop show that DUAL has a greater *negative* impact of 1.015 on MONR at 1% α. Hence, the evidence is that with the presence of CEO-duality, the monopolizability of power by the dominant coalition will diminish. This supports the results in the previous versions of the SEM.

CONTR ←→ PNED: The magnitude of *positive* impact the proportion of nonexecutives in the board on CONTR (0.418) at 5% α is greater compared to the insignificant reciprocal effect of CONTR on PNED (0.98) at 1% α . The evidence supports the other previous versions of the SEM.

CONTR ←→ DUAL: It is observable from the result that the magnitude of significant *negative* effect of CONTR (1.09) on DUAL at 1%α is greater than that of the significant *negative* impact of DUAL (0.298) on CONTR at 5%α. The difference in the result of this version of the SEM is that the resultant effect is that CONTR affects the presence of CEO-duality negatively, thus suggesting that the increase in the power of the contestant coalition will diminish CEO-Duality in UK firms.

DUAL ←→ PNED: Results of this feedback loop show that the magnitude of the *positive* impact of DUAL on PNED (1.414) at 1%α is greater than the *positive* impact of PNED on DUAL (0.4665) at 1%α. This resultant effect indicates that the effect of PNED is greater. The statistical interpretation is that the presence of duality will enhance the board independence. This might imply that if such coalitions exist, PNED is favoured and enhanced by CEO-duality. This might have a policy implication suggesting that it is useful to have united board leadership when such coalitions exist. However, we cast doubt to the result since it contradicts C1C4-C2C3 Model, from which it is transformed.

To sum up, now that the 3SLS regression results and their statistical interpretations are given for each equation in each version of the SEM, it would be required to further discuss the summary of the evidences and their implications. The following section will present the discussions as a prelude to conclusion.

5.6.5 Discussion of the Evidence

Even thought there are several findings or evidence in from the study, we would like to give a brief and general account of the main findings. To do this we present an extract of the determinants of the five equations corresponding to the five dependent endogenous variables when different alternative options of control dominance and contestability are assumed in the SEM using *tables 5.21-5.2.4.* Then we use *table 5.24* to summarize and present especially the indication of the resultant effects in the feedback loop of the nonrecursive SEM.

5.6.5.1 Determinants of Firm Performance

The control dominance and contestability variables show different results with different versions of the SEM. It is observable that VPC1 has a positive insignificant relation with ROA, whereas VPC1 and has negative insignificant impact on ROA (*table 5.21)*. This might indicate that the aggregate control power of the first and the second largest blockholders alone might not be determinants of firm performance in the UK listed firms. However, the power indices of the coalition of the 'First-Two' (TDPI) and their contestants (SHAPV) show *positive* significant effect on ROA. This might imply that the coalition of blockholders and their collective actions (TDPI and SHAPV) rather than their individual control power (VPC1 and VPC2) are important in enhancing firm performance in the UK listed firms. Comparing the magnitude of the effects of TDPI and SHAPV on ROA, the contestability variable (16.95) has greater impact in enhancing firm performance, ROA, than TDPI (6.53). This implies that contestability (SHAPV) is an important determinant factor in enhancing firm performance for the UK listed firms. Moreover, both dominance and contestability variables (C1C4 and C2C3) also show *positive* relation with ROA as in TDPI-SHAPV Model, even though they are not significant. However, there is no such pattern in the model with MONR and CONTR.

Overall, with the exception to the model version where the ratio for monopolizability of control by a dominant coalition is assumed (MONR show significant *positive* impact on ROA), the magnitude of the effects of the contestability variables (CONTR) is greater than that of the dominant variable. Hence, there is evidence that control contestability dominates in the UK listed firms and it enhances firm performance. This confirms that the monitoring hypothesis is valid for the UK listed firms.

There is evidence that gives us confidence that PNED, DUAL, INVINCR, TOINTENS, TDTA, PVOL, and lagged ROA are the determinants of firm performance measured in ROA. PNED, TOINTENS, and lagged ROA enhance firm performance while the rest have the impact of reducing ROA. The results present enough evidence that PNED enhances firm performance despite the negative impact in *TDPI-SHAPV Model*. This confirms and supports (1) the empirical validity of the rationale behind the recommendations in the UK Code of Best Practice and (2) the suggestion of the agency theory on the role of nonexecutive directors as monitors of managers and that the board of directors is the internal governance mechanism. Additionally, the result also shows that the magnitude of the positive impact of PNED (which is assumed as a contestability variable of the BRD) on ROA is greater than the negative effect of CEO-duality (which is assumed as a dominance variable of the BRD) on ROA. From this fact, it is suggestive that there is additional evidence showing that contestability of control has more determinant effect of influencing ROA than control dominance in the board structure for the UK listed firms. Moreover, the evidence that CEO-duality has consistent negative

impact on ROA confirms and supports the rationale behind recommendation of the UK Code of Best Practice.

Table 5.21: 3SLS regression results of the determinants of firm performance (ROA)

	ROA			
	VPC1-VPC2	TDPI-SHAPV	C1C4-C2C3	MONR-CONTR
PNED	12.33***	-12.35	14.654***	14.962
DUAL	-8.22***	-2.13	-10.338***	-12.806***
VPC1	-0.38			
TDPI		6.53***		
C1C4			0.052	
MONR				4.219***
VPC2	0.69			
SHAPV		16.95***		
C2C3			0.065	
CONTR				-1.12
ABHO	-0.1	-0.0885***	-0.033	0.0205
NBH				
DIVPS				
FCFPS	0.3141	0.292	0.299	0.203
INVINCR	-0.0000…*	-0.0000…	-0.0000…**	-0.0000…**
TOINTENS	15.146***	4.64	12.261***	8.13
TDTA	-0.37**	-0.037**	-0.0436**	-0.058***
PVOL	-0.0733***	-0.135***	-0.0772***	-0.1085***
EQTO				
ROA1	0.253***	0.234***	0.235***	0.216***
R-Squared	0.3516	0.2968	0.397	0.3698

The other interesting evidence is that TOINTENS shows positive impact and hence enhance ROA when the dominant and the contestant variables coexist, and PNED has negative or no significant impact on ROA. The evidence supports (1) the agency theory on the role of takeover market as a monitoring and disciplining external governance mechanism and (2) the hypothesis that takeover is a substitute for the internal governance mechanism. Anyway, TOINTENS lose its significance in 2 versions of the SEM. TDTA and PVOL retained their significant *negative impact* on ROA consistently across the versions of the model. Overall, the evidence on TDTA supports the theory of financial distress showing that (1) debt financing reduce firm performance, and (2) debt financing has complementarity effect with CEO-duality that reduces firm performance as it increases. Moreover, as predicted in the theoretical model and suggested by researchers, lagged ROA shows significant *positive impact* on current ROA, thus confirming dynamic endogeneity relationship. Finally, the results show that ownership concentration measured as the aggregate holdings of all blockholders (ABHO) has *negative* impact on ROA even though it shows significance only in one model. Hence, due to the mixed and insignificant effects in one of the versions of the SEM and we conclude that ABHO has *no systematic relation* with firm performance. This is confirms the suggestion of Demsetz and Lehn (1985).

Last but not least, it is counterintuitive that the result on investment increase (INVINCR) that is expected to be positive shows *negative* effect on ROA in three versions of the model and the magnitudes of the negative impact are too small in magnitude to be noticeable. Anyhow, this might suggest that not all investments taken are those with positive net present value (NPV) or will actually lead to profitability. Its negative impact might also suggest that there might be rent diversion or

extraction, and hence agency costs, before the accounting results of the firm are reported. On the other hand, the negative impact of INVINCR on ROA might suggest that the increment in the cost of investment to the firm that does not currently generate cash inflows or does not yet yield break-even might result in the decrease of the accounting performance measure.

5.6.5.2 Determinants of Board Structure: PNED and DUAL

The evidence from the 3SLS regression results shown as *table 5.22* indicate some commonalities of both board structure variables used in the SEM. There is evidence that there is significant positive correlation, which is consistent across the equations and the versions of the SEM, between nonexecutive directors' representation in the board and CEO-duality.

Table 5.22: 3SLS regression results of the determinants of board structures

Panel A: Determinants of NEDs representation

	PNED			
	VPC1-VPC2	TDPI-SHAPV	C1C4-C2C3	MONR-CONTR
PNED				
DUAL	1.095***	0.276***	0.326***	0.466***
VPC1	0.056**			
TDPI		0.964**		
C1C4			0.519***	
MONR				0.048
VPC2	0.101***			
SHAPV		0.604***		
C2C3			0.065***	
CONTR				0.976***
ABHO	-0.57***	-0.0099***	-0.054***	0.0822
NBH	0.229***	0.042**	0.164***	0.006
DIVPS	-0.079*	-0.026	0.0000...	0.0283
FCFPS	-0.006	-0.0012	0.0085	0.0099
INVINCR	-0.0000...	0.0000...	0.0000...	0.0000...
TOINTENS	-0.505*	-0.475***	-0.415**	-0.145
TDTA	0.00002	-0.00193	0.0693	0.0013***
PVOL	-0.00207	-0.0014	-0.0019	0.0017**
EQTO				
ROA1	0.0005	-0.0402	0.659	0.0012**
R-Squared	0.5976	0.5649	0.6	0.5247

Panel B: Determinants of duality

	DUAL			
	VPC1-VPC2	TDPI-SHAPV	C1C4-C2C3	MONR-CONTR
PNED	1.095***	1.415***	1.0997***	1.414***
DUAL				
VPC1	0.006***			
TDPI		0.236***		
C1C4			0.006***	
MONR				0.231***
VPC2	-0.012***			
SHAPV		- 0.268***		
C2C3			-0.0087***	
CONTR				-1.094***
ABHO				
NBH				
DIVPS	-0.153***	-0.118***	-0.157***	-0.128***
FCFPS	-0.015	-0.0133	-0.0152	-0.021
INVINCR	-0.0000...**	0.0000...**	-0.0000...**	-0.0000...
TOINTENS	-0.634***	-0.424**	-0.626***	-0.349**
TDTA	-0.0047***	-0.004***	-0.0047***	-0.0039***
PVOL	-0.0088***	-0.006**	-0.0088***	-0.008***
EQTO				
ROA1	-0.0046***	-0.004***	0.0046***	- 0.004***
R-Squared	0.7448	0.9268	0.8535	0.9035

Additionally, all dominance and contestability variables (VPCI, TDPI, C1C4, MONR VPC2, SHAPV, C2C3, and CONTR) are found to significantly enhance PNED. The result is as expected except for those of dominance variables, which might be the case for the UK listed firms where board structure is enhanced by both dominance and contestability control factors. Moreover, the results also show evidence that control dominance variables would enhance CEO-duality, where as contestability variables have *negative* impact on duality. So CEO-duality diminishes as PNED rises. From the external governance mechanisms, only TOINTENS, which has positive impact on ROA, is found to show consistent negative significant impact on both board structure variables. This is another evidence of the substitution effects of TOINTENS on board structure.

As expected, there is evidence that the ownership concentration (ABHO) and the blockholders concentration (NBH) show negative and positive significant impact respectively on board independence. The evidence is that the increase in ABHO will reduce NEDs' representation in the board (PNED); and the increase in NBH will enhance PNED. Unlike the results on CEO-duality, we do not have conclusive evidence that lagged performance determines PNED. Hence, the evidence show that dynamic endogeneity holds with CEO-duality but not with PNED, where the impact of lagged performance (ROA) is consistently negative and significant across the three versions of the model. The results also show evidence that DIVPS, INVINCR, TOINTENS, TDTA, PVOL, and lagged ROA have negative significant impact CEO-duality, hence, as they increase, CEO-duality will diminish.

5.6.5.3 Determinants of Blockholders Structures

In general, the result summary in *table 5.23* shows that board structure characteristic variables (PNED and DUAL), contestability variables (VPC2, SHAPV, and C2C3), ownership/ blockholder concentration proxy (ABHO, NBH), external TOINTENS and EQTO are determinants of the dominant control (DOMIN) factors. On the other hand, almost the same or countering variables, namely, PNED, DUAL, VPC1, TDPI, C1C4, CONTR, ABHO, and NBH are found to be consistent determinants of all versions of the contestant (CONTST) factors.

The summary *table* shows that there is evidence that PNED has *positive significant effect* on both dominance variables (VPC1, TDPI, C1C4, and MONR) and the contestability variables (VPC2, SHAPV, C2C3and CONTR) in all versions of the SEM. Hence, as PNED increases, the corresponding dominance and contestability variables will increase. The increase of the dominant control variables with the increase in PNED might suggest that the controlling largest blockholder or the controlling coalitions of blockholders might have the incentives to exert their control pressure in reaction. Simultaneously, the contesting largest blockholder or coalitions of blockholders might do the same thing to counter-balance the dominant forces, as supported by the evidence from the result that the contesting power of blockholder(s) is enhanced by the increase in NEDs' representation in the board.

Additionally, the presence of CEO-duality has the *negative effect* on both dominance variables (VPC1, TDPI, C1C4, and MONR) and contestability variables (VPC2, SHAPV, C2C3, and CONTR). The presence of CEO-duality that unifies the leadership of the board of directors by bringing decision control and decision management into one forum. This might make it difficult for the dominant largest blockholder or the controlling coalition to fully exert its control pressure and incentive for private benefits of control and invalidates the necessity of dominance. In such a situation, there is no dominance that worries the contestants and contestability might also diminish. Hence, the

diminishing of dominance and contestability with the presence of CEO-duality confirms the economic and theoretical perspectives. Overall, the significant impact of both internal governance mechanism variables (PNED and DUAL) on dominance and contestability variables in all versions of the SEM might suggest that the UK corporate governance system, where CEO-duality is rare and most of the board members are nonexecutive directors, is mainly characterized by enhancement of control dominance and contestability as PNED increases and the split of duality is enhanced.

Table 5.23: 3SLS regression results of the determinants of control dominance and contestability

Panel A: Determinants of dominance variables

	VPC1-VPC2	TDPI-SHAPV	C1C4-C2C3	MONR-CONTR
	VPC1	TDPI	C1C4	MONR
PNED	26.094***	0.981**	24.544***	2.140***
DUAL	-12.819**	-0.509**	-11.658**	-1.015***
VPC1				
TDPI				
C1C4				
MONR				
VPC2	-1.309**			
SHAPV		- 0.335*		
C2C3			-0.845**	
CONTR				-0.421
ABHO	0.914***	0.009***	0.927***	0.003***
NBH	-3.935***	-0.049***	-3.135***	-0.064***
DIVPS	-0.268	-0.049	-1.052	-0.077**
FCFPS	0.029	-0.0019	-1.177	-0.0065
INVINCR	-15	-0.0000…	-0.0000…	-0.0000…*
TOINTENS	6.469	-0.238**	6.546*	0.415***
TDTA	-0.0331	-0.0013	-0.035	-0.003***
PVOL	-0.0287	-0.0023	-0.015	-0.0038**
EQTO	- 0.9133*	-0.032*	-0.674*	-0.041***
ROA1	-0.0311	-0.0008	-0.022	- 0.0021**
R-Squared	0.8917	0.1153	0.9457	0.5008

Panel B: Determinants of contestability variables

	VPC1-VPC2	TDPI-SHAPV	C1C4-C2C3	MONR-CONTR
	VPC2	SHAPV	C2C3	CONTR
PNED	18.450**	2.833***	22.858**	0.418**
DUAL	-9.137*	-1.451**	-10.795*	-0.298***
VPC1	-0.695**			
TDPI		0.236***		
C1C4			-0.895**	
MONR				0.445***
VPC2				
SHAPV				
C2C3				
CONTR				
ABHO	0.654***	0.0254**	0.900***	0.002***
NBH	-2.773***	-0.129*	-2.849***	0.021***
DIVPS	-0.133	-0.13	-0.866	-0.335*
FCFPS	-0.019	-0.006	-0.187	-0.012**
INVINCR	-0.0000…	-0.0000…	0.0000…**	-0.0000…
TOINTENS	4.306	0.648	5.285	0.16
TDTA	-0.0233	-0.0037	-0.0325	-0.001***
PVOL	-0.0187	-0.0058	-0.006	-0.0024***
EQTO	-0.631	-0.09**	-0.549	0.0163**
ROA1	-0.0233***	-0.0023	-0.0237	-0.0015***
R-Squared	0.7512	0.8017	0.8807	0.7754

Moreover, there is evidence that PNED, DUAL, VPC1, TDPI, C1C4, MONR, VPC2, SHAPV, CONTR are determinants of control dominance and contestability in the UK listed firms. The results suggest the control dominance and contestability variables negatively affect each other, thus confirming the **propositions** in the theoretical framework. Furthermore, the results that contestability variables used in the model negatively impact their corresponding dominance variables is another evidence of control contestability hypothesis. Additionally, ABHO, NBH and EQTO are also found to be significant determinants across equations and versions of the SEM.

Finally, the cross-sectional observation across the equations (columns of *table 5.23)* shows that most of the variables that are insignificant in the first three versions of the SEM have significant impact when MONR and CONTR are used as dependent variables (last columns of *table 5.23)* even though the magnitude of their effects are very low. This should not induce us to reject the other three versions since the transformation of the proportions into the ratios might change the original content of our information on the variables and caution in interpretation is required.

5.6.5.4 Control Balance in the Feedback Loop

General Presentation: The summary of the correlations in the feedback loop of the nonrecursive structural model presented as *table 5.4* show an overall insight into control dominance and contestability and board structure in the UK listed firms. The table is constructed such that (1) the rows are arranged as dominant vs. contestant in the 4 versions of the SEM, (2) the column of feedback loop is arranged also as dominant (DOMIN) vs. contestant (CONTST) where the variable that come in each row are the dominant variable of the model for DOMIN and contestant variable for the CONTST.

Table 5.24: Summary of the reciprocal relationship between dominance and contestant variables

	MAGNITUDE OF EFFECT IN DIFFERENT VERSIONS OF THE SEM			
FEEDBACK LOOP	**VPC1-VPC2**	**TDPI-SHAPV**	**C1C4-C2C3**	**MONR-CONTR**
DOMIN ←→ CONTST	-0.695*** & -**1.31****	-**2.63*** & -0.33*	-**0.895**** & -0.845**	**0.44*** &** -0.42
DOMIN ←→ PNED	0.056** & **26.09*****	0.96** & **0.98****	0.052*** & **24.54****	0.48 & **2.14*****
DUAL ←→ PNED	0.277*** & **1.095*****	0.276*** & **1.42*****	0.326***&**1.0997*****	**1.414***** & 0.4665*****
DOMIN ←→ DUAL	0.006*** & -**12.9****	0.24*** & -**0.51****	0.006*** & -**11.66****	0.23*** & -**1.015*****
CONTST ←→ PNED	0.101*** & **18.45****	0.604***& **2.83****	0.064***&**22.86****	**0.98** & 0.418**
CONTST ←→ DUAL	-0.012** & -**9.14***	-0.27 & -**1.45*****	-0.0087***& -**10.795***	-**1.09***** & -0.298**

The general pattern that can be observed from the *table* is that the magnitude of the impact is greater when the direction is from contestability to dominance (the right hand to the left hand side of the loop) when we observe the columns of the table. This indicates the overall validity of the SEM. The results in the first three versions of the SEM (*columns 2, 3,* and *4*) that correspond to the rows of the feedback loop (*column 1*) show that the magnitude of the effects of contestability variables on dominance variables are generally greater than the impact of dominance variables on contestability variables. The evidence might suggest that generally control contestability dominates over control dominance in the UK listed firms. This supports the contestability of control hypothesis.

Dominance and Contestability in Blockholders Structures: Considering the row 'DOMIN-CONTST' feedback loop of VPC1-VPC2 Model (*row 1; column 2*), we can observe that the effect of contestability (the control power of the second largest blockholder, VPC2) is greater than the dominance variable (the control power of first largest blockholder (VPC1). The resultant *negative* effect of VPC2 on VPC1 might suggest that as contestability by the second blockholder rises, the dominance of the first largest blockholder will decline. This evidence confirms the monitoring hypothesis depicted in the agency theory. It also supports the contestability of control hypothesis which is the basis of our model.

However, in the other three models of the 'DOMIN-CONTEST' feedback loop (*row1; column 3, 4,* and *5 of the table*), where coalitions of blockholders are assumed as dominants and contestants, the magnitude of the effects of the dominant variables is greater than their corresponding contestants. The result shows that the dominant coalitions (TDPI, C1C4 and MONR) have greater effect on their corresponding contestant coalitions (SHAPV, C2C3 and CONTR). Hence, the resultant effects deduced from comparison of the effects in the feedback loop show that the direction of causality goes from dominant coalition to contestant coalition. This implies that the dominant coalitions in the firm are determinants of contestant coalitions.

Moreover, according to the results of the second and third versions of our SEM (*row1; column 3*, and *4*), contestability declines as dominance rises. The evidence is that the increases in control dominance by coalitions will reduce contestability of control. Even though this will not negate the existence of control contestability, it shows that controlling coalitions might have more ability to exert control pressures inherent in their collective voting power to reduce the impact of contesting coalitions. Finally, as previously noted the surprising positive impact of MONR on CONTR of the SEM version when MONR and CONTR are used as dominance and contestability variables respectively (*row 1; column 5*) is difficult to interpret since the model is the transformed version of SEM with C1C4 and C2C3 as dominant and contesting coalitions respectively.

Dominance and Contestability in the Board Structure: As it can be observed from *table 5.24* (*row 3; column 2, 3*, and *4*) the 3SLS regression results show that the magnitude of the *positive effect* of PNED on DUAL is greater than the reversal effect of DUAL on PNED in the first three models. The results on the first three models indicate that the causality effect goes from PNED to DUAL and PNED is one of the determinants of CEO-duality. The statistical interpretation is that the presence of CEO-duality is enhanced with the increase in the proportion of nonexecutives in the board.

The insight that the evidence suggest might be, on the one hand, that as the proportion of nonexecutive directors in the board rises, there is a unified or unitary board leadership in the UK listed firms. It might be suggestive that the higher the proportion of nonexecutive directors the more is the preference of the presence of CEO-duality in the UK listed firms. The result raises the question why the UK NEDs prefer or enhance CEO-duality in the presence of controlling largest blockholder or coalitions of blockholders and their countering corresponding contestants. Hence, it might be suggested that in the presence of high control contestability in the UK listed firms, CEO-duality is preferred when there are dominants and contestants that exert enough pressure to control and monitor each other's behaviour, and in that case the middle solution is to unify the board leadership that might act as neutral and arbitrator between the two opposing control forces within the board. If

this is the case, it might contradict the rationale behind the recommendation of the UK Code of Best Practice on separating CEO-Chair role in the board of directors.

However, the result of the SEM with MONR and CONTEST as dominance and contestant variables shows the opposite causal effect, and we cast doubt on this result since the model is the transformed version of the SEM with C1C4 and C2C3 as blockholders structure variables of dominance and contestability.

To sum up, the determinants of firm performance, board structures, control dominance-contestability in the blockholders' structure and in the board structure are discussed above. The 3SLS regression results of the different versions of the SEM have provided statistically relevant and economically and theoretically insightful evidence. Finally, we present a brief conclusion of the research in the following section.

5.7. CONCLUSION

The issue of control of corporation is so complex that sets of control forces need to be considered. To this end, the main control factors this research considers are board structures, control dominance and contestant largest blockholders or blockholders' coalitions, and external governance mechanisms in order to investigate the control of UK listed firms in the FTSE ALL SHARE Index. In order to do this a theoretical model of control dominance-contestability that could be the basis for the empirical modelling are developed. Then, the empirical model is developed so as to help us to test the theory of control dominance-contestability. The characteristics and nature of relationships that exist between different control forces of the firm particularly multiple feedback loops and endogeneity and its different sources means that several of the control factors and firm performance are determined within a structural system and this necessitates the choice of the structural equation modelling.

The structural equation modelling has enabled us to investigate the different control forces that could impact firm performance and each other at the same time within a system. The nonrecursive SEM model is estimated using 3SLS so as to solve the problem of endogeneity and contemporaneous correlations that might exist across the equations. The detailed results of the 3SLS regressions of the SEM are discussed in the previous section and summary of the evidences are presented. Discussion made on the evidences in *section 6.5* reflects the main findings of the research. However, the insight into the main findings will be presented in two sets.

The first set of findings of the empirical research is related to the determination of firm performance. In determining firm performance measured in ROA, the evidence that the effect of control contestability factors dominates in the UK listed firms and that they enhance firm performance than control dominance forces confirms the monitoring hypothesis of the agency theory. This can be deduced from (1) the greater magnitude in the positive impact of PNED on ROA than the *negative effect* of CEO-duality on ROA, and (2) the greater magnitude of the positive effects of the contestability variables on ROA compared to that of control dominance variables. The evidence also confirms and supports (1) the empirical validity of the rationale behind the recommendations in the UK Code of Best Practice regarding NEDs' representation in the board and CEO-duality, and (2) the suggestion of the agency theory on the role of nonexecutive directors as monitors of managers and that the board of directors is the internal governance mechanism, which determines firm performance. Additional evidence that supports the rationale behind the recommendations of the UK Code of Best Practice is that CEO-duality show consistent *negative* impact on ROA across the models and that PNED has *positive* impact on ROA in two versions of the SEM.

Regarding external corporate governance mechanisms, the evidence that TOINTENS enhances ROA when the dominant and the contestant variables coexist and PNED has negative or no significant impact on ROA supports: (1) the agency theory on the role of takeover market as a monitoring and disciplining external governance mechanism, and (2) the hypothesis that takeover is a *substitute* for the internal governance mechanism. The *consistent negative* impact of TDTA on ROA across the versions of the model while PNED show *positive* influence on ROA provides evidences that support the theory of financial distress by confirming that (1) debt financing reduce firm performance, and (2) debt financing has complementarity effects with CEO-duality.

Moreover, the evidence from the *positive* impact of lagged ROA on current ROA confirms our theoretical model, which is based on suggestions from researchers regarding dynamic endogeneity. One further finding worth mentioning is that lagged ROA negatively and consistently influences CEO-duality provides evidence that support the dynamic endogeneity between firm performance and board structure even though this does not hold for NEDs' representation in the board.

The second set of findings of the research is related to the control dominance-contestability theory. Firstly, the research results provide evidence that control dominance variables would enhance CEO-duality, where as contestability variables have *negative* impact on duality. So the enhancement of CEO-duality by the rise in control dominance factors and the diminishing of duality as contestability rises is evidence of the control dominance-contestability theory from the UK listed firms. Moreover, the negative consistent impact of TOINTENS on both PNED and DUAL might suggest evidence for the substitution effects of takeover on the board of directors.

Secondly, the empirical result of positive impact of NBH on board independence might provide another evidence of control contestability hypothesis from the perspective that as the number of significant blockholders increase there is more active participation in the control (more contestability of control) of the firm that might lead to the choice of sufficient number of nonexecutives. This evidence of control contestability hypothesis is also supported by negative impact of NBH on control dominance variables.

Thirdly, the results that contestability variables used in the model negatively impact their corresponding dominance variables is another evidence of control contestability hypothesis. Moreover, comparison of the effects of the pairs shows further insight and confirmation of the hypothesis.

Fourthly, comparison of the magnitude of the effects in the feedback loops reveals further evidence of the relevance of control contestability hypothesis showing that control contestability dominates. From the resultant higher effect that reveals the direction of causality from contestability to dominance of control, it might be suggestive that contestability of control in firms initiates the enhancement or the reduction of pressure of control dominance in UK firms.

Finally, the other empirical evidence on the relevance of control contestability hypothesis is the decline of the dominance of the largest blockholder as the contesting force of the second largest blockholder rises. However, in the setting when the coalitions of control dominants and contestants exist together, the empirical evidence shows that the direction of causality goes from dominant coalition to contestant coalition, thus implying that the dominant coalitions in the firm are determinants of contestant coalitions. This also supports the control contestability hypothesis and it suggests the situation of Nash equilibrium in competition for power.

Nevertheless, we admit that there are limitations of this study, which are worthwhile to note. Firstly, the theoretical framework of control dominance-contestability theory is not yet developed explicitly in this research study. This study just contributes to the discussions and debates on the theory in the perspectives of blockholders' structures by contributing the notion of *control dominance-contestability perspectives*.

Secondly, it is worthwhile to mention that the blockholders' structures used in the research are arbitrarily chosen based on the high investor protection regime in the UK that might diminish the open use of coalitions by assuming that it might yet be possible for significant blockholders to form undeclared coalitions in order to exert control or monitoring pressure. Additionally, in contrast to our assumptions and confinement to coalition of two blockholders, it might also be possible that coalitions of more than two blockholders can be formed for corporate control purpose.

Thirdly, even though the economic rationale and correlation analysis are used in the selection of instrumental variables, it might still be arguable that they can be weak or have slight relationship (negligible effects) with the endogenous variables. The problem of weak instruments should not question the validity of the study since the problem is common to every research that uses data coming economic situations and firm environments.

Fourthly, even though 3SLS has done its good job, one might still recommend the use of FIML for the estimation of the SEM to strictly handle different types of endogeneity, missing values and contemporaneous and spurious correlations. However, this does not question the validity of the study since 3SLS, which is handy to handle the problem of endogeneity, contemporaneous and spurious correlations, provided intuitive results on control dominance-contestability hypothesis and on other variables consistent with the relevant theories and empirical evidence.

Finally, it might be arguable that the inclusion of DUAL, which takes the value of 0 and 1, as dependent variable in the SEM might pose a problem when using 3SLS. However, the variable is included since the equation of dominance board structure is deemed important. It might be arguable that the procedure is acceptable since the results are almost consistent in the different versions of the SEM and there is stability in the SEM estimation.

To sum up, despite the limitations the empirical evidence noted above suggest that: (1) the control of listed corporations is determined by several control factors that have structural system of relationships; (2) the SEM and the 3SLS estimation confirms some of the agency theory perspectives, the rationale behind the UK Code of Best Practice, and the different sources of endogenous relationships among ownership structure, board structure and firm performance; and (3) it would be suggestive to consider control contestability when we investigate the effect of any individual control force on firm performance. Based on this, the research would suggest that the development of appropriate corporate control theory and board structure model in corporate governance are issues to be considered by researchers in the academia and by regulators in private or public institutions.

CHAPTER SIX

6. CONCLUSION

The PhD research study has investigated the ownership and control structures and their relation with firm performance. The short summary of the evidence from the results of the three empirical parts of the study and their interpretations are discussed in this section.

As a prelude to the investigation of the relationship of ownership and control structures and firm performance, *Chapter Three* of the study has made analysis of ownership and control structures from the control potential perspectives. The analysis of the state of ownership structure confirms previous relevant studies and the data of the UK Office of National Statistics (ONS). The evidence confirms that institutional investors are the most important investor categories and the dominant owners of the UK listed firms' shares. The share ownership by insider is found to be very low even though they are still ranked as the second major owner category. The results show that all the rest of the identifiable blockholder categories own very low proportion of the common shares of the UK listed firms. Hence, institutional ownership and insider ownership are found to be the important owner categories of the shares of the listed firms.

Moreover, the different measures of ownership concentration show that the UK major listed firms share ownership is still diffused; hence the evidence is consistent to the findings of previous researchers, even at the lower threshold of the disclosure rule level (3%) of the UK. Despite the ownership dispersion at 3% cut-off level, the analysis of the number of significant blockholders categories and their ownership stake show evidence of the existence of multiple large shareholders with significant shareholdings that arguably give the incentives and ability to exert control or monitoring pressure on the firm. This might indicate the potential for the second-type agency conflict in the UK firms.

The interesting finding from the evidence in the ownership and control structures is the similar characteristic features of two general groups of owner categories in the evolution of ownership patterns. Firstly, from similar trends ownership patterns, it might imply that insider owners and nonfinancial firms' owners might exhibit similar behavioural characteristics in their investment strategy or that they might follow each other in action since the decision makers are also directors. This might conform to the suggestion that the UK shareholders follow institutional investors in activism. Secondly, external blockholders categories such as institutional investors, family, banks and state might have similar investment outlook or might follow each other or especially institutional investors, who are better informed than the others, as research literature suggests. Moreover, the insight into the similarity of the feature of ownership evolution of insider owners and nonfinancial owners might suggest (1) that management of nonfinancial owners that make investment decisions might have network relationships with insider owners of the firm in which they invest and might follow each other in actions, and (2) that nonfinancial firms that are managed by their respective insiders might be as informed as the inside owners of the firm in which they invest.

Furthermore, the evidence that the first largest blockholder might not be ultimate or sole controller of the firm, and that the coalition of the first 5 largest shareholders cannot even attain majority control in terms of their aggregate voting power might suggests that individual blockholder might

not control the firm solely and impact firm performance; and hence, this might suggest that the collective actions of coalitions and the contestability of control in the UK listed firms where multiple large shareholders with minority voting powers might still have the incentives and ability to exert control or monitoring pressure in the efforts to control the firm by colluding with each other. The indicative collective actions and control contestability suggested an interesting research issue that this study has undertaken in *Chapter Five*.

The insights from the state and evolution of UK share ownership might be as follows. Firstly, as firms increase in size and scope of their operations, the financial capacity of individual or family investors will be limited and might not be able to supply enough capital to the expansion or undertaking of new projects. Hence, other investment vehicles or sources are required to substitute the limited resources from individual investors. Moreover, as firms in the public sector undergo privatization and more of their shares sold in public, the role of state as owner of firms diminish being replaced by other investor types.

Furthermore, with the development of the innovation of institutions that pool funds of individuals or family and other organizations that are investors, the financial capacity to supply equity funds to the firm will increase. This development of institutional investors is what has been going on in the Western World in the last several decades and it might be suggestive that they are the potential force to substitute family or state investors. Since institutional investors are the pool of investors from different owner types, namely individuals or families, nonfinancial firms, state, and banks, it might be suggestive that ownership of modern listed firms is on the process of attaining collective or institutional ownership with the feature of the fundamental private property ownership rights. This might be an unavoidable historical development. Even though the UK institutional investors' stakes has been showing decreases especially in the last two decades according to the UK ONS beneficial ownership data, it might be suggestive the increase in their ownership in this study might have been due to replacement or substitution by their foreign counterparts.

Finally, even though this study has no data on it, the suggestive insight into the historical development and the state of share ownership of institutional investors might be that there will be more institutionalization of share ownership with the increase in the innovation of institutions; and this might result in the control of firms by institutional investors group that have more national level network relations in the UK and that the predominant share ownership will be collective ownership of listed firms that might result in the *third-order agency conflict* between managers of institutional investors on the one hand and the other investors in the firm and the clients of institutional investors on the other hand. It might be suggestive that this might be an interesting research issue that deserves theoretical underpinning and empirical study.

Part Two of the study has investigated the relationship between ownership structure (blockholder categories) and firm performance. The very surprising result on the impact of insider ownership of the UK listed firms on performance is that there is positive significant nonlinear relationship in which the magnitude of the marginal effect decreases as the polynomial order of the term of insider ownership increases. This might indicate evidence of the diminishing marginal profitability suggesting that firm performance will increase at a decreasing rate as insider ownership increases. It might also be argued that the reduced rate of performance with the different roots of the polynomial might indicate the potential for both an incentive and an entrenchment effect, which are

supposed to happen at the same time with one outweighing the other after a certain degree of ownership level. Hence, it might be suggestive that the reduced rate of performance could be due to the increasing impact of the entrenchment effect which reduces the positive benefits from the incentive alignment effect. The evidence is consistent with the alignment of interest hypothesis of Jensen and Meckling (1976) and it is inconsistent with the purely alignment-entrenchment or alignment-entrenchment-alignment hypothesis and related empirical findings in literature. The finding might cast doubts into the use of arbitrary order of polynomials to investigate nonlinear relationship as few of the recent researchers have suggested.

Moreover, the interesting evidence from the result is that like insider ownership, nonfinancial firms' ownership has positive relation with firm performance. The similar impact of INO and NFO on firm performance might suggest the similarity of the decisions or actions on firm investments and strategy made by directors of the investee company and the directors of nonfinancial owners or their network relationships. The evidence supports the similarity of investment strategy or behaviour of INO and NFO regarding the trends of ownership overtime as analysed in *Chapter Three* of this Research Thesis.

Furthermore, the negative relationship between different aggregate outsider ownership and its components, namely external blockholder categories (except nonfinancial firms' owner categories) on firm performance might support the second-type of agency conflict and the appropriation hypothesis in literature. The evidence raises the question how the blockholders interact and share control of the firm, the possibility of coalition of owner types and the possible contestability of control in firms and how firm performance is influenced. This issue is investigated in *Chapter Five.*

The result of the impact of other internal governance mechanisms (board of directors) and market based mechanisms on firm performance show mixed results in terms of consistency with the agency perspectives. Only CEO-duality and board size from board structure variables and takeover intensity from market based governance mechanisms show the expected association with firm performance according to the agency theory and the rationale behind the recommendations of the UK Code of Best Practice. However, the proportion of nonexecutive directors, debt financing and stock price volatility that show negative relation with performance is in contrast to the agency perspectives. This might raise the appropriateness of the usual methodology used in modelling and estimating the effects in literature. The suspect of endogeneity relationship from different sources is believed to probably cause such surprising result and this is checked in *Chapter Five* of this research study.

Part Three investigated possible interaction or behaviour of blockholders in using their ability to exert their control power via their individual or group voting rights attached to their cash flow right in the perspectives of control dominance and contestability and their impact to firm performance using structural equation modelling. The SEM is thought to be appropriate modelling since a one-equation modelling analysis in *Part Two* could not incorporate the economically or theoretically relevant endogeneity relationship properly and the results on some governance mechanisms, namely PNED and TDTA are inconsistent with the agency perspectives.

The evidence shows that the chosen contestability variables, namely, the second largest blockholder (VPC2 though insignificant), the power of the coalition of the 'ocean' (SHAPV), and the coalition of the second and third largest blockholders (C2C3) have positive impact on firm performance. The fact that the magnitude of contestability variables is greater than the dominance variables might suggest

that contestability of control is more dominant than control dominance in the UK listed firms. This is one of the empirical evidence of the control dominance-contestability hypothesis. Moreover, the insignificant positive impact of the first and the second largest blockholders on ROA might indicate that there is no high confidence to conclude that they impact firm performance. This might suggest that the first and the second largest blockholders might not be capable of exerting enough effective control power and control or monitor the firm individually in terms of their voting power and impact firm performance. However, the fact that coalitions of multiple blockholders significantly impact firm performance might indicate that coalitions of blockholders interact and share power to control the UK listed firms and impact performance. From this it is suggestive that first 2 largest blockholders might attain effective control power to exert control pressure and affect performance when they make coalitions that will increase their voting power.

The interesting evidence from the SEM estimations is that the proportion of nonexecutive directors (PNED), which showed negative association with firm performance in *Chapter Four* now show *positive* significant impact on firm performance in the different versions of the SEM. This evidence is consistent with the agency perspectives and the rationale behind the recommendations of the UK Code of Best Practice. Moreover, the result on PNED in the SEM might confirm the endogeneity of PNED and its endogenous relationship with firm performance as literature suggests. However, as in the previous *Chapter* CEO-duality shows consistent negative relationship with performance. This evidence supports the rationale behind the recommendations of the UK Code regarding board leadership. Interestingly, as expected the evidence of significant negative impact of lagged ROA on CEO-duality might indicate the dynamic endogeneity relationship between CEO-duality and firm performance. It might suggest that the increase in the previous negative trend in performance impacts the current choice of board leadership in which there CEO entrenchment diminishes.

Furthermore, the fact that PNED has greater magnitude of impact than DUAL on firm performance and hence the dominance of contestability in the board in impacting firm performance, might provide additional evidence on the dominance of contestability in the UK major listed firms. Further evidence on the dominance of control contestability over control dominance, hence confirming the control dominance-contestability hypothesis, in the UK major listed firms can be observed from the comparison of the magnitude of the effects in the reciprocal loop, where the significant effect of control contestability is greater than control dominance variables in three versions of the SEM.

Finally, as in the previous *Part*, takeover intensity retains its *positive* impact on ROA, whereas debt financing and stock price volatility retained their significant *negative impact* on ROA consistently across the versions of the model. From the evidence, it might be suggestive that external governance mechanisms (takeover intensity and debt financing), and stock price volatility are not endogenous variables confirming the design of the SEM.

The evidence on the determinants of board structure variables shows that all of the blockholder control (dominance and contestability) factors enhance NEDs' representation in the board and the preference of CEO-duality. This might be the case in the UK where the positive impact of blockholder control forces on PNED might also be influenced by the provisions of the UK Code recommendations on nonexecutive directors. However, as expected the control dominance variables enhance CEO-duality, whereas the contestability variables negatively affect CEO-duality. The later implies that in firms where multiple blockholders cooperate in the control of the firm, they do not tend to allow

CEO duality, to reduce the power any individual can wield within the firm's control. The evidence confirms the empirical validity of the control dominance-contestability hypothesis. Additionally, the empirical result of positive impact of the number of blockholders (NBH) on the proportion of nonexecutive directors and the negative impact of NBH on the dominance control factors also provide evidence of control dominance-contestability hypothesis. The evidence of the enhancement of NEDs' representation and the reduction of control dominance as the number of blockholders increases is expected according to the control dominance-contestability hypothesis.

The fact that takeover intensity negatively impacts both PNED and DUAL might suggest the substitution effects of takeover market on board of directors in determining firm performance. Moreover, the significant negative impact of debt financing and stock price volatility on CEO-duality might indicate the substitution effects of the market mechanisms on CEO-duality in determining firm performance. Furthermore, the fact that both board structure variables (PNED and DUAL) show significant impact on blockholder control factors, and that the dominance and contestability factor variables also significantly impact the board structure variables confirms evidence of reverse-causality between board structure and ownership structure, and hence the endogenous relationships between ownership structure and board of directors.

On the other hand, the proportion of nonexecutive directors has significant positive impact on both control dominance and contestability variables, which might suggest that the UK nonexecutive directors might favour both forces to countercheck and counterbalance each other in the control configuration. Moreover, the negative significant effect of CEO-duality on both control dominance and contestability variables might suggest that the ability of owners to exert control or monitoring in the firm diminishes in the presence of CEO-duality that unifies the board leadership and its decision making process. This implies that in firms with CEO-Chair duality there is less control by owners (perhaps otherwise they wouldn't have allowed CEO duality Anyhow, the fact that CEO-duality is rare and most of the board members are nonexecutive directors in the UK (according to our data) might suggest that the UK corporate governance system is mainly characterized by enhancement of both control dominance and contestability such that countercheck and counterbalance are assured when as PNED increases. Furthermore, the evidence that the control dominance and contestability factor variables negatively affect each other confirms the **propositions** in the theoretical framework. Additionally, the results that contestability variables used in the model negatively impact their corresponding dominance variables is another evidence of control contestability hypothesis.

In summary, the empirical study in *Chapter Five* revealed interesting insightful evidence on the relationship among blockholder control factors, board structure, and their impact on firm performance using the control dominance-contestability perspective. Among others, there are key results that confirm (1) the empirical validity of the control dominance-contestability hypothesis, and (2) the endogenous relationships between ownership structure and firm performance, and board structure and ownership structure, and board structure and firm performance, thus confirming the suggestions in research literature.

The evidence for the empirical validity of control dominance-contestability is revealed from the following results: (1) the negative impact of contestability factor variables on their corresponding dominance variables, and the higher magnitude of effect of control contestability variables on control dominance variables in the feedback loop; (2) the diminishing of duality as control

contestability ownership variables rise; (3) PNED, which is assumed to be board's contestability variable, has greater magnitude of impact on duality than the reverse effect of DUAL, which is assumed as board's dominance variable; (4) the positive impact of the number of blockholders on control contestability variables and the negative impact of the number of blockholders on control dominance variables; and (5) the negative impact of control dominance and contestability variables on each other confirms the **propositions** in the theoretical framework of contestability and the control dominance-contestability hypothesis.

The suggestive insights from the evidence on control dominance-contestability hypothesis might be the followings. Firstly, the control configuration of the firm in the presence of multiple large blockholders might be more efficient in enhancing firm performance if corporate control is modelled such that the coalition of blockholders are tolerated or encouraged in the firm so that counter-check and counter-balance is achieved in the firm. Secondly, the control configuration might be more efficient in enhancing firm performance if corporate board is modelled such that the dominance control in the board (DUAL) is counter-checked or counter-balanced by the encouraging contestability in the board (PNED) as attempted in the recommendations of the UK Code. Put together, the implication is that the encouragement of control dominance and contestability simultaneously is required to achieve efficient control configuration in the firm, in which (1) multiple blockholders are prevalent, and (2) there is the potential for the second-order agency conflict. Hence, the findings in the research bear recommendations for the *positive agency theory* since the insights drawn suggest how things should work or should look like in order to achieve efficient control configuration that the maximizes shareholder value.

One the other hand, the evidence from this study that reveal the empirical validity of endogenous relationships are: (1) the positive impact of PNED on firm performance revealed in the SEM might confirm joint endogeneity of PNED and the endogenous (reverse causality) relationship between board of directors and firm performance; (2) the significant negative impact of lagged ROA on CEO-duality, thus showing dynamic endogeneity; (3) both board structure variables (PNED and DUAL) show significant impact on the blockholder structure variables, thus revealing reverse-causality between board of directors and blockholder structure variables; (4) the dominance and contestability factor variables significantly impact the board structure variables, thus confirming reverse-causality between board structure and ownership structure; and (5) the negative impact of takeover intense on both board of directors variables, and the negative impact of debt financing and on CEO-duality indicates the substitution effects of the external governance mechanisms on the internal governance mechanism (board of directors) in determining firm performance.

Nevertheless, arguably the study has some limitations of its own as any other research study. Firstly, it might be argued that the number of years for the panel might be short to reveal significant changes in the evolution of ownership structure. However, the fact that the results using a five years panel data shows that the evolution of the ownership of different ownership and control variables used is around the mean, thus implying equilibrium state, it is arguable that the time period chosen is enough to provide intuitive results. Additionally, the period is chosen so that it is free from major shocks and there is health in the economy that in order to avoid any biases.

Secondly, the study is confined to the UK major listed firms for the periods under review, and this might bar its comparability with data from other countries. The undertaking of comparative study,

however, is not attempted due to the broadness of the research in terms of the consecutive empirical design and it is more than the scope of the study per se the timeframe. It might arguably not a problem since the research study followed similar diverse research studies in literature.

Thirdly, the study falls short of using other higher thresholds for comparisons. The reason for this is that the consideration of more thresholds is found to make study more extensive and complicated than the required scope; and this study followed many other researchers that used the same cut-off level and one threshold. Admittedly, literature shows that different threshold yield different results, thus leading to ambiguities. Hence, it is still an important research issue. Therefore, it is recommended that the future research should work on the issue of control threshold that would give effective or efficient incentives and ability to exert control pressure or to control the firm.

Fourthly, the three board structure variables selected in this research are admittedly too few to include all board characteristics. However, as explained in previously, the attempt made is to select the objectively quantifiable variables rather than using dummy variables that create biases in the results. The three board variables are arguably the most important and determinant factors for the purpose of this study. However, believing that corporate board is an important issue in corporate control and life, the Thesis recommends that future research should work out on the determinants of the board and on the board characteristics and board structure that enhance firm performance.

Fifthly, the study has not made piecewise regressions to further check the alignment-entrenchment or alignment-entrenchment-alignment hypothesis suggested in literature regarding nonlinear relationship between managerial ownership and firm performance. However, that would not arguably create a problem since this research attempted linear regression, and nonlinear regression with one-equation inclusion procedure and a stepwise regression of the polynomials of insider ownership with different roots. So, the three attempts are enough relative to other published researches that used only one procedure. However, the Thesis recommends that future researches should further work on the piecewise regression modelling and procedures (the identification of standardized ranges of ownership particularly). It also recommends that further research work should be done on the modelling of nonlinear insider ownership assumption that contributes a break-through in the debates going on. Finally, researchers should also think about an option of coming up with new theory or hypotheses regarding the issue.

Sixthly, it might be arguable that the regression analysis falls short of controlling for the industry and year differences. This is considered and accommodated in *Chapter Three.* Since the fixed-effects regression and clustering robust regression are used besides the GEE in *Chapter Four*, it is arguable that enough attempt is made for the scope of the study as other researchers did. As for *Chapter Five,* what is considered in the modelling is already so extensive. Accounting for the sources of differences is found to make the study more complex than it is per se its scope. Additionally, attempts are made to avoid dummies that can be sources of biases in the regression results as statistical procedures suggest. Hence, it is arguable that the research undertook acceptable procedure *per se* the complexity of the control dominance-contestability perspectives.

Seventhly, it might be arguable that the inclusion of R&D ratio (RNDTS) and Selling, General and Administration ratio (SGATS) that contribute a lot to variance in the models might affect the specification error of the models and there might also be omitted variables. This is an argument of

statistical procedures. On the one hand, it is admitted and recommended that future research consider the issue. On the other hand, it is also statistically arguable that the omission of the variables that are economically or theoretically relevant to determine the dependent variable from model might lead to specification error. The variables are included in the models of *Chapter Four* because they are believed to be not redundant variables. They are included in the models of *Chapter Five* to play the role of instrumental variables since they are believed to be strictly exogenous variables within the structural equation frameworks.

Eighthly, it might be arguable that the inclusion of the regulated firms such as financial firms and utility companies in the sample might not be appropriate according to some literature. However, the analysis of the state and evolution of ownership structure in *Chapter Three* shows that much difference is not observed when the comparative analysis of regulated and non-regulated firms is undertaken. Based on this fact and since we deal with the analysis of the impact of ownership structure (where owner types are categorized according to their common behaviours and characteristic features, which is common both for regulated or non-regulated firms) on firm performance, this study included regulated firms following other published researches in literature.

Finally, the use of the chosen dominance and contestability control factor variables and models are arbitrary and that it is too early to conclude that the findings on control dominance-contestability model in this study explain the complete framework of the control overall dominance-contestability theory or hypothesis. This is admitted. However, it might be arguable that based on their voting power, the first and the second largest blockholders are taken as the vital players in competing for control and in forming coalitions with those having the next viable incentives and ability to exert control pressure in the hierarchy of ownership stake in the firm. Hence, despite the work's lack of universality, it might be arguable that a reasonable attempt is done to contribute to the debates on the way blockholders interact and share power in the firm. The Thesis recommends that the future research should work on the further refinement of the limitations on dominance and contestability control factor variables and models.

In summary, the Theses of this empirical research study suggest the followings. *Firstly, there is the prevalence of multiple significant blockholders in the modern listed firms even when share ownership is dispersed. Secondly, in the presence of multiple significant blockholders in the firm, there is a likelihood that the second-type agency conflicts between large shareholders and minority shareholders exists, and that might be the dominant force that determines the possible control configuration even in listed firms with dispersed ownership. Thirdly and finally, the traditional one-equation modelling and their estimations in the methodology of looking into the relationship of separate share ownership categories or accounting for few of the categories might not precisely identify (1) the blockholders' (control forces') incentives and ability of exerting control over the modern corporations, (2) the problem of endogeneity that might arise in the relationships, and (3) the way significant multiple blockholders interact and share control of the firms. Hence, the use of structural equations modelling and control dominance-contestability perspectives, in which the roles of blockholders structure control forces, internal and external governance mechanisms, and the problems of endogeneity are accounted for might be appropriate to reveal the control configuration of modern listed firms with multiple large blockholders.*

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APPENDICES

APPENDIX A:

Diagnostic Analyses of OLS Assumptions (Annex to Chapter Four)

Table 4.6 presents OLS regression of the first model and the second model, where the non-linear association of managerial ownership with firm performance accounted for.

Table 4.6: Nonlinear OLS regressions on ROA, the first and the second model

(a): The first Model				*(b): The second Model*			
OLS on ROA				OLS on ROA			
Variable	OLS1	OLS2	OLS3	Variable	OLS1	OLS2	OLS3
ino	0.0607***			ino	0.0571***		
insto	-0.0032	-0.0046	-0.0056	outo	-0.0040	-0.0046	-0.0052
nfo	-0.0050	-0.0054	-0.0056	pned	-2.3552*	-2.5581**	-2.6511**
famo	-0.0265	-0.0200	-0.0171	dual	-2.5713***	-2.5773***	-2.5738***
banko	0.0142	0.0099	0.0076	bsize	0.0099	-0.0017	-0.0070
govo	0.0230	0.0215	0.0214	tointens	7.5307**	7.7145**	7.8798**
pned	-2.5061**	-2.6803**	-2.7564**	tdta	-0.0205*	-0.0209*	-0.0212*
dual	-2.5464***	-2.5601***	-2.5606***	pvol	-0.0877***	-0.0841***	-0.0824***
bsize	0.0084	-0.0037	-0.0091	ta	-0.0000*	-0.0000*	-0.0000*
tointens	7.7429**	7.8793**	8.0178**	age	0.0042	0.0040	0.0038
tdta	-0.0206*	-0.0210*	-0.0212*	rndts	0.0013***	0.0013***	0.0013***
pvol	-0.0891***	-0.0847***	-0.0828***	fats	-0.0027	-0.0025	-0.0023
ta	-0.0000*	-0.0000*	-0.0000*	sgats	-0.0165***	-0.0165***	-0.0165***
age	0.0046	0.0043	0.0040	roat1	0.2647***	0.2663***	0.2670***
rndts	0.0013***	0.0013***	0.0013***	ino2		0.0010**	
fats	-0.0025	-0.0023	-0.0021	ino3			0.0000*
sgats	-0.0166***	-0.0166***	-0.0165***	_cons	9.0976***	9.3400***	9.4533***
roat1	0.2647***	0.2664***	0.2671***				
ino2		0.0010**					
ino3			0.0000*				
_cons	9.1716***	9.4138***	9.5237***				
	legend: * p<.1; ** p<.05; *** p<.01				legend: * p<.1; ** p<.05; *** p<.01		
R^2	0.1388	0.1374	0.1367		0.1385	0.1372	0.1366

Note: *OLS1* is OLS regression when INO is linear; *OLS2* is OLS regression when INO is quadratic; *OLS3* is when OLS regression is cubic.
As indicated in the *legend:* * indicates significance at 10% level; ** indicates significance at 5% level; *** indicates significance at 1% level.

We recall that the data management and analyses made above show that there are problems in using parametric techniques to estimate and test the models due to the problems in the data. The F-tests of the OLS regression model indicate that the fit of the model as a whole is good, which shows that there might not be a problem of specification. However, from the very low R-squared statistics that vary from 13.67-13.88% and the adjusted R-squared that varies from 12.97-13.30%, it is indicative that very low part of the variation in ROA is explained by the included independent variables in the model. This can be the first signal showing that OLS estimators might not be efficient and OLS cannot be the appropriate estimation method. Hence, in order to choose the appropriate estimation methods, we first make diagnostic analyses of the OLS assumptions so as to check whether the NIID assumptions of OLS are met.

Normality of residuals: The *graphical tests for normality* are first checked after OLS estimation. The slim sharper peak of the kernel density plot of the residuals with bell-like normal density overlaying shows the residuals are not normally distributed. Moreover, the P-P plot, the

standard normal probability (P-P) plot to check that the residuals are fitted evenly around the regression line, is sensitive to non-normality in the middle range of the data indicates non-normality of residuals.

Furthermore, Q-Q plot of quantile of residuals against the quantile of a normal distribution is also found to be sensitive to non-normality near the 2 ends or tails of the distribution, thus indicating non-normality. On the other hand, the *numerical tests for normality* of the residuals by the Shapiro-Wilk W test for the null hypothesis of no normal distribution yields the p-value, which is significant. This indicates that we have to accept the null hypothesis, i.e., non-normality of residuals.

Homoscedasticity of Residuals: In the graphical test of heteroscedasticity the plot of residuals against the fitted values with centring at y equal to zero show that the data points exhibit narrowness and scattered patterns at both of the ends, indicating non-constant variance or heteroscedasticity. Moreover, two alternative numerical tests of heteroscedasticity, White's test and Breusch-Pagan test, for the null hypothesis of homogeneous variances show different results. The White test shows significant p-value, indicating constant variance, whereas the Breusch-Pagan test shows insignificant p-value for chi-square, thus indicating non-constant variance or heteroscedasticity. Hence, combining the graphical plots with numerical tests and considering the nature of panel data, the sounding judgment is that the residuals are heteroscedastic.

Multicollinearity: As a first step in checking for multicollinearity between the independent variables, Pearson's pair-wise correlation result is presented as *table 4.7.*

Table 4.7: Pair-wise Pearson correlation of independent variables

	ino	insto	nfo	famo	banko	govo	pned	dual	bsize	tointens	tdta	pvol	ta	age	rndts	fats	sgats
ino	1.00																
insto	-0.11	1.00															
nfo	0.00	-0.15	1.00														
famo	0.17	-0.09	-0.02	1.00													
banko	-0.09	-0.07	-0.07	-0.05	1.00												
govo	-0.05	0.13	-0.02	-0.02	0.04	1.00											
pned	-0.15	0.01	0.00	-0.12	0.04	0.12	1.00										
dual	-0.07	-0.01	-0.01	-0.03	-0.01	0.13	0.60	1.00									
bsize	-0.05	-0.16	0.09	-0.04	0.00	-0.09	-0.34	-0.44	1.00								
tointens	0.11	0.00	0.07	0.07	-0.04	-0.06	-0.26	-0.24	0.16	1.00							
tdta	-0.02	0.01	-0.02	0.00	0.01	-0.09	-0.14	-0.25	0.18	0.15	1.00						
pvol	0.16	0.15	0.06	-0.04	-0.01	-0.06	-0.27	-0.30	0.02	0.12	-0.05	1.00					
ta	-0.04	-0.13	-0.03	-0.03	0.01	-0.02	-0.01	-0.07	0.31	-0.06	0.03	-0.03	1.00				
age	-0.07	-0.12	-0.04	0.09	0.01	-0.03	0.02	0.03	0.02	-0.02	0.05	-0.16	0.01	1.00			
rndts	-0.01	0.00	-0.01	-0.01	-0.01	0.00	0.00	-0.01	-0.01	0.00	-0.02	0.06	0.00	0.00	1.00		
fats	0.04	0.04	0.02	0.03	-0.03	-0.02	-0.01	-0.01	-0.01	0.04	0.06	0.06	-0.01	-0.04	0.21	1.00	
sgats	-0.01	0.01	0.00	-0.01	-0.01	0.00	0.02	0.01	-0.03	0.00	-0.04	0.07	-0.01	-0.01	0.97	0.22	1.00

It can be observed from the table that almost all of the correlations between pairs of the variables are less than 0.60, which shows that they have no problem of multicollinearity, except the 0.97 correlation between RNDTS and SGATS, which indicates they have very strong multicollinearity. The result shows that RNDTS and SGATS might create problem in model specification statistically. However, there is an economic rationale that they are not a function to each other since DataStream

calculates SGATS excluding RNDTS. Nevertheless, it is still necessary to make more checks on multicollinearity in the model.

In order to test for multicollinearity in the residuals, assessment of the variance inflation factor (VIF) is made to check for the level of multicollinearity. The VIF, which leads us to the *tolerance* level of multicollinearity, 1/VIF, of the model (*table 4.8)* shows a mean VIF of 9.74. The overall tolerance value will thus be 0.10267 (= 1/9.74), which is a bit more than 0.10. This shows that there is a multicollinearity problem.

Moreover, the output shows that the VIF of SGATS and RNDTS are greater than 10, thus confirming the result of Pearson's pair-wise correlation matrix (*table 4.7*). As a rule of thumb, such variables merit further investigation. It might indicate that they might be a linear combination of other variables. In the second part of *table 4.8* the VIF has improved a lot (1.23) after omitting SGATS and RNDTS and running the OLS regression and then executing VIF. However, in our panel data, where there are other assumptions not met, it is chosen not to omit one of the two variables from the model before trying to estimate using other methods.

Table 4.8: Variance inflation factor, VIF, and tolerance using STATA

(a) Output of VIF check with all involved variables

Variable	VIF	1/VIF
sgats	78.27	0.012776
rndts	76.83	0.013016
dual	1.99	0.502725
pned	1.76	0.569470
fats	1.59	0.629634
bsize	1.50	0.668675
pvol	1.28	0.780837
insto	1.20	0.834963
tdta	1.18	0.846084
tointens	1.14	0.879289
ino	1.13	0.886909
ta	1.12	0.891494
roatl	1.10	0.911544
famo	1.09	0.920797
nfo	1.07	0.933497
age	1.07	0.935205
govo	1.06	0.940394
banko	1.04	0.962817
Mean VIF	9.74	

(b) Output after omitting the SGATS and RNDTS variables with very high VIF

Variable	VIF	1/VIF
dual	1.97	0.506676
pned	1.75	0.570234
bsize	1.49	0.669521
pvol	1.28	0.782821
insto	1.19	0.839610
tdta	1.16	0.863537
tointens	1.14	0.879386
ino	1.13	0.887959
ta	1.12	0.892092
famo	1.08	0.922846
roatl	1.08	0.923770
nfo	1.07	0.933742
age	1.07	0.936236
govo	1.06	0.940427
fats	1.04	0.962346
banko	1.04	0.962953
Mean VIF	1.23	

Moreover, another check of multicollinearity made (*table 4.9)* shows that despite the lower VIF of 9.54, it can be observed that the VIF for RNDTS and SGATS and an additional variable are still too high. The conditional number, which is commonly used as index of global instability of the regression coefficients show a figure of 33.4746, where the value 10 or more is an indication of instability of the coefficients due to the possible impact of multicollinearity problem, mainly contributed by RNDTS and SGATS. The same results are observed estimating and also testing our second model. However, since (1) we know that the data on RNDTS and SGATS that measure different items are not function of each other, (2) the tolerance from the VIF is not far away from 10 in *table 4.8*, and (3) since the omission of one of the variables from the equations might create the problem of omitted variables (omitted variables bias), it is decided to retain them in the model.

Table 4.9: Index of global instability from STATA

Variable	VIF	SQRT VIF	Tolerance	R-Squared
ino	1.13	1.06	0.8876	0.1124
insto	1.20	1.09	0.8342	0.1658
nfo	1.07	1.03	0.9335	0.0665
famo	1.08	1.04	0.9233	0.0767
banko	1.04	1.02	0.9639	0.0361
govo	1.06	1.03	0.9413	0.0587
pned	1.75	1.32	0.5707	0.4293
dual	1.99	1.41	0.5018	0.4982
bsize	1.51	1.23	0.6630	0.3370
tointens	1.14	1.07	0.8794	0.1206
tdta	1.17	1.08	0.8582	0.1418
pvol	1.28	1.13	0.7797	0.2203
ta	1.14	1.07	0.8802	0.1198
age	1.07	1.03	0.9353	0.0647
rndts	74.78	8.65	0.0134	0.9866
fats	1.43	1.20	0.7000	0.3000
sgats	77.18	8.79	0.0130	0.9870
roat1	1.10	1.05	0.9117	0.0883
Mean VIF	9.56			

	Eigenval	Cond Index
1	7.3609	1.0000
2	2.3404	1.7735
3	1.2433	2.4332
4	1.0961	2.5915
5	0.9675	2.7582
6	0.9439	2.7925
7	0.8250	2.9870
8	0.7789	3.0742
9	0.7448	3.1438
10	0.6385	3.3953
11	0.6089	3.4768
12	0.4354	4.1119
13	0.3563	4.5454
14	0.2999	4.9543
15	0.1847	6.3130
16	0.0919	8.9487
17	0.0642	10.7110
18	0.0130	23.8343
19	0.0066	33.4746
Condition Number		33.4746

Eigenvalues & Cond Index computed from scaled raw sscp (w/ intercept)
Det(correlation matrix) 0.0018

Linearity: The plotting the standardized residuals against each predictor variable in the model to check for linearity between the predictors and the response variable show that they show some patterns of linearity. However, it is difficult to establish the linearity by using plots and there is also a room for non-linearity. For instance, we have a good theoretical reason to believe that INO might not be linearly correlated with performance.

Independence of errors: In the panel data values that comes from the same variable overtime and when there can be some form of homogeneity among the elements in a group, it is more likely that the errors of different observations can be correlated (autocorrelation of errors) with the adjacent time or group than those separated in time or in heterogeneity. The Durbin-Watson test for autocorrelation made shows that the observed value of DW statistics here is 1.145, which is less than 2, the midpoint of the range of the statistics that is from 0 to 4. The DW lower and the upper critical values for the statistic are 1.576 and 1.967 respectively. The DW statistics, 1.145, falls below the lower *dw* statistic, 1.576, thus, showing the evidence of positive autocorrelation at 5% significant level.

```
. dwstat

Number of gaps in sample:  663

Durbin-Watson d-statistic( 19,  2228) =  1.145042
```

Model specification test: The last diagnostic test on the model is to ensure whether the appropriate variables are included and/ or omitted from the model. This is important since (1) if one or more of the relevant variables are omitted, the common variance they share with the rest in the model may be wrongly attributed to the included variables, and the error term is inflated, and (2) if the irrelevant variables are included, the common variance they share with the rest in the model would wrongly be attributed to the irrelevant. The model specification problems or errors would affect the estimated regression coefficients substantially, and it is difficult to know the exact influence contributed by a predictor variable on the dependent variable.

One of the methods of detecting specification errors is by using the predicted values and the square of the predicted values and regress them on the dependent variable as predictors and check their significance. The premise is that when the regression model is properly specified, there should not be any additional predictor variables that are significant. The post estimation *linktest* (*table 4.10, Panel A*) shows that the predicted value variables (**_hat**) is significant, thus indicating that there is no specification error. Additionally, the square of the predicted values (**_hatsq**), which is expected to be insignificant (0.133) for correct specification, have no explanatory power. Hence, the linktest in which the expected significance of **_hat** is significant and **_hatsq** is insignificant reveals that our first model is specified correctly, and there is no omitted variable.

The other specification test, called the Ramsey RESET test (*table 4.10, Panel B*), is another test for omitted variables. It creates new variables based on the predictors and refits the model using the new variables and test if any of them would be significant. In STATA, the **ovtest** command (a post-estimation command) executes this test. The test, as it can be seen below, shows that the F-test is significant to reject the null hypothesis of no omitted variables. This indicates that there is specification error, thus, omitted variables.

Table 4.10: Linktest and Ramsey RESET test for model specification using STATA

Panel A: Linktest for model specification, STAT

roa	Coef.	t	P>t
_hat	0.9407	14.28	0
_hatsq	0.0071	1.5	0.133
_cons	0.0135	0.04	0.97

Note: The goodness-of-fit statistics are: N = 2228; F(2,2225) = 180.66; Prob>F = 0.0000; R^2 = 0.1397; and Adjusted R^2 = 0.1389.

Panel B: Ramsey RESET test, STAT

```
Ramsey RESET test using powers of the fitted values of roa
       Ho:  model has no omitted variables
                 F(3, 2206) =      10.24
                   Prob > F =      0.0000
```

Finally, even though the results of the two tests used lead us to two opposite conclusions, we assume that there might be omitted variables since there can be several other factors that can affect firm performance. This is what the R-squared statistics suggest. Adding more predictors into the model might improve the R-squared. However, this is not an option since we have already many predictors and the addition of more variables in the model affects the degrees of freedom.

APPENDIX B:

Regression Results in the Primary Analysis (Annex to Chapter Four)

Table 4.17: Regressions on ROA and ROE using OLS, White's sandwich, IWLS, and clustering robust estimations on the second model

OLS-Robust estimates on ROA

Variable	OLS	RobWhite	RobCluster	RobIWLS
ino	0.0571***	0.0571***	0.0571**	0.0201**
outo	-0.0040	-0.0040	-0.0040	-0.0149***
pned	-2.3552*	-2.3552**	-2.3552	-2.8397***
dual	-2.5713***	-2.5713***	-2.5713***	-2.4755***
bsize	0.0099	0.0099	0.0099	-0.0575*
tointens	7.5307**	7.5307**	7.5307*	3.1588*
tdta	-0.0205*	-0.0205*	-0.0205	-0.0033
pvol	-0.0877***	-0.0877***	-0.0877	-0.0355***
ta	-0.0000*	-0.0000**	-0.0000*	-0.0000***
age	0.0042	0.0042	0.0042	0.0032
rndts	0.0013***	0.0013***	0.0013	-0.0136***
fats	-0.0027	-0.0027	-0.0027	-0.0026
sgats	-0.0165***	-0.0165***	-0.0165	-0.0057***
roat1	0.2647***	0.2647***	0.2647***	0.3163***
_cons	9.0976***	9.0976***	9.0976***	8.2007***

legend: * p<.1; ** p<.05; *** p<.01

OLS-Robust estimates on ROE

Variable	OLS	RobWhite	RobCluster	RobIWLS
ino	0.0873	0.0873	0.0873	0.0204
outo	-0.0500	-0.0500	-0.0500	-0.0453***
pned	-9.5513	-9.5513**	-9.5513	-6.8138***
dual	-7.5354***	-7.5354***	-7.5354**	-7.7988***
bsize	0.8791**	0.8791	0.8791	0.0773
tointens	2.7897	2.7897	2.7897	-4.9275
tdta	0.0233	0.0233	0.0233	-0.0230
pvol	-0.2987***	-0.2987***	-0.2987*	-0.0802***
ta	-0.0000*	-0.0000**	-0.0000	0.0000
age	-0.0339	-0.0339*	-0.0339	-0.0075
rndts	0.0023	0.0023***	0.0023*	-0.0194***
fats	-0.0438**	-0.0438***	-0.0438**	-0.0102*
sgats	-0.0258	-0.0258***	-0.0258*	-0.0145***
roet1	0.1681***	0.1681***	0.1681***	0.2253***
_cons	25.6049***	25.6049***	25.6049**	20.4451***

legend: * p<.1; ** p<.05; *** p<.01

R^2	0.1385	0.1385	0.1385	-	0.0804	0.0804	0.0804	-

Note: As indicated in the *legend:* * indicates significance at 10% level; ** indicates significance at 5% level; *** indicates significance at 1% level.

OLS is ordinary least squares estimation where linear assumption of INO is used; RobWhite is White's sandwich robust estimation; RobCluster is cluster robust estimation that uses industry as a factor; and RobIWLS is the robust regression that uses iterated weighted least squares method.

Table 4.18: Regressions on MTBV and PER using OLS, White's sandwich, IWLS, and clustering robust estimations on the second model

OLS-Robust estimates on MTBV

Variable	OLS	RobWhite	RobCluster	RobIWLS
ino	0.0662	0.0662	0.0662	0.0062**
outo	0.0450	0.0450	0.0450	-0.0032***
pned	-8.8351	-8.8351	-8.8351	-0.6023***
dual	0.2278	0.2278	0.2278	-0.9325***
bsize	-0.0418	-0.0418	-0.0418	0.0253***
tointens	16.0625	16.0625	16.0625	-0.2444
tdta	-0.1486*	-0.1486	-0.1486	0.0004
pvol	-0.2588*	-0.2588	-0.2588	0.0122***
ta	0.0000	0.0000	0.0000	-0.0000***
age	-0.0095	-0.0095	-0.0095	0.0002
rndts	0.0029	0.0029***	0.0029*	0.0007***
fats	0.0062	0.0062	0.0062	-0.0023***
sgats	-0.0129	-0.0129	-0.0129	-0.0004
mtbvt1	0.0098	0.0098	0.0098	0.0064***
_cons	14.5276	14.5276	14.5276	2.1451***

legend: * p<.1; ** p<.05; *** p<.01

OLS-Robust estimates on PER

Variable	OLS	RobWhite	RobCluster	RobIWLS
ino	-0.2518	-0.2518	-0.2518**	0.0064
outo	-0.1533	-0.1533	-0.1533	-0.0051
pned	81.4848*	81.4848**	81.4848**	0.0871
dual	46.0523**	46.0523***	46.0523***	4.2341***
bsize	-1.0812	-1.0812	-1.0812	-0.0537
tointens	-78.2725	-78.2725**	-78.2725***	0.2800
tdta	0.0375	0.0375	0.0375	-0.0096
pvol	0.3509	0.3509	0.3509	-0.0789***
ta	-0.0000	-0.0000	-0.0000	-0.0000
age	-0.2524	-0.2524	-0.2524	0.0018
rndts	-0.6833	-0.6833	-0.6833	-0.0793*
fats	-0.0125	-0.0125	-0.0125	0.0120**
sgats	0.4588*	0.4588	0.4588***	0.0277***
pert1	0.2674***	0.2674**	0.2674*	0.7558***
_cons	-14.6809	-14.6809	-14.6809	7.1689***

legend: * p<.1; ** p<.05; *** p<.01

R^2	0.0253	0.0253	0.0253	-	0.0529	0.0529	0.0529	-

Note: As indicated in the *legend:* * indicates significance at 10% level; ** indicates significance at 5% level; *** indicates significance at 1% level.

OLS is ordinary least squares estimation where linear assumption of INO is used; RobWhite is White's sandwich robust estimation; RobCluster is cluster robust estimation that uses industry as a factor; and RobIWLS is the robust regression that uses iterated weighted least squares method.

Table 4.19: IWLS regressions on ROA, MTBV, ROE and ROE using IWLS robust estimations on the second model

IWLS robust estimates

Variable	ROA	MTBV	ROE	PER
ino	0.0201**	0.0062**	0.0204	0.0064
outo	-0.0149***	-0.0032***	-0.0453***	-0.0051
pned	-2.8397***	-0.6023***	-6.8138***	0.0871
dual	-2.4755***	-0.9325***	-7.7988***	4.2341***
bsize	-0.0575*	0.0253***	0.0773	-0.0537
tointens	3.1588*	-0.2444	-4.9275	0.2800
tdta	-0.0033	0.0004	-0.0230	-0.0096
pvol	-0.0355***	0.0122***	-0.0802***	-0.0789***
ta	-0.0000***	-0.0000***	0.0000	-0.0000
age	0.0032	0.0002	-0.0075	0.0018
rndts	-0.0136***	0.0007***	-0.0194***	-0.0793*
fats	-0.0026	-0.0023***	-0.0102*	0.0120**
sgats	-0.0057***	-0.0004	-0.0145***	0.0277***
roat1	0.3163***			
mtbvt1		0.0064***		
roet1			0.2253***	
pert1				0.7558***
_cons	8.2007***	2.1451***	20.4451***	7.1689***

legend: * p<.1; ** p<.05; *** p<.01

R-squared	-	-	-	-

Note: As indicated in the *legend:* * indicates significance at 10% level; ** indicates significance at 5% level; *** indicates significance at 1% level.

R^2 is not reported for RobIWLS.

Appendix C:

Regression Results in the Sensitivity or Consistency Analysis Annex to Chapter Four)

Table 4.22: Regression with nonlinear assumption of insider ownership in one-equation setting on ROA using median, fixed-effects and GEE estimations on the first model

ROA

Variable	Quant50	YearFE	IndustFE	Year_GEE
ino	0.0248	0.1172	0.1684*	0.1278
ino2	-0.0012	-0.0022	-0.0044	-0.0027
ino3	0.0000	0.0000	0.0000	0.0000
insto	-0.0059	0.0022	-0.0007	0.0012
nfo	0.0028	-0.0252	-0.0113	-0.0211
famo	-0.0091	-0.0247	-0.0157	-0.0258
banko	-0.0302**	0.0356	0.0253	0.0317
govo	-0.0290	0.0051	-0.0021	0.0090
pned	-2.2341***	-2.2641*	-1.4764	-2.2800**
dual	-3.0812***	-2.3635***	-1.0193	-2.3983***
bsize	-0.1056***	0.0419	0.0248	0.0366
tointens	4.2419***	9.4925**	3.0509	9.1501
tdta	-0.0072*	-0.0197*	-0.0263**	-0.0198
pvol	-0.0391***	-0.0829***	-0.1284***	-0.0847
ta	-0.0000***	-0.0000*	-0.0000	-0.0000*
age	0.0045**	0.0055	0.0019	0.0054*
rndts	0.0008***	0.0014***	0.0012***	0.0014***
fats	-0.0035**	-0.0030	0.0030	-0.0029
sgats	-0.0091***	-0.0170***	-0.0149***	-0.0169***
roat1	0.3417***	0.2640***	0.2455***	0.2641*
_cons	8.0451***	8.1647***	9.4671***	8.3046**

legend: * p<.1; ** p<.05; *** p<.01

R-squared	**0.1635**	**0.1399**	**0.1058**	**-**

Note: YearFE is fixed effect regression for time differences; IndustFE is fixed regression for industry differences; Quant50 is median regression; and YearGEE is general equations estimation regression taking year as categorizing factor. As indicated in the *legend:* * indicates significance at 10% level; ** indicates significance at 5% level; *** indicates significance at 1% level.

Table 4.26: Regressions on ROA, ROE, MTBV, and PER using YearFE, IndustFE, Quant50, and YearGEE estimations of the second model

Panel A: Regressions on ROA and ROE

ROA

Variable	YearFE	IndustFE	Quant50	YearGEE
ino	0.0542***	0.0538***	0.0248***	0.0548***
outo	-0.0025	-0.0014	-0.0076**	-0.0028
pned	-2.2222*	-1.5545	-2.0614***	-2.2444**
dual	-2.4640***	-1.0978*	-3.0932***	-2.4872***
bsize	0.0244	0.0121	-0.0940***	0.0213
tointens	8.8582**	2.6794	3.6104***	8.5790
tdta	-0.0193*	-0.0262**	-0.0056	-0.0195
pvol	-0.0802***	-0.1251***	-0.0393***	-0.0817
ta	-0.0000*	-0.0000	-0.0000***	-0.0000
age	0.0050	0.0018	0.0040**	0.0049*
rndts	0.0014***	0.0012***	0.0009***	0.0013***
fats	-0.0031	0.0028	-0.0031**	-0.0030
sgats	-0.0169***	-0.0150***	-0.0104***	-0.0168***
roat1	0.2649***	0.2471***	0.3433***	0.2649*
_cons	8.4763***	9.7022***	7.8899***	8.5761***

legend: * p<.1; ** p<.05; *** p<.01

R^2	0.1625	0.1385	0.1045	-

ROE

Variable	YearFE	IndustFE	Quant50	YearGEE
ino	0.0722	0.0696	0.0394***	0.0812*
outo	-0.0614	-0.0427	-0.0245***	-0.0544
pned	-12.4666**	-6.0780	-5.7339***	-10.6819***
dual	-6.0050**	-1.4956	-9.4844***	-6.9408*
bsize	1.0092***	1.0066***	0.0788*	0.9288**
tointens	11.2247	-6.7507	-3.9713*	6.0390
tdta	0.0209	0.0208	-0.0209***	0.0224
pvol	-0.2658***	-0.4192***	-0.0946***	-0.2855***
ta	-0.0000**	-0.0000	-0.0000	-0.0000***
age	-0.0297	-0.0465*	-0.0024	-0.0322***
rndts	0.0022	0.0019	0.0016***	0.0023***
fats	-0.0455**	-0.0244	-0.0278***	-0.0446
sgats	-0.0247	-0.0217	-0.0167***	-0.0254***
roet1	0.1650***	0.1603***	0.2222***	0.1669
_cons	24.8556***	24.9195***	19.5630***	25.2810***

legend: * p<.1; ** p<.05; *** p<.01

R^2	0.1588	0.0808	0.0642	-

Panel B: Regressions on MTBV and PER

MTBV

Variable	YearFE	IndustFE	Quant50	YearGEE
ino	0.0522	0.0476	0.0048***	0.0696
outo	0.0347	0.0464	-0.0013**	0.0473
pned	-11.7680	-9.2665	-0.3709***	-8.1712
dual	2.0465	-0.6660	-1.1784***	-0.2080
bsize	0.1393	-0.1844	0.0231***	-0.0865
tointens	28.4184	7.4274	-0.1331	12.9824
tdta	-0.1522*	-0.1475*	-0.0003	-0.1479
pvol	-0.2231	-0.2690*	0.0068***	-0.2677
ta	0.0000	0.0000	-0.0000***	0.0000
age	-0.0063	-0.0137	-0.0002	-0.0103
rndts	0.0028	0.0025	0.0020***	0.0029***
fats	0.0057	0.0051	-0.0034***	0.0063
sgats	-0.0114	-0.0081	-0.0002	-0.0132
mtbvt1	0.0098	0.0077	0.0062***	0.0098
_cons	12.9098	17.1582	2.1958***	15.0218

legend: * p<.1; ** p<.05; *** p<.01

R^2	0.1013	0.0256	0.0258	-

PER

Variable	YearFE	IndustFE	Quant50	YearGEE
ino	-0.2451	-0.2535	-0.0083	-0.3018
outo	-0.1947	-0.1587	0.0079	-0.0899
pned	75.1036*	77.8871*	3.6879***	89.4241***
dual	47.9509**	38.0787	11.7625***	44.4075***
bsize	-0.9879	-1.3753	-0.0354	-1.1342
tointens	-79.3909	-62.8189	-4.4859	-63.2596
tdta	0.0298	0.0894	-0.0251***	0.0440
pvol	0.3541	0.5239	-0.0032	0.3953
ta	-0.0000	-0.0000	-0.0000**	-0.0000
age	-0.2554	-0.2572	0.0014	-0.2306
rndts	-0.7048	-0.2953	0.0462	-0.6830
fats	-0.0012	-0.0542	0.0204***	-0.0484
sgats	0.4756*	0.4561*	0.0456***	0.4284
pert1	0.2670***	0.2671***	0.3946***	0.2675*
_cons	-10.5785	-14.1254	8.3881***	-23.8542

legend: * p<.1; ** p<.05; *** p<.01

R^2	0.1372	0.0524	0.0418	-

Note: YearFE is fixed effect regression for time differences; IndustFE is fixed regression for industry differences; Quant5 is median regression; and YearGEE is general equations estimation regression taking year as categorizing factor.
As indicated in the *legend:* * indicates significance at 10% level; ** indicates significance at 5% level; *** indicates significance at 1% level.

APPENDIX D: Annex to Chapter Five

Diagnostic Analyses of OLS Assumptions (Annex to Chapter Five)

5.5.5.1 OLS Regression Analysis

Table 5.6 presents the OLS regression of the explanatory variables on ROA for the VPC1-VPC2 version of the model. According to the *table*, VPC2 has significant negative relationship with ROA. Even though not presented here, the OLS results of *TDPI-SHAPV* and *C1C4-C2C3* confirm the same fact. Hence, the OLS regressions are inconsistent with confirming Lehman and Weidgand (2000) and Laevene and Levine (2008) and they do not support control contestability hypothesis. This questions the use of OLS regression method and one-equation model in revealing the control dominance-contestability in corporate control.

Table 5.6: OLS regression of control factors impact on ROA, regarding the VPC1-VPC2 version of the Model

roa	Coef.	t	P>t
pned	-2.175	-1.910	**0.056**
dual	-3.496	-6.170	**0.000**
vpc1	-0.040	-0.970	0.330
vpc2	-0.147	-2.240	**0.025**
abho	0.074	1.970	**0.049**
nbh	-0.405	-2.220	**0.026**
divps	1.040	1.700	**0.089**
fcfps	0.341	1.210	0.227
invincr	0.000	-1.790	**0.073**
tointens	6.712	1.870	**0.062**
tdta	-0.027	-2.530	**0.011**
pvol	-0.066	-3.180	**0.001**
eqto	0.380	1.850	**0.065**
roat1	0.236	11.690	**0.000**
_cons	9.738	7.760	**0.000**

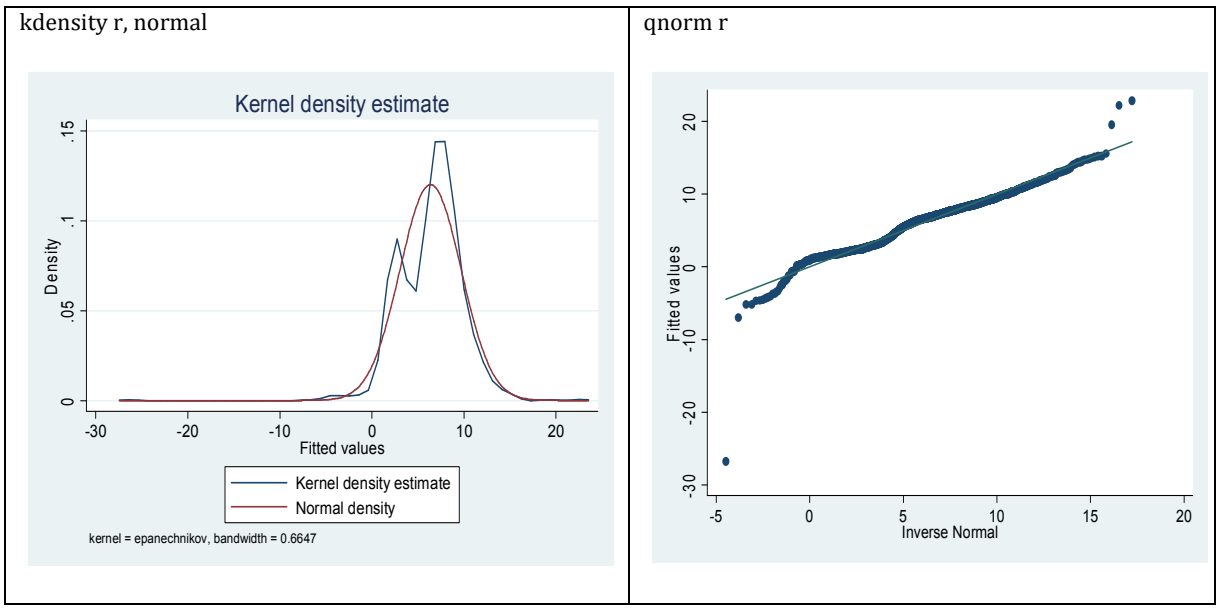
Note: The goodness-of-fit statistic are: N = 1819; F(2, 1804) = 24.57; Prob>F = 0.0000; R-squared = 0.1601; Adjusted R-squared = 0. 0.1536

Moreover, considering the general fit of the versions of the model, the R^2 of the four versions of the model are in the range of 0.1581 and 0.1601. The result of the OLS regression presented in the *table* below shows that R-squared is very low, and that only 16% of the variation in ROA are explained by the predictors, indicating that there might be omitted variables or correlations among the predictors or dynamic endogeneity problems. Finally, the simultaneous OLS multiple regressions of the five equation might not be free from the same shortcomings stated above. Hence, based on the arguments made above, it is indicative that OLS does not give us consistent unbaised estimators, and it would be important to make post estimation assumption checks or diagnostic analysis before deciding on the appropriate estimation method to be used for the SEM in this study.

5.5.5.2 Diagnostic Analysis

Tests for Normality: The kernel density distribution of the (**kdensity r, normal** command of STATA) in *figure 5.3* show that the distribution of the residuals is not normal since the kernel density is more peaked than the normal density. Additonally, the quartile plots (P-Plot and Q-plot, using the STATA commands **pnorm r** and **qnorm r**) show that there is sensitivity of the quartiles at both tails of the distribution, indicating non-normality. Hence, the graphical tests for normality show non-normality of the distribution of the residuals.

Fig. 5.3: Graphical tests for normality



Moreover, two numerical tests of normality are made. The first method uses the identification of the level of outliers to determine normality (*table 5.7, Panel A*). A programme written by Lawrence C Hamilton, Univeristy of New Hampshire, is downloaded using the **findit iqr** command and the the test is carried out using the STATA **iqr r** command. The result show that there are *mild outliers* are common in any data and are tolerable and are not of great concern.From the result, it is indicative that there are 2 sever outliers (1 low and 1 high), and that they accouunt for only an aggregate 0.1% of the observations. The test confirms that there are severe outliers, and hence, that normality assumption of residuals is violated.

The other numerical diagnostic method used to test normality is the *Shapiro-Wilk W test* for normality. Considering the assumption of the *W test* (*see table 5.7, Panel B*) that residuals are not normally distributed as a null hypothesis, the result (using STATA **swilk r** command) indicate that the residuals are not normally distributed since we accept the null hypothesis of non-normality. This test show that the NIID assumption of OLS regression is violated.

Table 5.7: STATA test for the identification of outliers and the determination of normality

Panel A: Interquartile range (IQR) test

```
. iqr r

    mean=   6.367           std.dev.=   3.321          (n= 1839)
  median=   6.828    pseudo std.dev.=   3.474        (IQR=   4.687)
 10 trim=   6.394
                                                    low          high
                                                    -------------------
                                  inner fences     -3.274        15.47
                             # mild outliers       13            3
                             % mild outliers       0.71%         0.16%

                                  outer fences      -10.3        22.51
                             # severe outliers     1             1
                             % severe outliers     0.05%         0.05%
```

Panel B: W test

```
. swilk r

                   Shapiro-Wilk W test for normal data

    Variable |    Obs       W           V         z       Prob>z
-------------+-------------------------------------------------
           r |   1839    0.95789     46.266     9.724    0.00000
```

Test for Homocedasticity of the Residuals: Both graphical and numerical methods are used to check for the homoscedasticity of the residuals. The graphical plot used in *figure 5.4, Panel A,* (produced by STATA **rvfplot, yline(0)** command) below seem to show that the variances are not homogeneous at both ends or tails. However, the tests for heteroscedasticity (*White's test* in IM-Test and the *Breusch-Pagan Test, see table 5.8*) that assumes variances are homoscedastic as null hypothesis, indicate that there is significant evidence to accept the null hypothesis from the higher p-values for the Chi-squared statistics. Hence, the variances of the residuals are *homoscedastic,* indicating that one of the NIID assumption is fulfilled and no worry for heteroscedasticity.

Fig. 5.4: Graphical test of heteroscedasticity

.rvfplot, yline(0)

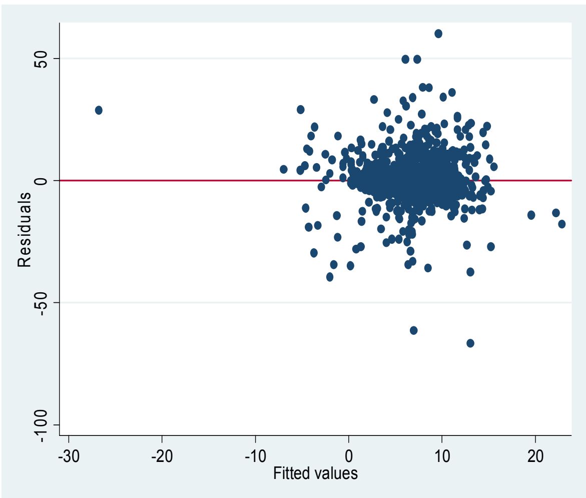


Table 5.8: Numerical test of heteroscedasticity

a) IM-Test, includes White's test of heteroscedasticity

```
. estat imtest

Cameron & Trivedi's decomposition of IM-test

              Source |       chi2     df      p
---------------------+-----------------------------
  Heteroskedasticity |     199.20    118    0.0000
            Skewness |       7.89     14    0.8952
            Kurtosis |       9.97      1    0.0016
---------------------+-----------------------------
               Total |     217.06    133    0.0000
```

b) Breusch-Pagan Test of heteroscedasticity

```
. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasti
         Ho: Constant variance
         Variables: fitted values of roa

         chi2(1)      =    22.73
         Prob > chi2  =   0.0000
```

Tests for Independence (Autocorrelation): Since the data is collected on the same variable over different time period and there might be similarities of subjects (firms) across industries, it is possible that the errors associated with one observation are correlated with the errors of any other observations. Since we use a panel data, we need to check for autocorrelation using Durbin-Watson test (**dwstat** command of STATA). The STATA output of Durbin-Watson test (*table 5.9)* show that the dw-statistic with 14 degrees of freedom (df) and 1840 observations (T) is 1.1429778. On the DW scale this lies to the left far below 2. The critical points lower dw (dl) and upper dw (du) for the last available degrees of freedom (df) and T on statistical table (14 and 1840 respectively) are 1.90941 and 1.93772 respectively. Hence, the dw-statistic is less than dl, thus, showing that we reject the null hypothesis that there is no autocorrelation. Since the dw-statistic falls between 0 and dl (*table 5.9, Panel B)* we have evidence that there is positive serial correlation at 5% significance level. Hence, the assumption of independence of residuals of the OLS is violated.

Table 5.9: STATA Durbin-Watson test for autocorrelation and the decision rule

Panel A: Durbin-Watson Test

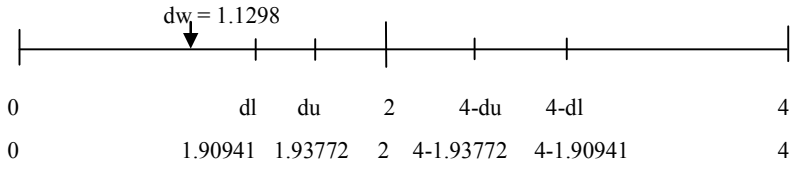
```
. dwstat

Number of gaps in sample:  775

Durbin-Watson d-statistic( 14,  1840) =  1.129778
```

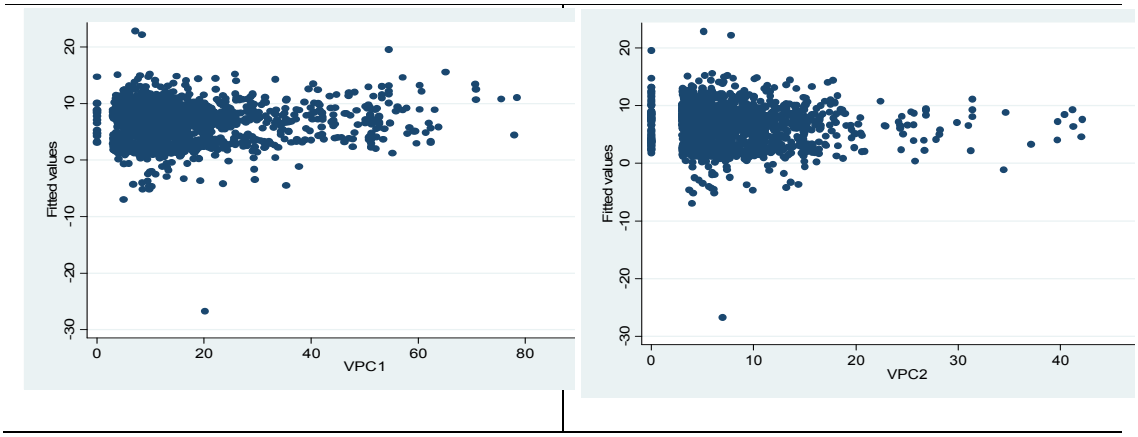
Panel B: Decision Rule on DW-statistic

Critical values at α=0.05 for (df=14, T=1850) = dl = 1.90941; du = 1.93772



Moreover, the checks made by using the graphical method for checking autocorrelation from STATA using the **scatter r** that plots the fitted values on the independent variables show that the residuals are not independent. This can be observed by the visual check of the pattern of the scatter plot for VPC1 and VPC2 that are presented as *figure 5.5.* So, the 2 methods confirm that the residuals have positive autocorrelation and there is no independence of residuals. This violates the NIID assumption of the OLS regression.

Fig. 5.5: Scatter plot of the fitted values on MONR



Tests for Linearity: Here it must be noted that we have a multiple OLS regression where several independent variables are involved. Hence, the check for linear relationship between the dependent variable and the independent variables cannot be straightforward. This check on individual independent variables shows that many of the variables show no clear departure from linearity. The STATA command **acprplot** that is used with **lowess lsopts(bwidth(1)),** which produces lowess smoothing with a bandwidth of 1**,** graphs an augmented component-plus-residual plot for the variables. The tests made on the major variables show linearity.

Fig.5.6: Tests for linearity on VPC1, VPC2, PNED and ABHO

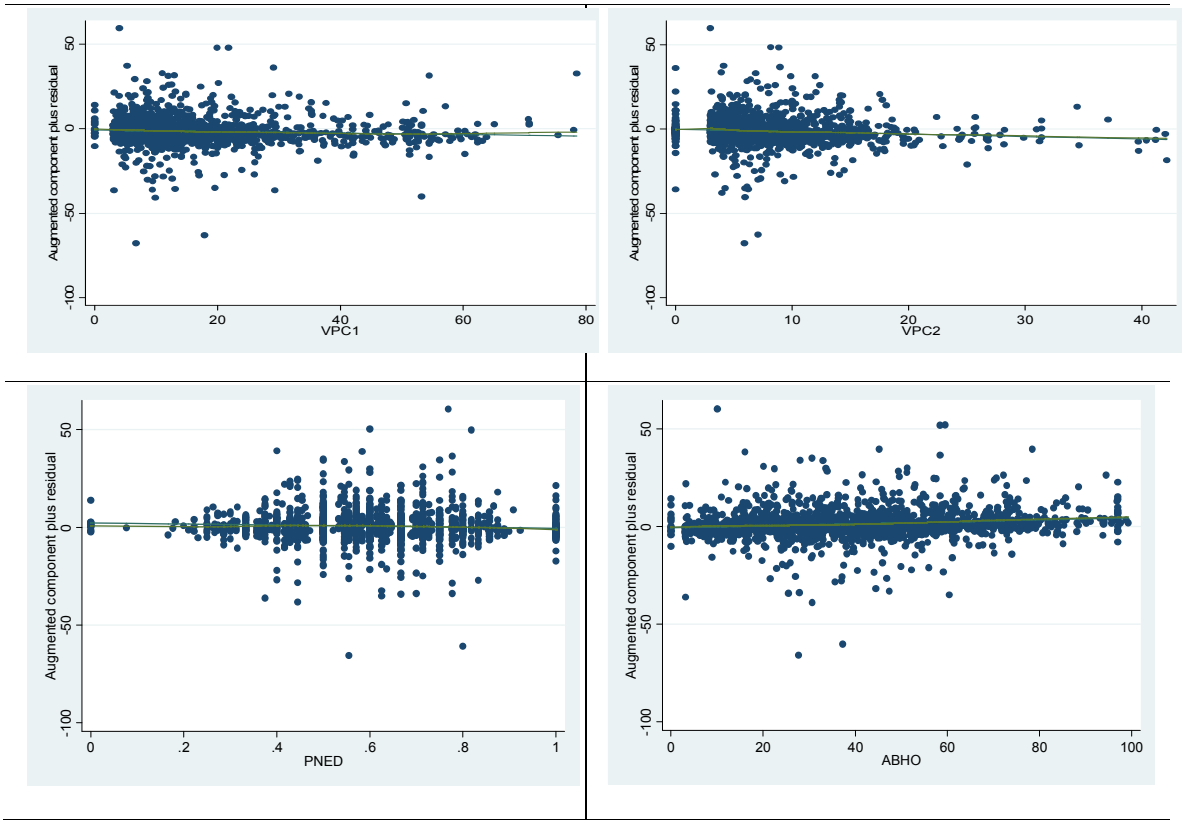


Figure 5.6 show that there is not any visual problem of nonlinearity for VPC1, VPC2, PNED and ABHO. The minor splitting gap at the end of VPC1 and PNED is not a big problem since there might be some few influential observations that cause divergence. So, we conclude that linearity assumption is fulfilled.

Tests for Multicollinearity: The correlation between different independent variables is checked since they may cause very high standard error, low t-statistic, and unexpected changes in the signs or magnitudes of coefficients even despite a high R-square. Even though STATA automatically drops perfectly collinear independent variables during regression, we might still need to examine for multicollinearity if collinearity by using pair-wise correlation and Tolerance and Variance Inflation Factor (VIF) methods.

The pair-wise correlation matrix (*see table 5.10*) of the independent variables show that there are pair of variables that show very high collinearity (more than 0.80). The pairs that exhibit high multicollinearity are TDPI and VPC1, C1C4 and VPC1, C1C4 and TDPI, and C2C3 and VPC2. The empirical model is designed so that the pairs are not used in the same equation for each version of the model by design; hence their multicollinearity is not a problem (*table 5.10*). Additionally, we know that PNED and DUAL are not a function of each other and hence, they do not have multicollinearity. The empirical model is designed so that the pairs are not used in the same regression equation. The board structure variables and external governance mechanisms are also found to have no serious multicollinearity problems.

Table 5.10: Pairwise correlation matrix of independent variables

	vpc1	vpc2	tdpi	shapv	c1c4	c2c3	monr	contr	abho	nbh	pned	dual	tointens	tdta	pvol	eqto
vpc1	1															
vpc2	0.40	1														
tdpi	0.86	0.28	1													
shapv	-0.07	0.58	-0.4	1												
c1c4	0.98	0.49	0.82	-0.01	1											
c2c3	0.34	0.95	0.20	0.55	0.47	1										
monr	0.44	-0.22	0.38	-0.22	0.33	-0.3	1									
contr	-0.35	0.27	-0.29	0.25	-0.34	0.26	-0.06	1								
abho	0.68	0.73	0.50	0.26	0.79	0.79	-0.16	-0.23	1							
nbh	-0.07	0.30	-0.17	0.23	0.08	0.45	-0.59	-0.12	0.59	1						
pned	0.02	-0.06	0.02	-0.04	0.00	-0.08	0.15	0.03	-0.08	-0.14	1					
dual	0.05	-0.04	0.04	-0.04	0.02	-0.06	0.13	0.00	-0.05	-0.15	0.60	1				
tointens	0.09	0.05	0.09	-0.01	0.10	0.06	0.01	-0.04	0.09	0.03	-0.26	-0.24	1			
tdta	-0.07	0.02	-0.05	0.03	-0.06	0.01	-0.07	0.05	-0.01	0.07	-0.14	-0.25	0.15	1		
pvol	0.09	0.19	0.01	0.15	0.13	0.21	-0.11	-0.05	0.21	0.17	-0.27	-0.30	0.12	-0.05	1	
eqto	-0.19	-0.08	-0.16	0.00	-0.17	-0.06	-0.13	0.08	-0.11	0.08	-0.15	-0.29	0.13	0.14	0.21	1

The examination of the problem of multicollinearity using the Tolerance and Variance Inflation Factor method *(table 5.11)* shows that only ABHO has a VIF greater than 10. The mean VIF in panel A where only the main variables are used in regression is 3.59. As it can be seen in panel B, when the control variables are included in the regression the men VIF is 3.19. Since the mean VIF in both cases is less than 10, we conclude that there is *no problem of multicollinearity* between the independent variables.

Table 5.11: Checks of VIF for test of multicollinearity

Panel A: SEM: VPC1-VPC2 variables

```
. vif
```

Variable	VIF	1/VIF
abho	19.38	0.051610
vpc1	7.87	0.127064
nbh	6.73	0.148496
vpc2	3.56	0.281177
dual	1.99	0.503399
pned	1.70	0.589929
pvol	1.30	0.768289
eqto	1.20	0.836196
tdta	1.16	0.862048
tointens	1.13	0.883608
divps	1.11	0.902945
roat1	1.09	0.919844
fcfps	1.02	0.981681
invincr	1.02	0.983785
Mean VIF	3.59	

Panel B: SEM: VPC1-VPC2 with control variables

```
. vif
```

Variable	VIF	1/VIF
abho	19.46	0.051377
vpc1	7.88	0.126928
nbh	6.75	0.148238
vpc2	3.57	0.280266
invincr	3.16	0.316790
ta	3.16	0.316842
dual	2.00	0.499563
pned	1.70	0.587513
pvol	1.36	0.737330
rndts	1.29	0.776231
sgats	1.23	0.813985
fats	1.23	0.814767
tdta	1.22	0.819880
eqto	1.20	0.833550
tointens	1.13	0.882411
roat1	1.11	0.900486
divps	1.11	0.901338
fcfps	1.08	0.921685
age	1.05	0.951317
Mean VIF	3.19	

Further examination into the problem using the Condition Index method using STATA post estimation **collin** command (*table 5.12*) shows that the *condition number*, namely, the index of the last variable (35.5160) is very high. Since the *condition number* is greater than the tolerable index (10), it can be stated that there is an indication problem of global stability due to the problem of multicollinearity in the model. Since the main contributors of non-stability are PVOL, EQTO and ROAT1, which contribute less VIF, we cannot conclude that there is a problem of multicollinearity.

Table 5.12: Diagnostics of collinearity using STATA Condition Index and Number method

```
Collinearity Diagnostics
```

Variable	VIF	SQRT VIF	Tolerance	R-Squared
pned	1.69	1.30	0.5910	0.4090
dual	1.99	1.41	0.5032	0.4968
vpc1	7.89	2.81	0.1268	0.8732
vpc2	3.56	1.89	0.2807	0.7193
abho	19.47	4.41	0.0514	0.9486
nbh	6.78	2.60	0.1474	0.8526
divps	1.11	1.05	0.9034	0.0966
fcfps	1.02	1.01	0.9806	0.0194
invincr	1.02	1.01	0.9839	0.0161
tointens	1.13	1.06	0.8836	0.1164
tdta	1.16	1.08	0.8632	0.1368
pvol	1.31	1.14	0.7660	0.2340
eqto	1.20	1.09	0.8360	0.1640
roat1	1.09	1.04	0.9186	0.0814
Mean VIF	3.60			

	Eigenval	Cond Index
1	8.4844	1.0000
2	1.1393	2.7290
3	1.0273	2.8739
4	0.9354	3.0118
5	0.7704	3.3186
6	0.6321	3.6637
7	0.5936	3.7806
8	0.3975	4.6200
9	0.3473	4.9427
10	0.2687	5.6192
11	0.1777	6.9106
12	0.1315	8.0325
13	0.0693	11.0676
14	0.0190	21.1128
15	0.0067	35.5160
Condition Number		35.5160

```
Eigenvalues & Cond Index computed from scaled raw sscp (w/ intercept)
Det(correlation matrix)    0.0106
```

To sum up, the multicollinearity checks using pairwise correlation and VIF method shows that there is no serious problem of multicollinearity between the predictors that are included in each equation. However, even though the collinearity diagnostics show the *condition number* is higher than 10, the tolerance level, and this indicates that there is problem of global stability, we conclude that there is not serious problem of collinearity based on the VIF result in *table 5.12*.

Model Specification Test: The model fit of the OLS regression is presented as *table 5.13* below. The *F-test statistic* test for the overall significance of the regression model is found to be significant. It shows that the model as a whole shows the relationship between the dependent and the independent variables. But it does not show how good the model is. From the low R-squared statistics (0.1601) there is an indication that there is some problem in the model. The adjusted R-squared is also lower even than R-squared. This problem might arise due to (1) omitted variable or included redundant variables, (2) multicollinearity between predictors that bias the contribution of the effect of predictors on the predicted variable, and (3) endogeneity where the predictors are related to the error term of the predicted variable.

Table 5.13: OLS model fit tests of the VPC1-VPC2 model

```
. regress roa pned dual vpc1 vpc2 abho nbh divps fcfps invincr tointens tdta pvol eqto roat1

      Source |       SS       df       MS              Number of obs =    1819
-------------+------------------------------           F( 14,  1804) =   24.56
       Model |  20043.6123    14  1431.68659            Prob > F      =  0.0000
    Residual |  105177.294  1804  58.3022692            R-squared     =  0.1601
-------------+------------------------------           Adj R-squared =  0.1535
       Total |  125220.906  1818  68.8783861            Root MSE      =  7.6356
```

Diagnostic checks show that multicollinearity is found to be not a serious problem, and this rules out our concern about the problem arising from it. Hence, the two other problems suspected might be the problem of endogeneity and misspecification (omitted variables and endogeneity. Since endogeneity problem might exist, as previously mentioned in our theoretical and empirical modelling, there is nothing we can do now except solving it by appropriate estimation method.

The remaining problem is model specification problem where we need to check for if there are omitted variables. In other words we check whether the variables included in the model are appropriate and/ or there are omitted variables that should have been included in the model. What is to be attempted is to avoid the exclusion of any relevant variable or the inclusion of any redundant or irrelevant variable. This procedure is vital because the model specification errors might result in inappropriate coefficient estimates and it is difficult to identify the actual contribution of the influence of each predictor on the independent variable. In an attempt made to add the firm specific control variables, R-squared increased a bit to 0.2015, which is still very low. Hence, we test for model specification using the original variables in the model.

In the STATA Linktest post estimation (**linktest** command) for single-equation models for the null hypothesis of *no specification error*, it is expected that the variables prediction (**_hat**) should be *significant* and the squared prediction (**_hatsq**) should be *insignificant* to indicate no omitted variables. The result of the test (*table 5.14)* confirms that both prediction and squared prediction are significant. Hence, there is *specification error* in the model.

Moreover, the Ramsey RESET test carried out by STATA **ovtest** command performs a regression specification error test (RESET) for omitted variables (Ramsey, 1969) creates new variables based on the predictors and refits the model using these new variables and checks if any of them are significant. The result of the test (*table 5.14, Panel B)* for null hypothesis of *no omitted variables* in the model shows that the F-test statistic is *significant,* and hence, we reject the null hypothesis. This

indicates that we have strong evidence to accept the null hypothesis of new model, implying that there have been omitted variables or specification error.

Both of the test methods used above indicate that the model is not specified correctly and there are omitted variables and we need to reconsider our model. However, including the

Table 5.14: STATA Linktest and Ramsey RESET test for model specification error (1)

Roa	coef.	t	P>|t|
_hat	0.8321	10.09	0
_hatsq	.01575	2.68	0.007
_cons	0.2564	0.65	0.518

Note: The goodness-of-fit statistic are: N = 1819; F(2, 1816) = 177.33; Prob>F = 0.0000; R-squared = 0.1634; Adjusted R-squared = 0.1625.

```
. ovtest

Ramsey RESET test using powers of the fitted values of roa
       Ho:  model has no omitted variables
                 F(3, 1801) =      14.78
                   Prob > F =      0.0000
```

firm-specific variables into the model show that the *linktest* show that the prediction (**_hat)** is significant and but the squared prediction (**_hatsq)** is insignificant indicating that the *model is correctly specified* (*table 5.15)*. But the *Ramsey test* still shows that the model is not correctly specified. The test results of the two methods lead us to opposite conclusions.

Table 5.15: STATA Linktest and Ramsey RESET test for model specification error (2)

Roa	coef.	t	P>|t|
_hat	1.000642	21.44	0
_hatsq	.0038338	1.64	0.101
_cons	-.2127356	-0.58	0.563

Note: The goodness-of-fit statistic are: N = 1819; F(2, 1816) = 230.87; Prob>F = 0.0000; R-squared = 0.2027; Adjusted R-squared = 0.2018.

```
. ovtest

Ramsey RESET test using powers of the fitted values of roa
       Ho:  model has no omitted variables
                 F(3, 1796) =      9.36
                   Prob > F =      0.0000
```

Nevertheless, it is understandable that there might be omitted variables when we investigate the determinants of firm performance using a panel data since it is suggested that there might be several firm- or industry-specific unobserved heterogeneity (Himmelberg et al., 1999) besides the macroeconomic shocks that impact firm performance. However, relying on the later *linktest* results, it might be appropriate to retain the model as correctly specified.