UNIVERSITY OF SOUTHAMPTON

FACULTY OF BUSINESS, LAW AND ART

Southampton Business School

Corporate Governance, Firm Performance and Efficiency:

Three Empirical Analyses of the UK Insurance Industry

by

Tony Abdoush

Thesis for the degree of Doctor of Philosophy

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ABSTRACT

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CORPORATE GOVERNANCE, FIRM PERFORMANCE AND EFFICIENCY: THREE EMPIRICAL ANALYSES OF THE UK INSURANCE INDUSTRY

Tony Sameer Abdoush

The purpose of this thesis is to investigate the impact of corporate governance and distribution strategies on firm performance, following the regulatory changes since 1980s, the technological advances, and the customer preferences' volatility in the UK insurance industry, in order to explore how insurance companies survive in such a changeable environment.

The aim of the first core chapter is to examine the impact of various corporate governance arrangements on the performance of UK life and non-life insurance firms, both listed and non-listed, during the period 2004-2013. The main findings show that longer tenure length and an extra bonus ratio with higher ownership ratio for executives, but a shorter tenure length for independent non-executives, improves firm performance in insurance companies. Furthermore, the findings for the sub-samples indicate the association between corporate governance and firm performance in non-life and listed insurance companies, during the financial crisis of (2007-2009), and even more afterwards, as well as during the soft phases of the underwriting insurance cycle, rather than the hard phases.

The objective of the second core chapter is to assess whether the newly built UK Corporate Governance Index (UKCGI), which has been developed by the researcher, indicates any association between governance structure and firm performance in the UK life and non-life insurance companies, both listed and non-listed, during the period 2004-2013. Moreover, this study investigates the mediating role of agency costs on the relationship between corporate governance and the performance of UK insurance companies. The main findings indicate a significant association between the new corporate governance index (UKCGI) and firm performance, and that the governance-performance relationship is fully mediated by agency

costs, suggesting that corporate governance does help to reduce agency costs, which in turn leads to improved firm performance.

Finally, since the choice of distribution channels can determine the success of an insurer and significantly affect its profitability in related markets, the third core chapter compares the efficiency of distribution strategies, whether single or multi-channel, that life and non-life insurance companies, both stock and mutual, implemented in the UK during the period 2004-2013. It then examines the extent to which the choice of a specific distribution strategy, namely independent agents as a complementary corporate governance system, improve firm efficiency, by reducing agency conflicts between policyholders and managers and shareholders. The main findings show that multi-channel insurers have higher scale efficiency compared to other single strategies, in which they have almost reached their optimal size to operate efficiently and utilise their strengths. In the second stage, the association between corporate governance, estimated by the researcher's newly built corporate governance index (UKCGI), and firm efficiency, measured by the data envelopment analysis (DEA), has been fully confirmed in stock companies. On the other hand, the results also show that independent agency strategy does play a vital role as a complementary corporate governance system, with strong evidence for stock companies, but weaker evidence for mutuals.

Table of Contents

List of Tables

List of Figures

DECLARATION OF AUTHORSHIP

I, ... Tony Abdoush

declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

"Corporate Governance, Firm Performance and Efficiency: Three Empirical Analyses of the UK Insurance Companies".....

.....

I confirm that:

1. This work was done wholly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. Parts of this work have been published as:

   Abdoush, T., Wolfe, S. and Marshall, A. (2016) "*Does Corporate Governance affect the Performance of Insurance Firms in the UK?*" British Academy of Management Conference (BAM2016), University of Newcastle, Newcastle, UK
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   [Developmental Paper]

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   [Developmental Paper]

Signed: Tony Abdoush .....

Date: 23/01/2017 .....

DEDICATION

This thesis is dedicated…

To my beloved wife, **Rasha**, and my adorable daughters, **Matilda** & **Selina**

You have been always a constant source of love, care, understanding, support and encouragement during the challenges of this long journey…

I am truly thankful for having you in my life…

To my parents, **Sameer** and **Ferial**

You have always loved me unconditionally, prayed for me, taught me to work hard for the things that I aspire to achieve, and successfully made me the person I am becoming…

I can only say, inadequately, thank you...

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Last, but not least, I would like to thank all of my wonderful friends and colleagues, not mentioned above, for their encouragement and emotional support in many different ways.

Needless to say, none of the special people mentioned here share any responsibility for errors of fact or judgment that may have occurred in this work.

Tony Sameer Abdoush
Southampton, UK
October 2016

Definitions and Abbreviations

Abbreviation	Description
CG	Corporate Governance
FRC	Financial Reporting Council
FCA	Financial Conduct Authority
PRA	Prudential Regulation Authority
EEA	European Economic Area
LSE	London Stock Exchange
ABI	Association of British insurers
NED	Non-Executive Directors
INED	Independent Non-Executive Directors
ED	Executive Directors
CEO	Chief Executive Officer
ROA	Return on Assets
ROE	Return on Equity
OLS	Ordinary Least Squares
VIF	Variation Inflation Factor
UKCGI	UK Corporate Governance Index
TCL	Corporate Library's Board Effectiveness Ratings
GMI	Governance Metrics International
CLSA	Credit Lyonnais Securities Asia
ISS	Institutional Shareholder Services' CGQ rating
KCFI	Korean Corporate Governance Index
MNEs	Multi-National Enterprises
DEA	Data Envelopment Analysis
SFA	Stochastic Frontier Analysis
DMUs	Decision-Making Units
CE	Cost Efficiency
AE	Allocative Efficiency
TE	Technical Efficiency
PTE	Pure Technical Efficiency
SE	Scale Efficiency
RTS	Return-to-Scale
CRS	Constant Return-to-Scale, known as DEA-CCR Model
VRS	Variable Return-to-Scale, known as DEA-BCC Model
FSA	Financial Services Authority
FSMA	Financial Services and Markets Act

Abbreviation	Description
DTI	Department for Trade and Industry
RDR	Retail Distribution Review
IFAs	Independent Financial Advisors

Chapter 1

Introduction

Chapter 1: Introduction

1.1 Research Focus, Aim and Questions

The main purpose of this research was to investigate the impact of corporate governance and distribution strategies on firm performance in the insurance industry, following the regulatory changes since 1980s, the technological advances, and the customer preferences' volatility in the UK insurance industry, in order to explore how insurance companies survive in such a changeable environment. This has been accomplished and is presented in the form of the three core chapters (Chapter 2, 3 and 4) of this thesis, using a sample of 67 UK listed and non-listed firms, selling life, non-life, or both insurance products, over the period 2004-2013.

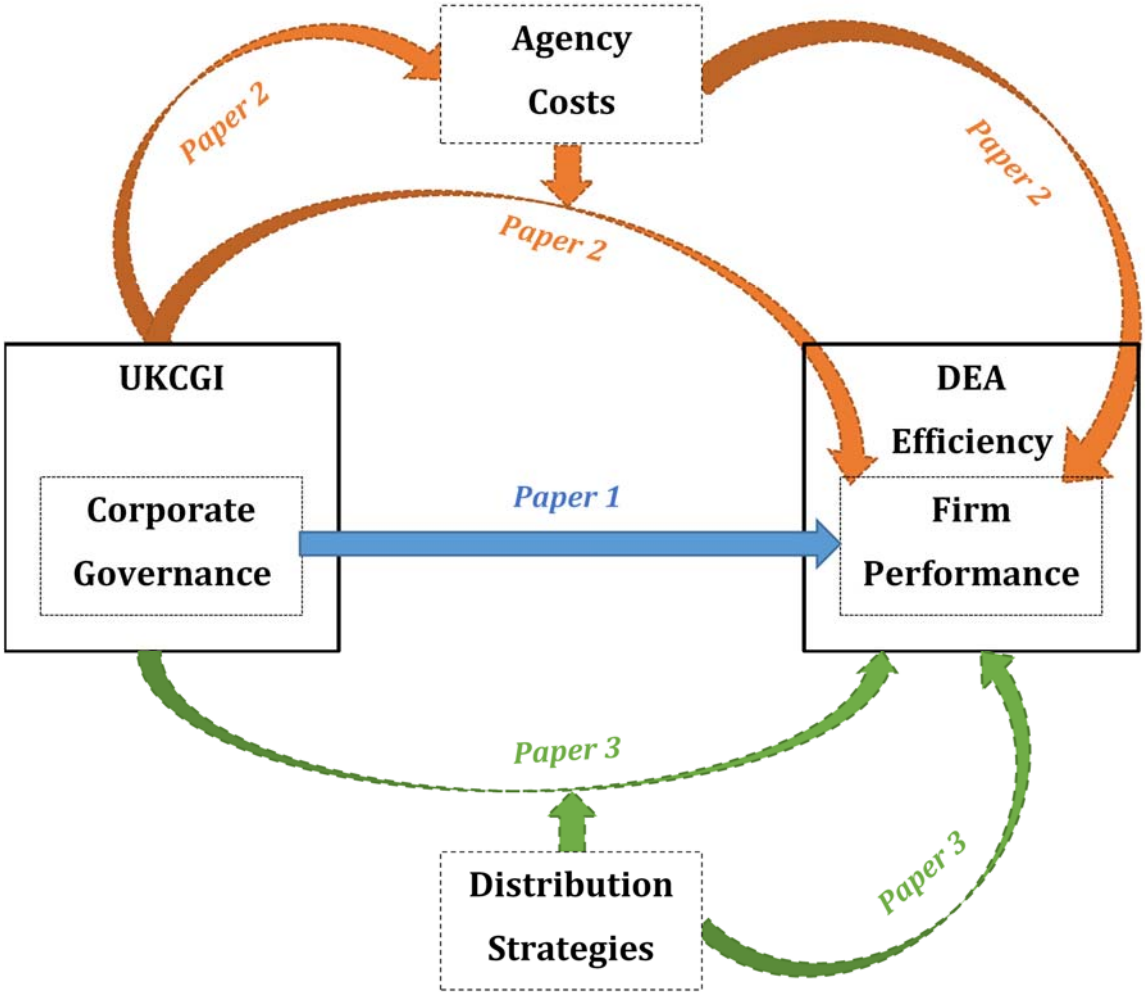

Figure 1-1: Thesis Framework

*(**Source**: the researcher's interpretation of the suggested three-stage framework of the whole PhD thesis on the relationship between corporate governance, distribution strategy and performance in the UK insurance industry.*

The figure above (*Figure 1-1*) is an illustration of the suggested framework of the relationship between corporate governance, distribution strategy and performance in the UK insurance industry. The research aim and questions are presented below for each of the core chapters in turn.

The aim of the first core chapter (Chapter 2) is to examine the impact of various corporate governance arrangements on the performance of UK life and non-life insurance firms, both listed and non-listed, during the period 2004-2013. A second objective is to give insight into the effectiveness of corporate governance practices used prior to, throughout, and following, the Financial Crisis of (2007-09), as well as taking into account the underwriting insurance cycle[1].

While much academic research has been done on corporate governance in large non-financial companies, (Short and Keasey, 1999; Core, Holthausen and Larcker, 1999; Bhagat and Bolton, 2008; Anderson and Gupta, 2009; Munisi and Randøy, 2013; Andreou, Louca and Panayides, 2014; Yoo and Jung, 2014), less research has focused on financial firms in which the banking industry has been the main focus (Olatunji and Stephen, 2011; Aebi, Sabato and Schmid, 2012; Dedu and Chitan, 2013). However, there has been only a limited amount of empirical research into corporate governance practices across publicly quoted insurance companies, (Wang, Jeng and Peng, 2007; Boubakri, 2011; Huang *et al.*, 2011), with a few exceptions in the UK, which have focused on life sector only. For instance, Diacon and O'sullivan (1995) examined the impact of a variety of governance arrangements on the performance of UK life insurance firms.

To sum up, the first core chapter tries to answer the following research questions:

1. ***Does corporate governance affect the performance of insurance firms?***
2. ***Which particular corporate governance arrangements are more important in affecting firm performance?***
3. ***Have insurance line, listing, underwriting cycle, and the recent financial crisis of 2008, changed the relationship between corporate governance and firm performance?***

The objective of the second core chapter (Chapter 3) is to assess whether the newly built UK Corporate Governance Index (UKCGI), which has been developed by the researcher, indicates any association between governance structure and firm performance in the UK life and non-life insurance companies, both listed and non-listed, during the period 2004-2013. Moreover,

[1] The features of a soft insurance market are lower premiums, broader coverage, easier underwriting, more policies, and increased competition among insurers, while in the hard market, the premiums are higher with more strict underwriting criteria, fewer written policies and less competition as well (English, 2013).

this study investigates the mediating role of agency costs on the relationship between corporate governance and the performance of UK insurance companies.

A corporate governance index for the UK insurance companies has yet to be found, due to the shortcomings of other ratings (see Bhagat and Bolton, 2008; Daines, Gow and Larcker, 2010; Schnyder, 2012; Bozec and Bozec, 2012). This will be discussed in the chapter 3. Moreover, to the best of the researcher's knowledge, only two previous studies have investigated the mediating effect of agency costs on the governance-performance relationship as indicated by agency theory (see Le and Buck, 2011; Huang, Wang and Wang, 2015), although both studies have used individual corporate governance arrangements, and focused on either listed companies (Le and Buck, 2011) or non-financial firms (Huang, Wang and Wang, 2015).

To sum up, the second core chapter tries to answer the following research questions:

1. ***How sensitive is firm performance to the corporate governance rankings of Insurance companies in the UK, produced using our new UK Corporate Governance Index (UKICGI)?***
2. ***Do agency costs mediate the relationship between corporate governance and firm performance?***

Finally, since the choice of distribution channels can determine the success of an insurer and significantly affect its profitability in related markets, the third core chapter (Chapter 4) compares the efficiency of distribution strategies, whether single or multi-channel, that life and non-life insurance companies, both stock and mutual, have implemented in the UK during the period 2004-2013. It then examines the extent to which the choice of a specific distribution strategy, namely independent agents, as a complementary corporate governance system, improve firm efficiency, by reducing agency conflicts between policyholders and managers and shareholders.

Most previous studies have examined the effect of specific distribution channels on the performance of insurance companies, mainly two channels; independent financial advisors (IFAs) and exclusive agents (see Berger, Cummins and Weiss, 1997; Klumpers, 2004; Trigo-Gamarra, 2008; Park, Lee and Kang, 2009). Few studies, however, have tried a more comprehensive approach by investigating how effective is the combination of distribution channels used in a specific company on the performance of such company (Easingwood and Coelho, 2003; Coelho and Easingwood, 2004; Trigo-Gamarra and Growitsch, 2008; Easingwood and Coelho, 2010; Trigo-Gamarra and Growitsch, 2010). For example, a study by (Trigo-Gamarra and Growitsch, 2010) recognised three types of distribution strategies, a multi-channel strategy and two single-channel strategies, which are direct distribution without the use of salespersons, and independent intermediaries. Moreover, most previous studies of the association between distribution strategies and firm performance have been implemented in the USA (Kim, Mayers and Smith, 1996; Park, Lee and Kang, 2009), with a few others in

European companies, such as Germany (Trigo-Gamarra and Growitsch, 2008; Trigo-Gamarra and Growitsch, 2010), while fewer studies in the UK have focused on one insurance line only, either life or non-life, such as (Webb and Pettigrew, 1999; Ward, 2003; Klumpers, 2004; Kumar, 2009).

On the other hand, corporate governance is considered to be a key factor to improve performance, thereby facilitating growth in insurance companies, as it promotes accountability, enhances transparency, improves profitability and, finally, protects stakeholders' interests (Babu and P.Viswanatham, 2013). In this regard, some studies have investigated the impact of corporate governance on firm efficiency, mainly in the USA (Huang, Hsiao and Lai, 2007; Huang *et al.*, 2011), with fewer in the UK (Hardwick, Adams and Zou, 2003). However, to the best of the researcher's knowledge, only two studies have examined the link between corporate governance, distribution strategies and firm performance. Both studies investigated the effect of independent intermediaries as a mode of corporate governance to help control the insurers' opportunistic behaviour against policyholders. The first study used 1981 data from the A. M. Best Company for 1,480 property-liability insurance companies in the USA (Kim, Mayers and Smith, 1996), while the second one used data for 42 life insurance companies over the period 1990-1997 in the UK (Ward, 2003).

To sum up, the following research questions will be answered in the third core chapter:

1. ***Does the choice of distribution strategy affect the efficiency of insurance firms?***
2. ***To what extent would the choice of distribution strategy improve corporate governance good practices, leading to enhanced efficiency?***

1.2 Background and Research Motivations

1.2.1 Overview of the UK Insurance Market

The UK Insurance market is the third largest in the world after the US and Japan, and it is the largest in Europe, with around fifth of the total European gross written premiums, and around quarter of the total European benefits and claims paid (Hardwick and Guirguis, 2007; Kumar, 2009; ABI, 2012; ABI, 2013; ABI, 2014; Swiss Re, 2014; ABI, 2015; Insurance Europe, 2014). It is also an important contributor to the UK economy, managing £1.9trn in investments during 2014[2] (£1.8trn in 2013), paying £11.8bn in taxes (£10bn in 2013), contributing around 12% to UK GDP in 2013, and a major employer hiring around 334,000 individuals (315,000 in 2013), of which around a third are employed directly by insurers, with the remainder in auxiliary services (Insurance Europe, 2014; ABI, 2014; ABI, 2015). UK insurance companies are

[2] Available from the latest version of the annual report: UK Insurance – Key Facts (2015), released by Association of British Insurers (ABI).

organized on either a stock or mutual basis, in which stock companies[3] are owned by shareholders, while mutual companies[4], on the other hand, are owned entirely by their policyholders[5] (see Diacon and O'sullivan, 1995; Ward, 2003; NAIC, 2015; Hardwick and Guirguis, 2007). Both the UK life[6] and non-life[7] insurance sectors are dominated by stock companies, with mutual companies' share of the total UK insurance market being less than 8% (increased from 4.4% in 2007 to 7.7% in 2014) (ICMIF, 2015). According to ABI (2014), The UK general insurance industry received worldwide net premiums of £50.2bn and paid out claims of £32.1 in 2013, while the UK life insurance industry received worldwide net premiums of £160.4bn and paid out benefits of £191.2bn in the same year (see also Insurance Europe, 2014 [Numbers in €m]).

1.2.2 Corporate Governance and Agency Conflicts

Most concerns about corporate governance[8] stem originally from the separation of ownership from control which began in the 1930's (Jensen and Meckling, 1976), but they gained increased attention in the UK after the major corporate scandals and financial frauds of the 1980s, leading to the establishment of the 'Financial Aspects of Corporate Governance' Committee in 1991, which issued the Cadbury Report in 1992[9] (Cadbury, 1992; Diacon and O'sullivan, 1995; FRC, 2012a; FRC, 2012b; Babu and P.Viswanatham, 2013; FRC, 2014; FRC, 2016). Following the Cadbury report (1992), subsequent reports, promoted by the continuing shareholder disquiet over the governance structure and the response to poor performance, have offered recommendations to improve the practice of corporate governance in the UK (ICSA, 2009; FRC,

[3] Both publicly quoted and privately owned.

[4] Includes mutual insurance companies, cooperative insurance companies, friendly societies, not-for-profit insurers, discretionary mutuals, and also limited companies majority-owned by mutual, cooperative, charitable or non-profit organisations.

[5] Any profits earned are returned to policyholders in the form of dividend distributions or reduced future premiums (NAIC, 2015).

[6] Life insurance and long-term savings includes pensions, annuities, investments, savings and protection policies, which are used to provide an income during retirement and provide for individuals and their families following an accident, illness or a death in the family (ABI, 2014).

[7] General or non-life insurance includes motor, property, accident, health, liability, pet insurance and other specialist lines, which play an import role in UK society, as well as helping business to cope with unforeseen events and to recover more effectively (ABI, 2014).

[8] Corporate governance was defined by Sir Adrian Cadbury as "the system by which companies are directed and controlled" (Cadbury, 1992, p15), and includes a set of guidelines and procedures that define the relationship between the board of directors, managers, shareholders and other stakeholders, in order to improve the performance of those companies in the long-term (Cadbury, 1992; Diacon and O'Sullivan, 1995; OECD, 2004; Boubakri, 2011; FRC, 2014).

[9] In December 1992, the Cadbury Committee, established by the Financial Reporting Council (FRC), the London Stock Exchange and the accountancy profession and, chaired by Sir Adrian Cadbury, issued the first report on the quality and objectives of corporate governance in the UK, underlining the link between governance structure and performance (Cadbury, 1992; Diacon and O'sullivan, 1995). Later, in 1994, the principles were appended to the listing rules of the London Stock Exchange although companies were free to comply or not with those principles. Subsequent committees have brought further changes to the existing principles and recommendations in the Cadbury Code, namely, the Greenbury Committee (1995), the Hampel Committee (1998), the Turnbull Committee (1999), and Sir Derek Higgs (2003) (see ICSA, 2009). From 2003, The FRC has been responsible for the Combined Code, and reviews the Code regularly. In response to the global financial crisis 2007-09, the David Walker Review (2009) included recommendations for all companies, although it focused mainly on the banking industry. In 2010, the Financial Reporting Council issued a new Stewardship Code, along with a new version of the 'UK Corporate Governance Code' [the Code]. The latest UK Corporate Governance Code was released in April 2016. (FRC, 2016).

2003; FRC, 2006; FRC, 2008; FRC, 2010; FRC, 2012b; FRC, 2014). The latest update, 'The UK Corporate Governance Code', was released in April 2016 (FRC, 2016).

Unlike the regulation-based approach taken in the United States, known as 'Sarbanes-Oxley' legislation 2002, the UK code is based on a unique voluntary approach, 'Comply or Explain', which means that companies are required either to comply with its principles and guidelines, or to explain the reasons for non-compliance (Rayton and Cheng, 2009; FRC, 2012a; FRC, 2003; FRC, 2006; FRC, 2008; FRC, 2010; FRC, 2012b; FRC, 2014; FRC, 2016). Such flexibility has encouraged companies to commit to corporate governance and comply with the code, although some companies follow only the letter, rather than the spirit, of the code requirements, and provide the same weak explanation for non-compliance until they are compliant (FRC, 2007; Arcot, Bruno and Faure-Grimaud, 2009), which might explain why not all companies have achieved good corporate governance (Chen *et al.*, 2007) and, thus, the need for a rating score to measure the compliance in the UK.

Traditionally, corporate governance has been associated with the agency problem, in which the principals (shareholders) use the agents (managers) to run companies in their interests (the principals) (Diacon and O'sullivan, 1995; Mayer, 1997; Dharwadkar, George and Brandes, 2000; Mallin, 2004; Huang *et al.*, 2011). Thus, corporate governance provides the key mechanisms needed to monitor and restrict managers' opportunistic behaviour, and align the interests of managers and shareholders, and other stakeholders as well, leading to reduced agency costs, and improved performance (Fama and Jensen, 1983; Shleifer and Vishny, 1986b; McKnight and Weir, 2009). In this regard, the implementation of good practices for corporate governance has become of high significance for investors when making investment decisions (Core, Holthausen and Larcker, 1999; Barrett, Todd and Schlaudecker, 2004; Kao, Chiou and Chen, 2004; Epps and Cereola, 2008), since good governance structure would help to reduce agency conflicts, and improve firm performance.

1.2.3 Regulatory Changes in the UK Insurance Market

Regarding the development of the regulatory structure facing insurance companies in the UK, a series of Acts of Parliament have early recognized the need for regulations to protect policyholders, such as The Insurance Companies Act (1974), and 1982 Act, which brought in minimum solvency margins and defined conditions for an insurer to be authorised to transact business in the UK (Hardwick and Guirguis, 2007). Later on, the Financial Services and Markets Act 2000 (FSMA) completed the formal process to replace the eight existing financial services regulators before 1997, through the Department for Trade and Industry (DTI) to the HM Treasury in preparation for the move to the Financial Services Authority (FSA) in 2001

(Hardwick and Guirguis, 2007; Ford, 2012). The FSA regulation has involved both prudential requirements and controls over the conduct of businesses, with the financial stability being added later by the Financial Services Act 2010, rather than public awareness, as a key objective of the revised regulatory regime post-2009 financial crisis (The Investment Association, 2012; Ford, 2012; Rawlings, Georgosouli and Russo, 2014). Thereafter, the UK government announced the planned break-up of the FSA by the Financial Services Act 2012, whereby the prudential supervision of banks and insurers has been transferred to the Prudential Regulatory Authority (PRA), a new subsidiary of the Bank of England, while the FSA has been re-named as the Financial Conduct Authority (FCA), introducing more intrusive supervision (Ford, 2012; The Investment Association, 2012; Rawlings, Georgosouli and Russo, 2014). On the other hand, as a member of the European Union, the UK is also subject to the directives issued by the European Parliament (Hardwick and Guirguis, 2007). Recently, new regulations, such as the Retail Distribution Review (RDR) and the Gender Directive (Horn, 2014), which took effect from the first of January 2013, have also affected insurance companies.

1.2.4 Distribution in the UK Insurance Market

Distribution is one of the key success factors for the insurance business, in which the choice of distribution channels, according to Klumpers (2004); Brockett *et al.* (2005), can affect profitability and, thus, determine the success of an insurer in related markets. Insurance companies have utilised several distribution channels to sell insurance, with an increasing number of insurers using a combination of different channels to distribute their products efficiently (Easingwood and Coelho, 2003; Trigo-Gamarra and Growitsch, 2008; Trigo-Gamarra and Growitsch, 2010). According to O'shaughnessy (1995, p639); O'shaughnessy (2014)), a distribution channel can be defined as "the network of people, institutions or agencies involved in the flow of a product to the customer, together with the informational, financial, promotional and other services associated with making the product convenient and attractive to buy and rebuy". In the UK, changes in distribution channels have been mainly driven by regulatory developments, technological advances, the emergence of new competitors as well as fluctuations in consumer demand and preferences (Webb and Pettigrew, 1999; Klumpers, 2004; Insurance Europe, 2014).

Since the deregulations in the mid-1980s, insurance companies have been increasingly providing insurance ranging from simple to more complex products, (Webb and Pettigrew, 1999), whereas managerial discretion is needed in order to timely seize any profitable opportunity that might emerge (Ward, 2003). Therefore, insurance companies face three different agency conflicts, according to (Ward, 2003), in which shareholders have to monitor and control managers for opportunistic behaviour, and policyholders have to prevent

exploitation by shareholders, in addition to the emerging conflict between insurers and the agent (distribution channel). According to (Mayers and Smith, 1981), stock companies are better at mitigating shareholder-manager agency costs, while agency costs between shareholders and policyholders are best solved by mutual companies. However, insurance companies will introduce complementary governance systems[10] (Milgrom and Roberts, 1995) if such systems help to reduce the overall agency costs between shareholders, managers, agents and policyholders, which cannot be mitigated using the basic corporate governance system (Ward, 2003).

1.2.5 Research Motivations

To sum up, in addition to its importance for the whole UK economy, the UK insurance industry has been selected in this study for several reasons. Namely, the extensive regulatory changes following deregulation of the UK financial services sector in the mid-1980s, technological advances, increased competition from other financial, and even non-financial companies, and customers' volatility, which also led to changes in distribution channels.

On the other hand, corporate governance has been selected due to the continuing shareholder disquiet over the governance structure and the response to poor performance after the major corporate scandals and financial frauds of the 1980s, leading to the establishment of the UK Corporate Governance Code (1998, 2003, 2006, 2008, 2010, 2012, and 2014). The unique voluntary approach of the UK corporate governance code, 'Comply or Explain', has made the UK a 'unique' corporate governance environment, in which most governance studies undertaken in the US would not be applicable in the UK context.

Indeed, investors, i.e. shareholders, have increased their focus on corporate governance when making investment decisions, as good governance structure would help to reduce agency conflicts, and improve firm performance. With this regard, insurance companies face three different agency conflicts, in which shareholders have to monitor and control managers for opportunistic behaviour, and policyholders have to prevent exploitation by shareholders, in addition to the emerging conflict between insurers and the distribution channel. Thus, insurance companies would use complementary governance systems, such as participating policies and distribution strategy, which help to reduce the overall agency costs between shareholders, managers, agents and policyholders.

[10] As defined by (Milgrom and Roberts, 1995), two activities are considered strategic complements if doing more of one activity increases the marginal profitability of the other activity.

1.3 Research Contributions

This thesis complements other studies and contributes to the existing literature on corporate governance in a number of ways. The first contribution is the creation of a manually collected dataset for insurance companies in the UK, over a longer period of time stretching between 2004 and 2013. Secondly, it provides a new evidence for the impact of various corporate governance arrangements on three different proxies of firm performance, including a new insurance-related variable, the adjusted combined ratio. Thirdly, it also gives important empirical insight into the effectiveness of corporate governance practices prior to, throughout, and following the Financial Crisis of (2007-09), taking into account the underwriting insurance cycle in a sample of life, non-life and composite insurance companies, both listed and non-listed. Fourthly, unlike other commercial and academic rating scores, this current study established a new composite measure of 35 CG statements, broken down into five sub-indices, based mainly on the UK Corporate Governance Codes of 2003 – 2012 (FRC, 2003; FRC, 2006; FRC, 2008; FRC, 2010; FRC, 2012b), as well as the Corporate Governance Guidance and Principles for Unlisted Companies in the UK (IoD, 2011). This study has shown that the newly built corporate governance index (UKCGI) reflects a positive association between the corporate governance and firm performance. Fifthly, this thesis is the first, as far as the researcher is aware, to investigate the mediating role of agency costs, based on the asset turnover ratio, on the relationship between corporate governance, using an aggregated corporate governance measure (i.e. UKCGI) rather than individual CG arrangements, and firm performance. Sixthly, this thesis provides new empirical contributions to existing studies by investigating the impact of single and multi-channel strategies on firm efficiency, while most prior studies have focused on the most popular distribution systems, exclusive agents and independent agents, and only one study has compared the efficiency of multi-channel strategy with direct and independent strategies separately (see Trigo-Gamarra and Growitsch, 2010). Finally, this thesis provides an evidence of significant positive relationship between the newly built corporate governance index (UKCGI) and the firm efficiency scores, suggested that independent agents are more efficient, compared to other distribution strategies, in mitigating the agency conflicts, leading to further improved efficiency in the insurance industry, with strong evidence for stock companies, but weaker evidence for mutuals.

1.4 Structure of the Thesis

This chapter has presented the main focus of the whole thesis, and the research aims, objectives and questions of the three core chapters of this thesis. The background and rational of this thesis have been discussed, and highlights the motivation and specific research questions for each core chapter. The remainder of the thesis continues as follows. Chapters 2, 3 and 4 present the three core chapters mentioned above, which answer the following questions: Does Corporate Governance affect the Performance of Insurance Firms in the UK? (Core Chapter 1); The Development of a Corporate Governance Index for UK Insurance Firms, A Necessary Panacea? (Core Chapter 2); and finally, The Choice of Distribution Strategy as a Complementary Corporate Governance System, Does it work? (Core Chapter 3). Each core chapter includes an introduction, literature review, data and methodology, data analysis and discussion, and conclusion sections. Chapter 5 is the final chapter and provides a summary of the key research findings of the three core chapters, highlights the whole thesis contributions, underlines the thesis limitations and, finally, offers policy recommendations as well as some suggestions for further research.

Chapter 2

Does Corporate Governance affect the Performance of Insurance Firms in the UK?

Chapter 2: Does Corporate Governance affect the Performance of Insurance Firms in the UK?

Abstract

The aim of this chapter is to examine the impact of corporate governance on the firm performance of 67 UK insurance firms during the period 2004-2013. The sample starts in 2004 after the Financial Reporting Council (FRC) released the UK corporate governance code in 2003, and ends in 2013, since it was the most recent year for which data was available at the time of data collection. As far as the researcher is aware, this study is the first to include life and non-life insurance companies, both listed and non-listed. Three multiple regression analyses were run between various corporate governance arrangements and a new insurance-related variable, the adjusted combined ratio, as a performance measure, in addition to the return on assets (ROA) and the return on equity (ROE). The main findings show that longer tenure length and an extra bonus ratio with higher ownership ratio for executives, but a shorter tenure length for independent non-executives, improve firm performance in insurance companies. Furthermore, the findings for the sub-samples indicate the association between corporate governance and firm performance in non-life and listed insurance companies, during the financial crisis of (2007-2009), and even more afterwards, as well as during the soft phases of the underwriting insurance cycle, rather than the hard phases.

Keywords: Corporate Governance, Firm Performance, Insurance, Financial Crisis, Underwriting Cycle, United Kingdom.

Chapter 2

2.1 Introduction

Corporate Governance has been extensively explored in the UK following a series of unexpected corporate failures in the early 1980s, leading to the Cadbury report on UK Corporate Governance in 1992 (Diacon and O'sullivan, 1995). Subsequent reports have offered recommendations to improve the practice of corporate governance in the UK and, thus, the UK corporate governance code was released in 1998, and has been revised regularly thereafter.[11] The UK Code is based on a 'Comply or Explain' approach, which means that companies are free to choose whether to comply with its principles or to explain the reasons for any non-compliance in their annual reports (FRC, 2014; FRC, 2016). With this unique approach, the UK Corporate Governance Code, 'The Code', has been recognised widely as an international benchmark for good corporate governance practice (Arcot, Bruno and Faure-Grimaud, 2009; FRC, 2012a).

One of the major concerns of governance studies has been to identify the good practices of corporate governance, which include (according to OECD, 1999; OECD, 2004) an active board of directors, separation of the chairman and CEO, and a majority ratio of the Non-Executive directors, leading to improved firm performance and achieving long-term sustainable success (FRC, 2014). However, it is evident that most good governance practices are mainly designed to resolve conflicts between shareholders and the management; no clear impact has been found, Chen, Li and Shapiro (2011) claims, on the conflicts between controlling shareholders and minority shareholders and their negative effect on corporate performance. On the other hand, Lipton and Lorsch (1992) argued that good corporate governance does not necessarily improve performance. Nevertheless, if a company has weak performance due to poor management or failed strategy, good governance practices can help to deal with the problem and improve performance (Lipton and Lorsch, 1992).

[11] In December 1992, the Cadbury Committee, established by the Financial Reporting Council (FRC), the London Stock Exchange and the accountancy profession, and chaired by Sir Adrian Cadbury, issued the first report on the quality and objectives of corporate governance in the UK, underlining the link between governance structure and performance (Cadbury, 1992; Diacon and O'sullivan, 1995). In the Cadbury Report 1992, corporate governance refers to "the system by which companies are directed and controlled" (Cadbury, 1992; FRC, 2014). Later, in 1994, the principles were appended to the listing rules of the London Stock Exchange although companies were free to comply or not with those principles. Subsequent committees have brought further changes to the existing principles and recommendations in the Cadbury Code, namely, the Greenbury Committee (1995), the Hampel Committee (1998), the Turnbull Committee (1999), and Sir Derek Higgs (2003). From 2003, The FRC has been responsible for the Combined Code, and reviews the Code regularly. In response to the global financial crisis 2007-09, the David Walker Review (2009) included recommendations for all companies, although it focused mainly on the banking industry. In 2010, the Financial Reporting Council issued a new Stewardship Code, along with a new version of the 'UK Corporate Governance Code' [the Code]. The latest UK Corporate Governance Code was released in April 2016. (FRC, 2016).

In general, good corporate governance enables better access to funding and reduces the cost of capital, by increasing the confidence of investors and lenders in a company (Babu and P.Viswanatham, 2013; Ahmad, Iqbal and Tariq, 2014), as well as enhancing performance and promoting disclosure in financial reporting, which leads to greater market liquidity and increased firm valuations (Babu and P.Viswanatham, 2013). Earlier studies have explored the relationship between corporate governance and firm performance (see Core, Holthausen and Larcker, 1999; Short and Keasey, 1999; Gompers, Ishii and Metrick, 2003; Huang, Hsiao and Lai, 2007; Anderson and Gupta, 2009; Andreou, Louca and Panayides, 2014), comparing different sets of corporate governance arrangements, such as board composition, board effectiveness and board remuneration, with a variety of performance measures, such as accounting and market measures of performance.

The UK is one of the world's leading financial markets, and has the most competitive, efficient and secure banking systems in the world. Equally important, the UK Insurance market is the largest in Europe, and the third largest in the world after the US and Japan (ABI, 2013). It is quite a large sector, managing around £1.8 trillion in investments and contributing over £10 billion in taxes. It is also a substantial part of the whole economy, which offers safety to policyholders by transferring the loss risk from one entity to another in exchange for premiums, and one of the major exporters, with 26% of its net premium income coming from selling insurance overseas (Thecityuk, 2011; ABI, 2013). In this regard, corporate governance is considered to be a key factor to improve performance, thereby facilitating growth in insurance companies, as it promotes accountability, enhances transparency, improves profitability and, finally, protects stakeholders' interests (Babu and P.Viswanatham, 2013). However, as a result of the financial crisis, regulators, shareholders, and policyholders have questioned the effectiveness of the existing corporate governance system for monitoring insurance companies (Boubakri, 2011). Therefore, it is important to explore the effects of the global financial crisis of 2007-09 on the way that boards of directors have managed their companies, and to what extent they have been successful in improving the corporate performance.

While much academic research has been done on corporate governance in non-financial companies (see Short and Keasey, 1999; Core, Holthausen and Larcker, 1999; Bhagat and Bolton, 2008; Anderson and Gupta, 2009; Munisi and Randøy, 2013; Andreou, Louca and Panayides, 2014; Yoo and Jung, 2014), less research has focused on financial firms in which the banking industry has been the main focus (see Olatunji and Stephen, 2011; Aebi, Sabato and Schmid, 2012; Dedu and Chitan, 2013). However, there has been only a limited amount of empirical research into corporate governance practices across insurance companies (see Wang, Jeng and Peng, 2007; Boubakri, 2011; Huang *et al.*, 2011), with a few exceptions in the

UK. For instance, Diacon and O'sullivan (1995) examined the impact of a variety of governance arrangements on the performance of UK life insurance firms.

This study complements other studies and aims to examine the impact of various corporate governance arrangements and practices on firm performance over the period 2004 - 2013. It focuses on both listed and non-listed firms in the UK insurance market whether life, non-life, or composite companies. Another objective, to the best of researcher's knowledge, is to use a new insurance-related measure, the adjusted combined ratio, as a performance measure, and to see whether this new variable create any insights. This study also aims to give insight into the effectiveness of corporate governance practices used prior to, throughout and following the Financial Crisis (2007-09), as well as taking into account the underwriting insurance cycle[12]. To sum up, this study will try to answer the following research questions:

1. ***Does corporate governance affect the performance of insurance firms?***
2. ***Which particular corporate governance arrangements are more important in affecting firm performance?***
3. ***Have insurance line, listing, underwriting cycle, and the recent financial crisis of 2008, changed the relationship between corporate governance and firm performance?***

The rest of this chapter is organised into four sections as follows. Section 2 reviews the literature on the relationship between various corporate governance arrangements and firm performance. Section 3 describes the sampling and data collection, and discusses how variables have been estimated. It also explains the research design and methodology used in this study. Section 4 presents a summary of the descriptive statistics of the dependent, independent & control variables. The results of the specification tests and regression models are then presented and discussed. Finally, section 5 presents the research findings, contributions, limitations and further research areas.

[12] The features of a soft insurance market are lower premiums, broader coverage, easier underwriting, more policies, and increased competition among insurers, while in the hard market, the premiums are higher with more strict underwriting criteria, fewer written policies and less competition as well (English, 2013).

2.2 Literature Review

Corporate governance refers to the means by which companies are directed and controlled, and shareholders' value is enhanced by a set of rules and procedures that define how the board of directors, managers, shareholders and other stakeholders relate to each other in order to retain a long-term sustainable success for those companies (Cadbury, 1992; FRC, 2014; Diacon and O'sullivan, 1995; OECD, 2004; Boubakri, 2011). This term first appeared in the 1930s to mitigate the conflicts of interests between corporate owners, 'principals', and managers, 'agents', due to the separation between ownership and control[13], which explains, according to (Jensen and Meckling, 1976), why corporate governance became significant. Thereafter, corporate governance research has increasingly recognised that boards of directors have a central role to play in reducing agency problems (Zahra and Pearce, 1989). However, even though the presence of 'good' corporate governance standards is essential to achieve success, by attracting more investment and the most qualified and efficient staff, it does not guarantee a long-lasting success, which depends on many other factors outside the control of directors (OECD, 2004; Njegomir and Tepavac, 2014).

2.2.1 Firm Performance and Corporate Governance

Earlier studies have explored the relationship between specific arrangements of corporate governance, such as Board Remuneration and Ownership, and several performance metrics, either accounting-based or market-based measures (see Agrawal and Knoeber, 1996; Demsetz and Villalonga, 2001; Orlitzky, Schmidt and Rynes, 2003; Jackson and Moerke, 2005; Thomsen, Pedersen and Kvist, 2006). Most prior studies have found that well-governed firms are generally associated with improved corporate performance (see Diacon and O'sullivan, 1995; Andreou, Louca and Panayides, 2014; Daily and Dalton, 1998; Core, Holthausen and Larcker, 1999; Gompers, Ishii and Metrick, 2003; Kiel and Nicholson, 2003; Klapper and Love, 2004; Black, Jang and Kim, 2006a; Bhagat and Bolton, 2008; Dahya, Dimitrov and Mcconnell, 2008; Anderson and Gupta, 2009; Sami, Wang and Zhou, 2011; Guo and Kga, 2012; Peni and Vähämaa, 2012; Munisi and Randøy, 2013). For example, Klapper and Love (2004) found that better corporate governance was positively associated with operating performance, and that this relationship becomes stronger in countries with weaker legal systems. Bhagat and Bolton (2008) also found that corporate governance index, managerial ownership and CEO-Chair

[13] Agency theory argues that the delegation of executive duties by principals to agents requires a set of guidelines and rules to either align the interests of owners and managers, or monitor the performance of mangers to ensure they use their delegated powers in the best interests of the firm owners (Huang et al., 2011). In this regard, corporate governance can be seen as a mechanism whereby a board of directors is a vital monitoring tool to minimize the principal-agent problems, which reduces the agency costs, and maximises the firm's value (Deegan, 2004; Mallin, 2004). Deviation from the objectives of corporate principals and agents, Diacon and O'sullivan (1995) and Dharwadkar, George and Brandes (2000) argue, results from weak governance as well as the inability of minority shareholders to monitor and control managers' activities.

separation had a significant positive impact on operating performance in the US between 1990 and 2004. In the UK context, Diacon and O'sullivan (1995) examined the impact of a variety of governance arrangements on the performance of all major UK life and non-life insurance companies, and found that their independent impact on performance was complex, highly nonlinear, and dependent on the nature of the business transacted.

However, this governance-performance association has not received much attention during turbulent financial periods, such as the Global Financial Crisis of 2007-09 (Erkens, Hung and Matos, 2012; Ressas and Hussainey, 2014)[14], and there is only a limited amount of research exploring to what extent such crises have affected the association between corporate governance and firm performance (see Erkens, Hung and Matos, 2012; Aebi, Sabato and Schmid, 2012; Peni and Vähämaa, 2012; Gupta, Krishnamurti and Tourani-Rad, 2013; Van Essen, Engelen and Carney, 2013). For example, Erkens, Hung and Matos (2012) investigated the influence of two corporate governance arrangements, independent directors and powerful shareholders, on firm performance in a sample of large financial institutions across 30 countries. This study found that weak performance was manifested by most firms during the crisis period if they had institutional shareholders and more independent outsiders, leading to more risk-taking by managers (Erkens, Hung and Matos, 2012). However, Aebi, Sabato and Schmid (2012) focused more on risk governance and examined the association between the risk governance and performance of banks during the financial crisis, and their results indicated no association between standard corporate governance arrangements and banks' performance during the crisis. On the other hand, Peni and Vähämaa (2012) revealed mixed results in the US banking industry, in which corporate governance had a positive relationship with profitability, while a negative effect was found between good governance and stock performance in the middle of the crisis. Therefore, this study provides an additional evidence regarding the governance-performance association pre-, during, and post- the financial crisis of (2007-2009) in the UK context.

In the current study, the relationship between various corporate governance arrangements and three proxies of firm performance is summarised in a conceptual framework[15], as shown in Figure 1.

[14] The crisis has started in the United States, resulted in the collapse of well-known financial institutions such as Lehman Brothers, leading to extra pressure on governments around the world to rescue financial systems, especially banks, financial services, insurance companies and real estate investment trusts (Erkens et al., 2012; Ressas and Hussainey, 2014).

[15] A conceptual framework is a schematic presentation of the variables under investigation.

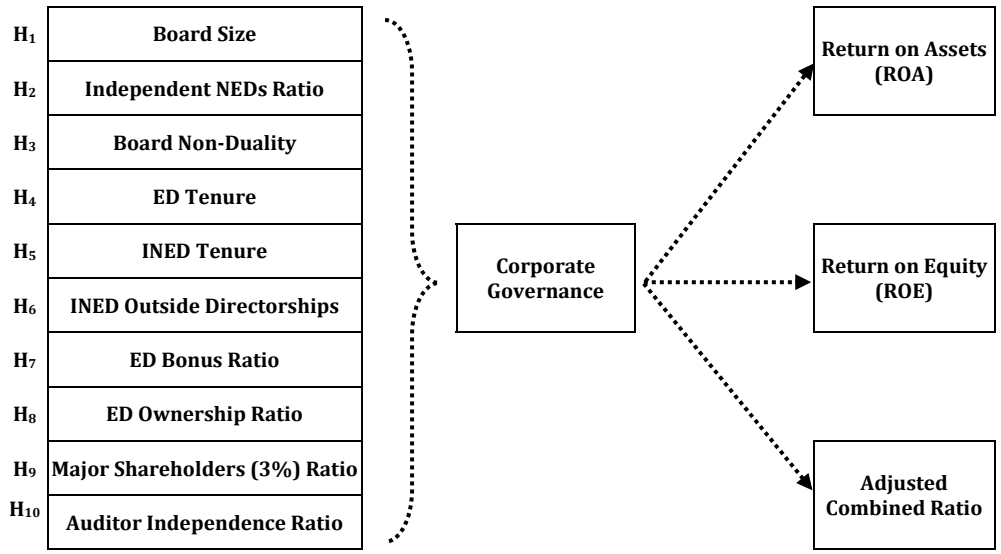

Figure 2-1: A Framework of the impact of Corporate Governance on Firm Performance

*(**Source**: the researcher's interpretation of the suggested framework of the relationship between various corporate governance arrangements and three proxies of firm performance.)*

2.2.2 Corporate Governance Arrangements and Practices: Hypotheses Development

The purpose of this section is to derive hypotheses from the following corporate governance arrangements, which are measured in a manner compliant with the UK Corporate Governance Code (2003-2012). Following a pilot analysis of seven insurance firms during the period 2004-2013, in order to check data availability as well as significance of all available corporate governance arrangements on the proposed relationship, only ten measures were considered to be the most important arrangements that are likely to affect the various performance measures. While other aspects of corporate governance might be important in the governance-performance relationship, the proposed measures have been used, as they offer clear predictions for what 'good' governance is, and provide internal and external ways for governance to affect decision-making.

Regarding the theoretical framework, there are many different theories to explain corporate governance (Mallin, 2012). Among the fundamental theories, Agency Theory (Alchian and Demsetz, 1972; Jensen and Meckling, 1976) is the first to explain corporate governance dilemma, extended into Resource Dependency Theory (Pfeffer and Salancik, 1978), followed by Stakeholder Theory, Transaction Cost Theory and Stewardship Theory (Davis, Schoorman and Donaldson, 1997). Other theories have been developed later, such as Class Hegemony Theory, Managerial Hegemony Theory, Institutional Theory, Political Theory and Network Governance Theory (see Mallin, 2012). For the purpose of this study, only the agency theory and resource dependency theory have successfully explained the proposed corporate governance arrangements.

Agency theory has been first introduced by Alchian and Demsetz (1972), and then developed by Jensen and Meckling (1976), and it consists on the separation of ownership and control. In this theory, principals, shareholders or owners of the company, hires the agents, executives and management team, to operate the company in the principals' best interests, and thus, protect the ownership rights of shareholders. However, this theory suggests also that managers can be self-interested, and they might make decisions against the principals' interests (Clark, 2004; Davis, Schoorman and Donaldson, 1997; Jensen and Meckling, 1976; Ross, 1973; Padilla, 2002) (Abdullah and Valentine, 2009). Indeed, agency theory can be used to investigate the relationship between the ownership and management structure. However, in the case where there is a separation, this theory can be applied to align the objectives of the management team with those of the owners (Abdullah and Valentine, 2009). In this regard, corporate governance can be seen as a mechanism where a board of directors is a vital monitoring tool to minimize the principal-agent problems, which leads to reduce the agency costs, and maximise the firm's value (Deegan, 2004; Mallin, 2004). The deviation in the objectives of corporate principals and agents, Diacon and O'sullivan (1995) and Dharwadkar, George and Brandes (2000) argue, results from weak governance as well as the inability of minority shareholders to monitor and control managers' activities.

On the other hand, resource dependency theory focuses on the key role that the board of directors plays, through their linkages to external environment, in securing access to resources that are essential to firm success, such as information, skills, access to suppliers, buyers, public policy makers, social groups as well as legitimacy. (Pfeffer and Salancik, 1978; Johnson, Daily and Ellstrand, 1996; Hillman, Canella and Paetzold, 2000). Therefore, directors can be categorised into four groups; insiders, business experts, support specialists, and community influential (Abdullah and Valentine, 2009). In this regard, the uneven distribution of needed resources by the organisations leads to the development of exchange relationships or network governance between organisations, which could reduce transaction costs associated with that environmental interdependency (Donaldson and Davis, 1991; Williamson, 1985).

Board Size

One of the most important governance arrangements to minimise agency problems is the board of directors (Marnet, 2005). According to Cadbury (1992), every company should have a board of directors, elected by shareholders, which is responsible for the good governance and the long-term success of the company (FRC, 2014). Indeed, the FRC (2014) recommends that the board should be of sufficient size that meets the business's requirements. Previous studies, such as Huang *et al.* (2011) and Andreou, Louca and Panayides (2014), showed a significant

negative effect of board size on firm performance. Dedu and Chitan (2013) explained that smaller boards help to make decisions more quickly, while large boards are harder to coordinate, which might lead to less control and flexibility in the decision-making process. However, (Saravanan, 2012) stressed a strong positive correlation between firm value and board size, as large boards can play an important monitoring role as they are less likely to be dominated by management (Hussainey and Al-Najjar, 2012), while Kathuria and Dash (1999) argued that the contribution of an additional board member decreases as the size of the board increases. Indeed Eisenberg, Sundgren and Wells (1998) claimed that this increase is likely to be in the outside directors, rather than insiders. Those outsiders, according to the Resource dependence theory [16], can use their external connections to bring more resources to the company (Chen, Li and Shapiro, 2011), while they also have the incentive to avoid risk, since, if the firm fails, they consider their reputation cost to be higher than would be their benefits if the firm is successful (Eisenberg, Sundgren and Wells, 1998). On the other hand, (Bhagat and Black, 1997; Connelly and Limpaphayom, 2004; Wintoki, Linck and Netter, 2012; Andreou, Louca and Panayides, 2014) found no meaningful relationship between board size and performance.

According to the resource dependence theory and the agency theory, the following hypothesis has been assumed:

H_1: There is a positive relationship between board size and firm performance.

Independent Non-Executive Directors

The board should consist of a mixed number of executive (Inside) and non-executive (Outside) directors (Weir and Laing, 2001; Clifford and Evans, 1997) [17]. According to (Cadbury, 1992; FRC, 2014), the majority of the board, excluding the chairman, should comprise independent non-executive directors, while a smaller company should have at least three non-executive directors, two of whom should have non-financial or personal ties to executives, i.e. they are independent directors.[18] It is argued, according to agency theory, that outside directors, independent directors particularly, are more effective than insiders at monitoring and evaluating the activities of the CEO and executive directors, as they wish to protect their reputations (Fama, 1980; Fama and Jensen, 1983). It is also claimed, according to the Resource

[16] Resource dependence theory focuses on the key role that the board of directors plays, through their linkages to the external environment, in securing access to resources that are essential to firms' success, such as information, skills, access to suppliers, buyers, public policy makers, social groups as well as legitimacy. (see Pfeffer and Salancik, 1978; Johnson, Daily and Ellstrand, 1996; Hillman, Canella and Paetzold, 2000)

[17] Executive directors are full-time employees of the company, who are responsible for the day-to-day management (Weir and Laing, 2001), while non-executive directors are not employees of the company or affiliated with it in any other way (Clifford and Evans, 1997).

[18] The UK Corporate Governance Code states that boards should identify in the annual report each non-executive director who is considered to be independent (FRC, 2014).

dependence theory, that non-executive directors might have more connections with external organisations, and thus, can secure more external resources for the company (Chen, Li and Shapiro, 2011). Therefore, outside directors are positively associated with firm performance (Daily and Dalton, 1993; Dare, 1993; Diacon and O'sullivan, 1995; Dahya and Mcconnell, 2007). However, Yermack (1996) and Bhagat and Black (1999) found a negative relationship between the proportion of outside directors and corporate performance, while Vegas and Theordorou (1998) and Weir and Laing (1999) found no relationship between the proportion of non-executive directors and corporate performance in the UK.

Therefore, consistent with agency theory and the resource dependence theory, it has been supposed that:

H_2: There is a positive relationship between the proportion of independent NEDs and firm performance.

CEO / Chair Non-Duality

The function of the chairperson is to run board meetings and oversee the process of hiring, firing, evaluating, and compensating the executive team, including the CEO. In the UK, the Cadbury Committee recommended that there should be a clear separation of responsibilities at the head of the company to ensure a balance of power and authority (Cadbury, 1992; FRC, 2014) so, thus, no one individual has unfettered powers of decision. (Diacon and O'sullivan, 1995). Therefore, it has been argued that this separation would improve operating performance (Bhagat and Bolton, 2008; Andreou, Louca and Panayides, 2014). (Fama and Jensen, 1983; Gul and Leung, 2004) argued that, otherwise, the board of directors might not be able to independently and efficiently oversee management activities, as the board itself might be controlled by the CEO, who will be able to extract additional compensation from the company (Core, Holthausen and Larcker, 1999). In a study of UK insurance companies, Diacon and O'sullivan (1993) stated that a non-dual CEO-Chairman had a substantial positive influence on firm performance in UK life insurance companies.

Therefore, consistent with agency theory, the following hypothesis has been tested:

H_3: There is a positive relationship between board non-duality and firm performance.

Board Tenure

According to Huang *et al.* (2011), board tenure length[19] is the average number of years directors stay on a board. Vafeas (2003) argued that a director with longer tenure is associated with more firm-specific experience, commitment, and proficiency, leading to improved firm performance. Other studies have stressed this positive relation between board tenure and firm performance (Olson, 2000; Golden and Zajac, 2001; Dulewicz and Herbert, 2004). However, Mason and Wallace (1987) argued that long tenure may make directors complacent about their duties, and thus, result in poor performance. In addition, longer board tenure, according to agency theory, would reduce board independence as board objectivity in decision-making process declines over time, which negatively affects firm performance (Huang et al., 2011). With this regard, Marnet (2011) argues that the election of strictly time-limited directors, without possibility for renewal or subsequent re-election, would further support the emergence of an independent view on the board. On the other hand, O'sullivan and Wong (1999) argued that non-executive directors become less effective if they continue with the same board for a long time. In this regard, the UK code recommended that non-executives with more than nine years tenure should be subject to annual re-election (FRC, 2014).

Based on the agency theory, the following hypotheses has been examined:

H_4: There is a positive relationship between tenure length of executive directors and firm performance.

H_5: There is a negative relationship between tenure length of independent NEDs and firm performance.

Board Busyness

Fama (1980) claimed that outside directorships are considered as a valuable source of incentives for directors to maintain their reputation as monitoring experts. According to Resource dependence theory[20], a board with directors who have multiple outside directorships would help to facilitate access to resources critical to the firm's success and, thus, to improve firm performance (Huang *et al.*, 2011). Other empirical studies, such as (Dowen, 1995; Ferris, Jagannathan and Pritchard, 2003; Andreou, Louca and Panayides, 2014), found the average number of additional outside directorships, which can be used as a measure for board competency and expertise, to be positively related to firm performance. Moreover, it is evident

[19] Huang et al, (2011) suggested that the average tenure of directors has a significant negative relationship with busy directors, which indicate that directors with long tenure on the board are less likely to hold many outside directorships.

[20] In Resource dependence theory, directors are able to connect the company to the resources needed to achieve corporate objectives (Mallin, 2012).

that firms receive better credit ratings by having formal governance policies and directors with multiple outside directorships on their boards (Ashbaugh-Skaife, Collins and Lafond, 2006; Field, Lowry and Mkrtchyan, 2013). On the other hand, according to agency theory, too many directorships may negatively affect the monitoring role of outside directors, as they might be too busy to perform their duties prudently and, thus, lead to lower firm performance (Shivdasani, 1993; Core, Holthausen and Larcker, 1999; Fich and Shivdasani, 2006). However, too busy directors, according to Field, Lowry and Mkrtchyan (2013), might be less effective monitors, but they are excellent advisers, thanks to their experience and contacts. Other studies, such as Klein (1998) and (Weir, Laing and McKnight, 2002) found no relationship between the average number of additional directorships and performance.

Therefore, one hypothesis has been assumed in line with the resource dependence theory, as follows:

H_6: There is a positive relationship between the average number of outside directorships of non-executive directors and firm performance.

Board Remuneration

Jensen (1993) and John and Senbet (1998) argued that the board of directors plays a significant role in monitoring the behaviour of senior executives, and reducing their opportunistic behaviour against the company's interests and, thus, board members should be remunerated in order to motivate them to serve shareholders' interests (Amess and Drake, 2003). In this regard, remuneration contracts for executives contain a variety of components, which are a base salary, benefits and performance-related bonus, in order to provide financial incentives for them to act in the interests of the owners (FRC, 2014).

Therefore, the following hypothesis has been supposed, consistent with agency theory:

H_7: There is a positive relationship between the ratio of the bonus paid to executive directors and firm performance.

Board Ownership

Jensen and Meckling (1976) suggested that directors with an increasing number of owned shares can expand their benefits and, thus, they have extra motivation to enhance firm performance, the '*incentive alignment effect*' (Huang, Hsiao and Lai, 2007; Morck, Shleifer and Vishny, 1988). Prior studies found that firm performance is positively associated with board ownership, in which increased ownership helps to align the interests of shareholders and managers from the agency perspective, and improve corporate performance (Jensen and Meckling, 1976; Yermack, 1996; Saker and Saker, 2000; Huang, Hsiao and Lai, 2007). However,

the strength of this relationship will decline with the increase in managers' ownership, the '*entrenchment effect*', in which managers are more likely to reduce the level of information about their governance practices, and thus, shareholders find it hard to control such managers' activities (Morck, Shleifer and Vishny, 1988; Hermalin and Weisbach, 1988; Mcconnell and Servaes, 1990; Holderness, Kroszner and Sheehan, 1999; Hussainey and Al-Najjar, 2012). In contrast, Demsetz (1983) and Fama and Jensen (1983) claimed that market discipline will force managers to make positive efforts towards firm performance at very low levels of ownership. On the other hand, Randoy, Down and Jenssen (2003) found no significant relationship between the level of executive ownership and firm profitability, contrary to the predictions of agency theory.

Therefore, in line with the predictions of agency theory, it was assumed that:

H_8: There is a positive relationship between the ownership ratio of executive directors and firm performance.

Major Shareholders Ratio

Ownership structure affects the nature of the agency problems between shareholders and managers. Indeed, when ownership is fragmented across many shareholders, as typically has happened in the UK, Jensen and Meckling (1976) argued that conflicts between outside shareholders and managers lead to increased agency costs. On the other hand, this agency problems shrinks with concentrated ownership, such as in the USA, in which one or few controlling owners has the will and ability to effectively oversee the management process and, thus, the principal-agent conflicts shift to conflicts between minority and controlling shareholders (Claessens and Yurtoglu, 2013).

Therefore, agency theory suggests that, due to the resources they invest in the company, large shareholders have the motivation and power to reduce the managers' '*entrenchment effect*', ensuring they operate in the shareholders' interests and, thus, enjoy lower agency costs, leading to higher performance, unlike firms with diffused ownership (Fama and Jensen, 1983; Bethel and Liebeskind, 1993; Shleifer and Vishny, 1997; Hussainey and Al-Najjar, 2012). Prior studies have found that large shareholdings are significant and positively linked to corporate performance (Mcconnell and Servaes, 1990; Shleifer and Vishny, 1986a; Smith, 1996; Del Guercio and Hawkins, 1999; Saker and Saker, 2000). On the other hand, Agrawal and Knoeber (1996), Karpoff, Malatesta and Walkling (1996), Short and Keasey (1999)and Faccio and Lasfer (2000) found no such significant relationship, while in other studies, this relationship was vague and unclear as to whether it was positive or negative (Pound, 1988; Short, 1994; Huang, Hsiao and Lai, 2007; Andreou, Louca and Panayides, 2014)

Based on agency theory, this hypothesis has been examined:

H_9: There is a positive relationship between the ownership ratio of major shareholders[21] and firm performance.

External Auditor Independence

The use of external auditor is considered one of the important elements of monitoring systems, and in the UK, external auditors assist the company to evaluate its accounting procedures, and report on the true and fair state of its financial status (Marnet, 2004; Marnet, 2005). The UK Corporate Governance Code advises that the objectivity and independence of the auditor must be maintained at all times, although they might provide non-audit services, such as consulting services, in addition to their main audit services (FRC, 2014). In this regard, the ratio of audit fee to the total fees paid to the auditor might be used as a proxy for audit independence, in which the higher the audit fees compares to the total fees, the greater the independence of the auditor (Huang *et al.*, 2011). Indeed, it has been argued that independent auditors enhance the credibility and reliability of financial statements, thus contributing to effective corporate governance (Defond, Francis and Wong, 2000), since an audit is one type of monitoring activity that have been exist to provide feedback to shareholders on the behavior of managers, in which the cost of audit services represents an agency cost (Colbert and Jahera, 1988). In this regard, independent auditors are more efficient in monitoring the opportunistic behavior of managers, according to the agency theory. However, Schroeder and Hamburger (2002) argued that more non-audit services might help auditors to gain competencies and capabilities that are essential to the audit process, where Defond, Raghunandan and Subramanyam (2002) found a positive relationship between the ratio of non-audit services to total fees and firm performance and, thus, a negative impact for the independence ratio.

Therefore, the following hypothesis has investigated the impact of auditor independence, based on the agency theory, as follows:

H_{10}: There is a positive relationship between the independence ratio of external auditors and firm performance.

To sum up, in accordance with agency theory and resource dependence theory, it can be supposed that only tenure length of non-executives has negative impact on firm performance, while all other corporate governance arrangements are positively associated with firm performance. Those arrangements are: board size, the proportion of independent non-executives, board non-duality, the tenure length of executives, the ratio of bonus paid to

[21] Major shareholders are large shareholders who own at least 3% of outstanding shares.

executives, the ownership ratio of executives, the average number of outside directorships of non-executives, the major shareholders ratio, and the independence ratio of the external auditor.

2.3 Data and Methodology

This section first discusses the research philosophy, approach and methods used to answer the research questions, and justifies the choice of panel data analysis. It then describes the dataset and data sources, and finally, defines the variables used in this analysis.

2.3.1 Research Philosophy, Approach and Methods

A research philosophy is defined as a set of beliefs and views of the knowledge being examined in the research project, in which the philosophical assumptions justify how the research question will be answered (Flick, 2011; Saunders, Lewis and Thornhill, 2012; Bryman, 2012). The main research paradigms are *positivism*, *realism*, *interpretivism* and *pragmatism* (Saunders, Lewis and Thornhill, 2012). This study applied the positivism paradigm since its hypotheses, concerning the impact of corporate governance on firm performance and related theories, can be empirically investigated using researchers' analysis tools rather than their values (Saunders, Lewis and Thornhill, 2012).

The choice of a specific philosophy helps to select the best-suited of two research approaches, deductive and inductive. The deductive approach starts from pre-existing theory to develop hypotheses, and test those assumptions and, thus, it goes from general to the specific (Saunders, Lewis and Thornhill, 2012; Kothari, 2004; Silverman, 2013). In contrast, the inductive approach moves from the particular to general, as researchers start from observations, and then look for patterns in the data, which can help to generate new theories (Flick, 2011; Bryman and Bell, 2011). This study implemented the deductive approach as it was concerned with the need to investigate the casual relationships among variables in order to test hypotheses and, thus, generalise results rather than generate new theories (Saunders, Lewis and Thornhill, 2012).

Research methods take two main forms, namely, quantitative and qualitative. With quantitative methods, numeric data can be effectively collected from a large number of respondents, measured using various quantitative techniques, such as questionnaires and, thus, apply a variety of statistical analysis tools in order to test the established hypotheses (Goddard and Melville, 2004; May, 2011; Bryman, 2012). Qualitative methods, on the other hand, collect information using a descriptive and non-numerical approach, such as interviews, in order to examine the meaning of social phenomena, rather than causal relationships between variables (Berg, 2004; Feilzer, 2010). Researchers have the choice to use either one or more quantitative methods, one or more qualitative methods, or even a mixture of both. The quantitative data required for empirical analysis can be categorised into three groups, cross-

sectional data, time series data, and Longitudinal or panel data. In cross-sectional data, variables from several entities are collected at the same point of time, while in time series data, variables from one entity are observed over a period of time. In panel data, on the other hand, variables from several entities are gathered over a period of time (Gujarati, 2003; Goddard and Melville, 2004; Flick, 2011; Saunders, Lewis and Thornhill, 2012; Bryman, 2012; Greene, 2003; Huang, Hsiao and Lai, 2007)[22].

This study used quantitative methods to collect panel data in order to investigate the impact of corporate governance arrangements on the firm performance of different insurance companies over a period of 10 years. Thereafter, the causal relationship between corporate governance and firm performance was examined using multiple regression analysis, as it is the most appropriate method of analysis when one dependent variable is assumed to be associated with two or more independent variables (Hair *et al.*, 2009). Multiple regression analysis has been widely used in prior studies to investigate the impact of corporate governance arrangements on firm performance (see Diacon and O'sullivan, 1995; Core, Holthausen and Larcker, 1999; Bhagat and Bolton, 2008; Huang *et al.*, 2011).

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[22] The basic regression model for panel data, (Greene, 2003), is written as:

$$\gamma_{it} = X'_{it}\beta + Z'_i\alpha + \varepsilon_{it}$$

Where:

γ_{it} is the dependent variable.
X'_{it} are the independent variables.
β and α are coefficients.
Z'_i is an unobserved entity specific effect.
ε_{it} is the error term.
$_i$ is index for entity
$_t$ is index for time.

However, Greene (2003) argued that the individual effect Z'i contains a constant term and a set of individual of group specific variables. Those variables might be observed, such as gender and location, or unobserved, such as family specific characteristics, which are assumed to be constant over time (Greene, 2003). If Z'i is observed for all individuals, the original model turns into an ordinary least squares (OLS) model, or linear least squares model. Otherwise, panel data can be analysed using either fixed effects or random effects in order to capture the entity and time specific effects (Greene, 2003).

The primary difference between the fixed effects and random effects model is that the fixed effects model allows the intercepts of the regression to vary by entity, and does not require that individual entity effect to be independent of the regressors (Huang et al., 2007). Therefore, if Z'i is unobserved, but correlated with X'it, then the least squares estimator of β is biased and inconsistent due to omitted variables, and the fixed effects model is formulated as follows:

$$\gamma_{it} = X'_{it}\beta + \alpha_i + \varepsilon_{it}$$

Where:

α_i is the unknown intercept for each entity.

The random effects model allows for differences among firms using the firm-specific error component εit, and does require the individual entity effect to be independent of the regressors (Huang et al., 2007) and, thus, the random effects model is expressed as follows:

$$\gamma_{it} = X'_{it}\beta + \alpha + u_i + \varepsilon_{it}$$

Where:

u_i is a group specific random element.

In order to determine whether to apply the fixed effects or the random effects model, researchers often use the Hausman test (1978). Then, the Breusch-Pagan Lagrange Multiplier test (1979), or the F-Test, are required to decide between random effects or fixed effects models respectively, or an ordinary linear model (OLS).

2.3.2 Sample Selection and Data Sources

The sampling frame for this study was extracted from FAME, a database that contains comprehensive information about companies in the UK and Ireland, and included all the 657 active insurance firms in the UK at the end of the year 2014, whether life, non-life, or composite. Those companies were either fully independent companies, parents of other subsidiaries, or subsidiaries of other companies, and authorised by either the Financial Conduct Authority (FCA)/ the Prudential Regulation Authority (PRA) or the European Economic Area (EEA)[23]. The majority of those companies were private limited, while there were only 36 public quoted companies that were listed in London Stock Exchange (LSE) and/or other international stock markets. Therefore, this study included both listed and non-listed firms, since companies that would like to trade in the UK have to submit annually a detailed financial report to the regulatory authorities (Diacon and O'sullivan, 1995). Of the 657 active insurance firms in the UK, a sample of panel data was compiled from three samples, in order to make sure the final sample is representative of the insurance industry in the UK:

- The 36 Listed insurance companies in the London Stock Exchange (LSE) (LSE, 2014).
- The top 70 insurers for 2013 (top 20 for each business line),[24] according to the Association of British insurers (ABI) (ABI, 2014).
- The top 50 insurers for 2013, according to operating revenue and total assets, extracted from the FAME database (Fame, 2014).

Therefore, a sample of 813 firm-year observations, representing 86 firms had been selected over the period 2004-2013 with December 31st year-end. The sample started in 2004 following the release by the Financial Reporting Council (FRC) of the UK corporate governance code 'The Combined Code' in 2003, and ends in 2013, as this was the most recent year for which data was available at the time of data collection. Given the statistical technique employed, firms for which the UK was not the main market, and firms with no insurance data available from the annual reports, were both excluded. For public-quoted companies, the firms also had to have been listed for at least a year before the date of their accounting year end for 2003 to ensure that performance, capital structure and ownership were not affected due to a new listing (Short and Keasey, 1999). The sample selection criteria led to a final sample of 67 firms, with only 27 listed companies, and 647 firm-year observations in total. Finally, information about the UK insurance firms, such as group status, UK Authorised, Listing in London Stock Exchange (LSE), were all obtained from the FAME database. On the other hand, due to the lack of a reliable secondary data source, all corporate governance data, major shareholders information, and

[23] Headquartered in another European country and passport in under the EU Third Life Directive or the EU Third Non-Life Directive (ABI, 2014).
[24] The ABI has over 250 member companies, accounting for over 90% of the UK insurance market (ABI, 2014).

most performance data, including insurance-related indicators, such as premiums, claims and combined ratio, were hand-collected from the annual reports of the companies within the sample.

2.3.3 Variables: Description and Measurement

The key variables used in this study were measures of firm performance and corporate governance arrangements. Additional variables were added to the regression in order to control for the effects on firm performance, which were not captured by the governance variables. Although the majority of variables have been recognised and used in prior research, the way these variables have been calculated varies across the studies. A list of dependent, independent and control variables and their definitions as used in this study are presented in the following table (Table 2-1). Most measures of firm performance and corporate governance were calculated at the end of each year over the period 2004 to 2013. However, the dummy variables for the insurance cycle and the financial crisis of 2007-09 were all lagged, i.e. calculated for a year before the current year. Finally, it was assumed that, for the purpose of this study, causality ran from corporate governance to firm performance even though, in some cases, this relationship could reflect causality in which, for example, directors may increase their ownership in higher performing firms.

Table 2-1: List of Variables

	Variable Name	Label	Value	Source
	Firm Performance Variables			
	ROA	Return on Assets	Net Income / Total Assets	FAME & Annual Reports
	ROE	Return on Equity	Net Income / Shareholders Equity	FAME & Annual Reports
	ADJCOMBND	Adjusted Combined Ratio	ABS [(Net Claims Incurred (inc. Claims Handling) + Operating Expenses) / (Net Premiums Earned + Net Investment Income)]	FAME & Annual Reports
	Corporate Governance Variables			
H1	BRDSIZE_LN	Board Size	LN (Number of directors on the board)	FAME, Annual Reports
H2	BRDNONDLTY	Board Non-Duality	'0' if CEO is also Chair, '1' if separated.	Annual Reports
H3	INED	Ratio of Independent Non-Executive Directors	Independent Non-Executive Directors / Board Size	Annual Reports
H4	EDTNR	Average Tenure Length for Executive Directors (EDs)	Total Number of years EDs have been on the board / Number of EDs	Annual Reports
H5	INEDTNR	Average Tenure Length for Non-Executive Directors (NEDs)	Total Number of years NEDs have been on the board / Number of NEDs	Annual Reports
H6	BUSYINEDOUTDIR	Average of NEDs Outside Directorships	Number of outside directorships held by INED / Number of Independent NEDs	Annual Reports
H7	EDBONUS2ED	Bonus Ratio for Executive Directors	ED Bonus / Total ED Compensation	Annual Reports

	Variable Name	Label	Value	Source
H8	EDOWN	Ownership Ratio for Executive Directors	EDs Ownership / Outstanding Shares	Annual Reports
H9	MJRSHRHLDRS	Major Shareholders (3% or more) Ratio	Number of Shares held by Major Shareholders / Outstanding Shares	Annual Reports
H10	AUDITORIND	Auditor Independence Ratio	Audit Fees / Total Fees (Audit + Non-Audit)	Annual Reports
	Control Variables			
	FSIZE_LN_S	Firm Size	Ln (Total Assets)	Annual Reports
	LVRG_DE	Financial Leverage	Total Debt / Total Equity	FAME & Annual Reports
	LIFE	Whether it only transacts long-term insurance	Yes=1, No=0 (if this 0, and Non-life 0 => Composite)	FAME, Bank of England, Annual Reports
	NONLIFE	Whether it only transacts general insurance	Yes=1, No=0 (if this 0, and life 0 => Composite)	FAME, Bank of England, Annual Reports
	LAG_FINCRIS	Lagged Financial Crisis 2007-2009	Yes=1, No=0	Google & Prior Studies
	LAG_EURCRIS	Lagged Eurozone Crisis 2010-2012	Yes=1, No=0	Google & Prior Studies
	LAG_UKSOFTMAR	Lagged UK Insurance Cycle - Soft Market	Yes=1, No=0 (Hard Market, otherwise)	ABI

I. Corporate Governance Variables

For the purpose on this research, corporate governance arrangements were calculated as follows:

Board Size

Board size was defined as the total number of directors on the board for each firm during the period 2004-2013. However, the natural logarithm of board size was used, as the relationship between board size and performance is convex rather than linear (Yermack, 1996), as follow:

BRDSIZE_LN = Ln (Board Size)

Independent Non-Executive Directors Ratio

This ratio indicates the proportion of independent non-executive directors to the total number of directors on the board (Diacon and O'sullivan, 1995; Olatunji and Stephen, 2011), as follows:

INED = Number of Independent NEDs / Board Size

Board Non-Duality

This was a dummy variable that equalled '0' if the CEO was also the chairman of the company, and '1' otherwise (Diacon and O'sullivan, 1995).

BRDNONDLTY = '0' if CEO is also Chair, '1' if separated.

ED Tenure

This variable represented the average number of years the executive directors (EDs) had been on the board to the number of executive directors, consistent with how (Huang *et al.*, 2011) have calculated the average board tenure:

EDTNR = Total Number of years for EDs / Number of EDs

Independent NED Tenure

This variable represented the average number of years the independent non-executive directors had been on the board to the number of non-executive directors, consistent with how Huang *et al.* (2011) have calculated the average board tenure:

INEDTNR = Total Number of years for Independent NEDs / Number of Independent NEDs

Average of Outside Directorships for NEDs

This average represented the total number of outside directorships held by independent non-executives divided by the number of independent non-executive directors (Ferris, Jagannathan and Pritchard, 2003; Huang *et al.*, 2011).

BUSYINEDOUTDIR = Number of outside directorships held by INED / Independent NEDs

ED Bonus Ratio

The bonus ratio for executive directors was calculated as the performance-related payments divided by the total compensation amount paid to executive directors, consistent with how (Lee, 2009) has estimated the CEO Bonus Ratio.

EDBONUS2ED = ED Bonus / Total ED Compensation

ED Ownership Ratio

This ratio comprised the outstanding shares held by executive directors to the total outstanding shares (Huang, Hsiao and Lai, 2007).

EDOWN = Number of Shares held by EDs / Outstanding Shares

Major Shareholders (3%) Ratio

This ratio represented the proportion of shares held by shareholders who owned 3% of shares at least to the total outstanding shares (Huang *et al.*, 2011).

MJRSHRHLDRS = Number of Shares held by Major Shareholders / Outstanding Shares

External Auditor Independence Ratio

This ratio represented the proportion of audit fees divided by the total fees paid to the external audit firm, which is the reverse ratio of auditor dependence ratio, estimated by (Huang *et al.*, 2011) as the non-audit fees to the total fees.

AUDITORIND = Audit Fees / Total Fees (Audit + Non-Audit)

II. Performance Variables

The main aim of insurance, according to Njegomir and Tepavac (2014), is to mitigate risks and guarantee direct protection against the undesirable effects of those risks. Thus, improving performance in insurance companies would benefit those companies themselves, other stakeholders and the entire society. Indeed, good corporate governance would enhance firm performance through better management and sensible allocation of firms' resources (Mobius, 2002) and, thus, it is important to use proper indicators in order to assess firm performance accurately from either accounting-based or market-based perspective (see Agrawal and Knoeber, 1996; Demsetz and Villalonga, 2001; Orlitzky, Schmidt and Rynes, 2003; Jackson and Moerke, 2005; Thomsen, Pedersen and Kvist, 2006). Oakland (1989) argued that such indicators must be measurable, meaningful, relevant, easy to extract at the lowest cost, and important to the performance of the whole company.

The most frequent accounting-based measures are Return on Assets (ROA) (see Core, Holthausen and Larcker, 1999; Kiel and Nicholson, 2003; Munisi and Randøy, 2013; Yoo and Jung, 2014), and Return on Equity (ROE) (see Baysinger and Hoskisson, 1990; Short and Keasey, 1999; Andreou, Louca and Panayides, 2014). For insurance studies, however, other insurance-related measures have also been used, such as the combined ratio (Browne and Hoyt, 1995; Nathanson, 2004; Okura and Yamaguchi, 2014), the growth in premiums (Armitage and Kirk, 1994), the growth in the market value of total investments (O'sullivan and Diacon, 2003), and the growth in executive remuneration (Brickley and James, 1987; Mayers, Shivdasani and Smith, 1997) or just the salary of the highest paid director (O'sullivan and Diacon, 2003). On the other hand, the most popular market-based measures are Tobin's Q and Market to Book Value (see Barnhart, Marr and Rosenstein, 1994; Himmelberg, Hubbard and

Palia, 1999; Bhagat and Bolton, 2008). Unlike accounting-based measures, which capture only historical aspects of firm performance (Tsoutsoura, 2004), market-based measures are forward-looking indicators focusing on the expected future earnings (Kiel and Nicholson, 2003), multi-industry comparable and, finally, cannot be affected by changes to accounting methods or accruals since they are based on the value of common stock (Daily and Dalton, 1998). However, while most insurers operating in the UK market, and hence in the sample of this study, are privately-owned stock companies, in which market value cannot be estimated for non-listed firms, only accounting-based measures were used to evaluate the performance of UK insurance firms. It was justifiable to use those measures since this study focused on insurance only and, thus, there was no need to compare the performance of different industries. On the other hand, although corporate governance practices might differ from one industry to another, the main principles and objectives are generally similar across industries (Njegomir and Tepavac, 2014). Therefore, and consistent with prior studies, both return on assets (ROA) and return on equity (ROE) were considered as primary proxies for firm performance in this study, in order to make comparable results with other non-insurance governance-performance studies. The adjusted combined ratio was also used as an alternative measure of firm performance for the insurance industry, and a reliable indicator of profitability, including both revenue (premiums and net investment income) and costs (claims and operating costs), rather than using the growth in premiums or investments, or how much executives, or even the highest paid director, have been paid.

Return on Assets (ROA)

Return on assets (ROA) is an accounting-based measure of performance, calculated as net income divided by total assets, and widely used in the governance literature (Core, Holthausen and Larcker, 1999; Bhagat and Bolton, 2008; Huang *et al.*, 2011; Andreou, Louca and Panayides, 2014). It assesses the efficiency of assets employed (Bonn, Yoshikawa and Phan, 2004), and shows investors how much income the firm has generated from investment in assets (Epps and Cereola, 2008). Finally, since managers operate the firm and utilise its assets, it is argued that ROA can help shareholders to assess the extent to which the corporate governance system improves the efficiency of the firm's management (Epps and Cereola, 2008).

In other words, return on Assets (ROA) is an indicator of how efficient the manager of a firm is when using its assets to generate earnings. It is calculated as a ratio of a company net income to its total assets:

ROA = (Net Income) / (Total Assets)

Return on Equity (ROE)

The second proxy of firm performance is the return on equity (ROE), which measures the return for each sterling pound invested in the company, and is also a popular measure in governance literature. (see Tsoutsoura, 2004; Anderson and Gupta, 2009; Sami, Wang and Zhou, 2011; Vintila and Gherghina, 2012). This ratio is calculated as the ratio of net income to total shareholders' equity, as follows:

ROE = Net Income / Shareholders' Equity

Adjusted Combined Ratio

The combined ratio[25] is a measure of profitability used by an insurance company to indicate how well it is performing in its daily operations, and comprises the sum of claims, legal expenses and underwriting costs divided by earned premiums (Fiegenbaum and Thomas, 1990; Nathanson, 2004; Chen *et al.*, 2014). This ratio is expressed as a percentage, in which a ratio below 100% means that the insurance company has achieved an underwriting profit, while a ratio above 100% indicates an underwriting loss (Browne and Hoyt, 1995; Insurance Information Institute, 2002; Nathanson, 2004; Okura and Yamaguchi, 2014). However, the company might still make a profit even if its combined ratio is over 100%, since this ratio does not include return from investments (Insurance Information Institute, 2013). Therefore, the adjusted combined ratio [26] is used in order to properly correlate corporate governance with a reliable indicator of an insurer's profitability. An Adjusted Combined Ratio comprises the sum of incurred losses and expenses divided by the sum of earned premiums and investments.

ADJCOMBND = (Total Operating Expenses + Total Claims Paid) / (Premiums Earned + Net Investment Income)

III. Control Variables

This study recognised that company features, as well as corporate governance arrangements, might affect firm performance in different ways. Therefore, a number of control variables were included in this study, as follows:

[25] Combined Ratio is defined as the sum of Loss Ratio and Expense Ratio (Nathanson, 2004).

[26] The adjusted combined ratio is the sum of claims, legal expenses and underwriting costs, divided by earned premiums and net investment income.

Firm Size

Firm size can affect performance by its potential financing affect (Short and Keasey, 1999), in which larger firms may find it easier to benefit from more funding resources, either internally or externally. Previous research has repeatedly shown that company size has an impact on corporate performance in the way that the effectiveness of the different corporate governance arrangements varies according to the size of the company (Diacon and O'sullivan, 1995; Chen, 2001; Hardwick, Adams and Zou, 2003; O'sullivan and Diacon, 2003). Firm size is calculated as the logarithm of total assets in order to capture the potential economies of scale and scope accruing to large firms (Ang, Cole and Lin, 2000).

FRMSIZE_LN_A = Ln (Total Assets)

Financial Leverage

Financial leverage is calculated as the ratio of debt to equity, since debt may affect performance as it is reduces free cash flow (Jensen, 1986), and high debt means that debtholders monitor highly leveraged firms more closely and put pressure on such firms to adapt good governance practices (Broberg, Tagesson and Collin, 2010) (cited in Munisi and Randøy, 2013), while shareholders' equity is also related to the problems between managers and shareholders.

LVRG_DE = Total Debt / Shareholders' Equity

Insurance Line (Life, Non-Life & Composite)

Consistent with other studies that used industry dummies (Ang, Cole and Lin, 2000; Hussainey and Al-Najjar, 2012; Munisi and Randøy, 2013; Al-Najjar and Hussainey, 2016), two dummy variables were used to control for insurance line of business; life, non-life and composite, in which the first binary variable was for firms selling life products only, and the other for firms selling non-life products only (Diacon and O'sullivan, 1995). Firms selling both life and non-life products (composite status) were assigned '0' for both variables.

Life Company (Selling Life Products Only) ⟹ LIFE =1 & NONLIFE =0
Non-Life Company (Selling Non-Life Products Only) ⟹ LIFE =0 & NONLIFE =1
Composite Company (Selling Both Life & Non-Life Products) ⟹ LIFE =0 & NONLIFE =0

The Global Financial crisis of 2007-09

Prior research has reported that economic booms and recessions have affected both corporate governance arrangements and firm performance, as well as the relationship with each other (see Padgett and Shabbir, 2005; Tan, Wang and Welker, 2011). Therefore, one dummy variable was used in order to control for the effects of the most recent crisis, the financial crisis of 2007-09[27] (Acharya *et al.*, 2009; Guillén, 2009; Edmonds, Jarrett and Woodhouse, 2010; Steiner, 2012). The value of this dummy was equal to one when there was a crisis, and zero otherwise. However, the impact of such crises is evident to appear in the performance of the following year and, thus, a lagged dummy variable were used to control for this crisis, as follows:

LAG_FINCRIS = '1' If Crisis (last year), '0' Otherwise (if there was no crisis last year)

Insurance Cycle (Soft & Hard Market)

Like other industries, the insurance industry is exposed to cycles of expansion and contraction, which are measured by the ratio of premiums to losses (Boyer, Jacquier and Van Norden, 2012). The underwriting cycles typically last from two to ten years comprising two phases, the soft market and the hard market. The soft market has lower premiums, broader coverage, easier underwriting, more policies, and increased competition among insurers, while in the hard market, the premiums are higher with more strict underwriting criteria, fewer written policies and less competition as well (Niehaus and Terry, 1993; Kunreuther, Michel-Kerjan and Ranger, 2011; Lee and Chiu, 2012; Wang *et al.*, 2013; English, 2013; Sephton and Mann, 2014; Browne, Ju and Tu, 2014). To sum up, in the soft market, periods of extremely cheap insurance pricing result in low premiums and substantial underwriting losses, while in the hard market, periods of much higher insurance prices lead to higher premiums (Browne and Hoyt, 1995).
In the UK, the average combined ratio for all insurance companies, which are members of the Association of British Insurers (ABI) representing 90% of the whole UK insurance industry (ABI, 2014), was used as an indicator to show the trend in the underwriting cycle (Grace and Hotchkiss, 1995; Lei and Browne, 2015). Therefore, the value of the insurance cycle dummy is equal to one when the insurance market is soft, and zero otherwise. For the purpose of this study, the underwriting cycle was considered to be a soft market if the UK combined ratio was equal or higher than 100% (± 5%), as follows:

[27] The U.S. experienced this type of systemic failure during 2007-2008 and continued to struggle with its consequences on 2009 (Acharya et al., 2009).

YEAR	UK Combined Ratio*	UK Soft Market	Lagged UK Soft Market
2004	92.40%	0	.m
2005	93.70%	0	0
2006	93.20%	0	0
2007	100.70%	1	0
2008	98.30%	1	1
2009	106.30%	1	1
2010	103.40%	1	1
2011	96.50%	1	1
2012	99.50%	1	1
2013	97.90%	1	1

Figure 2-2: UK Underwriting Cycle 2004-2013
UK Combined Ratios 2004-2013 have been obtained from the Association of British Insurers (ABI)

However, it is evident that the insurance cycle affects the performance of the following year and, thus, a lagged dummy variable was used to control for the insurance cycle (soft market, hard market), as follows:

LAG_UKSOFTMRKT = '1' If Soft Market last year, '0' Otherwise (Hard Market)

2.4 Data Analysis and Discussion

As discussed in the methodology, three regression models were run in order to investigate the impact of various corporate governance arrangements on different measures of firm performance in the UK insurance industry. This section presents the descriptive statistics, robustness checks, results of model specifications and, finally, the regression results for the three models illustrating the relationship between corporate governance and firm performance of UK insurance companies.

2.4.1 Descriptive Statistics

This sub-section summarises the descriptive statistics of the variables used in this study, presenting the main features of the data quantitatively, including mean, median, standard deviation, minimum, and maximum. Firstly, *Table 2-2*, below, provides an overview of the UK insurance firms within the sample. This table shows that firm age ranged from four years to 112 years, with an average of around 42 years old, while firm size differed according to the way it was estimated, based on either total assets or the number of employees (*Table 2-2*). For example, based on the natural logarithm of employees, firm size had an average of around 7, with a minimum of 3 and maximum of 11. The sample comprised 23 life (34%), 36 non-life (54%) and 8 composite (12%) insurance companies on average during the period 2004-2014 (*Table 2-2* and *Table 2-3*). All the companies in the sample were part of a group with around 33% GUOs (global ultimate owners) and 67% subsidiaries (*Table 2-2*). About 97% of the headquarters were based in the UK, while 96% of the companies were authorised by the Financial Services Authority (FSA) and the Prudential Regulation Authority (PRA), with only 4% authorised by the European Economic Area (EEA). Finally, around 61% of those firms were members of the Association of British Insurers (ABI), while only 30% of the whole sample, which accounted for 20 out of 67 insurers on average, were listed in the London Stock Exchange (LSE) and/or in other stock markets, with an average of around 16 year being listed (*Table 2-2* and *Table 2-4*).

Table 2-2: Overview of the Main Figures for the Pooled Sample

Variable	N	Median	Mean	SD	Min	Max
FAGE	643	31	41.93	34.60	1	112
FSIZE_LN_A	647	14.53	14.80	2.14	8.87	19.73
FSIZE_LN_S	475	6.56	6.68	1.79	2.94	10.97
LIFE	647	0	0.34	0.47	0	1
NONLIFE	647	1	0.54	0.50	0	1
GROUP	647	1	1	0	1	1
GUO	647	0	0.33	0.47	0	1

Variable	N	Median	Mean	SD	Min	Max
UKHDQRTR	647	1	0.97	0.16	0	1
UKAUTH	647	1	0.96	0.20	0	1
UKABI	647	1	0.61	0.49	0	1
LSTD_OR	647	0	0.30	0.46	0	1
LSTD_YEARS	165	11	15.74	14.57	1	49

Where FAGE: Firm Age, FSIZE_LN_A: Firm Size = Ln (Total Assets), FSIZE_LN_S: Firm Size = Ln (Staff), LIFE: Life Dummy, NONLIFE: Non-Life Dummy, GROUP: Whether the company is part of a group, GUO: Whether the company has other subsidiaries, UKHDQRTR: Whether the headquarter is the UK, UKAUTH: Whether the company is authorised by the UK (FCA/PRA), UKABI: Whether the company is a member of the Association of British Insurers (ABI), LSTD_OR: Whether the company is listed (In the London Stock Exchange or another market), LSTD_YEARS: the number of years the company is listed

Table 2-3: Life, Non-Life & Composite Lines

Current Year	Life Only	Composite	Non-Life Only	Total
2004	18	12	27	**57**
2005	20	8	33	**61**
2006	21	8	35	**64**
2007	22	7	36	**65**
2008	23	7	36	**66**
2009	23	7	36	**66**
2010	23	7	37	**67**
2011	23	7	37	**67**
2012	23	7	37	**67**
2013	23	7	37	**67**

Table 2-4: Listed in the UK and/or Other Stock Markets

Current Year	Non-Listed	Listed UK Only	Listed Out Only	Listed Both	Total
2004	42	4	1	10	57
2005	44	4	1	12	61
2006	46	4	1	13	64
2007	46	4	1	14	65
2008	46	4	1	15	66
2009	46	4	1	15	66
2010	46	4	1	16	67
2011	46	4	1	16	67
2012	46	4	1	16	67
2013	46	4	1	16	67

On the other hand, *Table 2-5*, below, shows an overview of the board's characteristics for the sample firms during the study period (2004-2013). In General, the average board size was around nine directors (8.69), with a minimum of two and a maximum of twenty-two directors among the 67 insurance firms. With regard to board structure, 80.60% of the board members held UK nationality, while females consisted only 8.96% of the whole board (*Table 2-5*). Regarding board independence, it can be seen that an average of 38.50% board directors were independent non-executives, with a maximum of 90%, while around 85% of the sample firms

had the positions of CEO and Chairman separated, which is consistent with the recommendations of the Cadbury Report (Cadbury, 1992; FRC, 2014). In the terms of board experience, the average board tenure ranged from a few months (0.17) to over ten years (10.33), with an average of around four years (4.15), while board age on average was a little beyond 54 years old, with a minimum of 42 and a maximum of around 68 years old. With regard to board financial incentives, *Table 2-5* indicates that average remuneration of the board was about £250K per year, and ranged from as little as £3.3K to a maximum of £1,271K a year, with an average of 37.24% paid to the highest paid directors, usually the CEOs. On the other hand, directors owned only 24.44% of the outstanding shares, although the top percentage was over 59%, while the major shareholding ratio reached 76% on average (*Table 2-5*).

Table 2-5: Corporate Governance Figures of the Study Sample

Variable	N	Median	Mean	SD	Min	Max
BRDSIZE	645	8	8.69	2.98	2	22
BRDUKRATIO	645	87.50%	80.60%	22.49%	0	1
BRDFMLRATIO	645	7.69%	8.96%	10.54%	0%	50%
INED	645	40%	38.16%	20.14%	0%	90%
BRDNONDLTY	645	1	84.65%	36.07%	0	1
BRDTNR	645	3.89	4.19	1.99	0.17	10.35
BRDAGE	645	55.15	54.29	4.88	41.95	67.71
BRDREMAV	558	188	250.04	194.27	3.33	1,271.24
HPAIDDIR	551	33.02%	37.24%	15.39%	7.09%	93.83%
BRDOWN	647	1%	24.44%	28.67%	0%	59.09%
MJRSHRHLDRS	642	100%	76.34%	36.95%	0%	100%

Where BRDSIZE: Board Size, BRDUKRATIO: Ratio of Board Members with UK Nationality, BRDFMLRATIO: Ratio of Board Female Members, INED: Ratio of Independent Non-Executive Directors, BRDNONDLTY: Whether CEO/Chairman are separated (Non-Duality), BRDTNR: Average Board Tenure, BRDAGE: Average Board Age, BRDREMAV: Average Board Remuneration, HPAIDDIR: Remuneration for the highest paid director, BRDOWN: Board Ownership Ratio, MJRSHRHLDRS: Ratio of Major Shareholders (3%).

I. Corporate Governance Arrangements

Table 2-6, below, presents the descriptive statistics of the various corporate governance arrangements of the insurance firms in the UK, which were used as independent variables in this study. Firstly, the natural logarithm of board size ranged from 0.69 to around 3, equivalent to the range (2-22 directors) when using the real numbers (*Table 2-5*). *Table 2-6* shows that boards had 38.16% of their directors considered as independent non-executives, while only 15.35% of the CEOs also held the chairperson position. With regard to board tenure length, the average tenure length of executive directors was around 4 years and 3 months (4.24) compared to that of non-executives, which was 3 years and 8 months (3.69). However, *Table 2-6* shows that although their average tenure is less, non-executive directors stayed in position for a maximum of 16 years and 7 months (16.57), which was a little bit longer than executives (15.33). On the other hand, non-executives had an average of 4.5 outside directorships, with a

maximum of 26 directorships on average (*Table 2-6*). Regarding board remuneration and ownership, 36% of the executives' compensation was rewarded as bonuses, benefits and other performance-related payments, while those executives owned around 12% of the outstanding shares (*Table 2-6*). Finally, major shareholders, who owned at least 3% of shares, had an average of 75% of the outstanding shares, while the ratio of auditing fees, representing the independence ratio of external auditor, reached 73% on average (*Table 2-6*).

Table 2-6: Corporate Governance Variables

	Variable	N	Median	Mean	SD	Min	Max
H_1	BRDSIZE_LN	645	2.08	2.10	0.37	0.69	3.09
H_2	INED	645	40.00%	38.16%	20.14%	0.00%	90.00%
H_3	BRDNONDLTY	645	100.00%	84.65%	36.07%	0.00%	100.00%
H_4	EDTNR	645	3.72	4.24	2.69	0	15.33
H_5	INEDTNR	645	3.36	3.69	2.81	0	16.57
H_6	BUSYINEDOUTDIR	587	3.50	4.48	4.01	0	26
H_7	EDBONUS2ED	211	37.50%	35.81%	21.25%	0.00%	100.00%
H_8	EDOWN	647	0.27%	12.15%	14.30%	0.00%	29.55%
H_9	MJRSHRHLDRS	642	100.00%	75.48%	37.41%	0.00%	100.00%
H_{10}	AUDITORIND	636	74.27%	73.15%	22.10%	3.51%	100.00%

Where BRDSIZE_LN: Board Size, BRDNONDLTY: Board Non-Duality, INED: Ratio of Independent Non-Executive Directors, EDTNR: Average Tenure Length for Executive Directors (EDs), INEDTNR: Average Tenure Length for Non-Executive Directors (NEDs), BUSYINEDOUTDIR: Average of Independent NEDs Outside Directorships, EDBONUS2ED: Bonus Ratio for Executive Directors, EDOWN: Ownership Ratio for Executive Directors, MJRSHRHLDRS: Major Shareholders (3% or more) Ratio, AUDITORIND: Auditor Independence Ratio

II. Firm Performance Measures

Table 2-7, below, represents the descriptive statistics of the dependent variables. It shows that Return on Assets (ROA), as a proxy of firm performance, ranged from a minimum of minus 22.69% to a maximum of 33.20%, with an average of 2.65% for the whole sample, while the other popular measure, the Return on Equity (ROE), had a higher average (15.53%) and wider range, between minus 67% to around 86%. Finally, the adjusted combined ratio, insurance-related variable, has also been summarised in this table, and shows that the adjusted combined ratio ranged from 5.72% to 376% with an averaged value of 102.86% (*Table 2-7*).

Table 2-7: Firm Performance Variables

Variable	N	Median	Mean	SD	Min	Max
ROA	636	1.37%	2.65%	5.39%	-22.69%	33.20%
ROE	623	12.72%	13.53%	20.61%	-67.23%	86.43%
ADJCOMBND	647	87.81%	102.86%	81.17%	5.72%	375.70%

Where ROA: Return on Assets, ROE: Return on Equity, ADJCOMBND: Adjusted Combined Ratio

III. Control Variables

The descriptive statistics of firm size and financial leverage as control variables are presented for the pooled sample in *Table 2-8*, below, while life and non-life dummies have been described previously in the overview. Firstly, the firm size, as the natural logarithm of total assets, ranged from around 9 to 20 with an average of approximately 15. On the other hand, the financial leverage, calculated as the ratio of debt to equity, swung from as low as 0% to a maximum of around 118, which is a huge ratio, indicating that financing by debt in some firms has outweighed financing through shareholders' equity, with an average ratio of about 12 only.

Table 2-8: Control Variables

Variable	N	Median	Mean	SD	Min	Max
FSIZE_LN_A	647	14.53	14.79	2.14	8.87	19.73
LVRG_DE	621	4.47	11.57	17.49	0.01	117.84
LIFE	647	0	33.85%	47.36%	0	1
NONLIFE	647	1	54.25%	49.86%	0	1

Where FSIZE_LN_A: Firm Size=Ln(Total Assets), LVRG_DE: Financial Leverage (Total Debt / Total Equity), LIFE: Life Dummy, NONLIFE: Non-Life Dummy

2.4.2 Robustness Checks

Prior to selecting which panel regression model to use, and in order to identify potential endogenous variables, some robustness tests have to be carried out, such as a correlation matrix, multicollinearity, heteroscedasticity and serial correlation, in order to identify potential endogenous issues.

I. Correlation Matrix

For the purpose of this study, and since there is no reliable test to check normality for relatively small samples, both the Spearman's and Pearson's Coefficients were estimated and are presented in *Table 2-9*, below. From this table, it can be seen that the independent variables were not highly correlated, as all coefficients were less than 0.9 (Pallant, 2011). Thus, no multicollinearity problems were found among the independent variables. On the other hand, *Table 2-9* shows a positive significant correlation was found between performance measures and the board non-duality, executive tenure, bonus and ownership, major shareholders ratio, while a negative significant correlation was found with the ratio of independent non-executives and the auditor independence ratio. Firm size and financial leverage had a negative correlation with firm performance, while a negative correlation was found with the financial crisis (2007-09) and the soft phase of the underwriting insurance cycle, although significant only with the latter (*Table 2-9*).

Table 2-9: Correlation Matrix (Spearman's & Pearson's Correlations) [p<0.1]*

Spearman's \Pearson's	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
ROA	**1.000**	0.6807*	-0.1029*	0.010	0.006	0.0797*	0.1475*	0.039	-0.1837*	0.0759*	0.008	-0.0829*	-0.016	-0.1835*	-0.2204*	-0.2508*	0.3199*	-0.0744*	-0.0718*
ROE	0.6669*	**1.000**	-0.2094*	0.1335*	0.063	0.1079*	0.1183*	0.054	-0.004	0.045	0.004	-0.0844*	-0.0975*	0.0728*	0.039	-0.016	0.0825*	-0.1214*	-0.1331*
ADJCOMBND	0.044	-0.3341*	**1.000**	-0.022	-0.1103*	0.062	-0.018	-0.054	-0.1884*	0.025	-0.0837*	0.061	0.043	-0.1720*	-0.2039*	-0.1279*	0.0667*	0.1362*	0.066
BRDSIZE_LN	-0.109	0.099	-0.086	**1.000**	0.3472*	0.3515*	0.2098*	0.1504*	0.2205*	-0.1921*	-0.0936*	-0.2982*	-0.2443*	0.3663*	0.040	-0.009	-0.1457*	-0.051	-0.047
INED	-0.2184*	-0.111	-0.116	0.2089*	**1.000**	0.2321*	0.0668*	0.2589*	-0.1434*	-0.0799*	-0.1071*	-0.4790*	-0.2726*	0.2091*	0.021	0.0669*	-0.1558*	-0.002	0.0922*
BRDNONDLTY	0.1568*	0.1629*	-0.032	0.009	-0.1352*	**1.000**	0.1073*	0.059	0.1384*	-0.039	0.067	-0.2579*	-0.1925*	-0.014	-0.1022*	-0.014	-0.063	0.038	0.053
EDTNR	0.3474*	0.3282*	-0.031	-0.021	-0.2405*	0.1512*	**1.000**	0.2506*	-0.010	-0.047	-0.060	-0.1470*	-0.006	-0.1131*	-0.0840*	-0.1241*	0.053	-0.048	0.009
INEDTNR	-0.025	-0.075	0.046	-0.007	0.2058*	-0.065	0.1951*	**1.000**	-0.2224*	0.004	-0.2327*	-0.1342*	0.047	-0.0771*	-0.021	-0.0709*	0.016	-0.003	0.057
EDBONUS2ED	-0.084	0.080	-0.2074*	0.2735*	-0.1451*	0.1740*	0.002	-0.2054*	**1.000**	-0.4662*	0.040	0.097	0.111	0.2763*	0.2549*	0.027	0.013	0.007	0.083
EDOWN_w	0.2139*	-0.086	0.2196*	-0.2976*	-0.2082*	0.096	0.2231*	0.1500*	-0.4759*	**1.000**	0.0946*	-0.042	0.033	-0.1298*	-0.1502*	0.008	0.048	0.037	0.0798*
BUSYINEDOUTDIR	0.014	0.007	-0.102	0.108	0.095	-0.021	-0.041	-0.1460*	-0.018	0.1536*	**1.000**	0.1979*	0.015	-0.012	-0.0746*	-0.028	0.0874*	0.019	0.1386*
MJRSHRHLDRS	0.1594*	-0.063	0.1988*	0.2682*	-0.1398*	0.095	0.097	0.082	0.1556*	0.099	0.039	**1.000**	0.3952*	-0.2660*	-0.1025*	-0.2205*	0.2243*	0.003	-0.009
AUDITORIND	-0.1845*	-0.058	-0.019	-0.006	0.094	0.033	-0.036	0.102	0.092	-0.037	-0.1520*	0.069	**1.000**	-0.1771*	-0.019	-0.1822*	0.1938*	0.018	-0.012
FSIZE_LN_A	-0.3327*	0.099	-0.3630*	0.5486*	0.4049*	-0.111	-0.1453*	-0.047	0.3932*	-0.6360*	0.1455*	-0.2010*	-0.016	**1.000**	0.4664*	0.3246*	-0.4235*	-0.017	0.042
LVRG_DE	-0.5230*	0.110	-0.5022*	0.2758*	0.2805*	-0.050	-0.2648*	-0.060	0.3178*	-0.4822*	0.032	-0.4144*	0.106	0.7009*	**1.000**	0.5235*	-0.5242*	-0.023	0.012
LIFE	-0.3654*	-0.047	-0.2895*	-0.090	0.057	0.087	-0.1722*	-0.072	0.082	-0.036	-0.034	-0.3429*	0.115	0.1914*	0.5953*	**1.000**	-0.7789*	0.011	0.022

Spearman's \Pearson's	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
NONLIFE	0.4816*	0.057	0.4096*	-0.1391*	-0.3531*	-0.022	0.2750*	-0.036	-0.036	0.1311*	0.028	0.3153*	-0.094	-0.5580*	-0.7119*	-0.6682*	**1.000**	0.009	0.031
LAG_FINCRIS	-0.078	-0.120	0.024	-0.054	-0.048	0.070	0.006	0.1676*	0.018	0.007	-0.032	0.058	-0.027	-0.040	-0.034	0.020	0.052	**1.000**	0.3124*
LAG_UKSOFTMAR	-0.1588*	-0.2061*	0.110	-0.013	0.117	-0.046	-0.040	0.086	0.097	0.038	0.1802*	0.078	-0.048	0.025	-0.012	0.021	0.078	0.2886*	**1.000**

Where BRDSIZE_LN: Ln(Board Size), BRDNONDLTY: Board Non-Duality, INED: Ratio of Independent Non-Executive Directors, EDTNR: Average Tenure Length for Executive Directors (EDs), INEDTNR: Average Tenure Length for Non-Executive Directors (NEDs), BUSYINEDOUTDIR: Average of Independent NEDs Outside Directorships, EDBONUS2ED: Bonus Ratio for Executive Directors, EDOWN: Ownership Ratio for Executive Directors, MJRSHRHLDRS: Major Shareholders (3% or more) Ratio, AUDITORIND: Auditor Independence Ratio, FSIZE_LN_A: Firm Size=Ln(Total Assets), LVRG_DE: Financial Leverage (Total Debt / Total Equity), LIFE: Life Dummy, NONLIFE: Non-Life Dummy, LAG_FINCRIS: Lagged Financial Crisis 2007-2009, LAG_UKSOFTMAR: Lagged UK Insurance Cycle - Soft Market

II. Multicollinearity Test (VIF)

This study calculated the Variance Inflation Factor (VIF), which is used to identify the presence of multicollinearity, e.g. whether two or more variables are highly correlated, which might affect the estimation of the regression parameters (Hair *et al.*, 2009). The VIF test is written as follows (Wooldridge, 2002):

$$\mathrm{VIF} = \frac{1}{1 - R_i^2}$$

Where:

R_i^2 is the unadjusted R^2 when you regress X_i against all the other independent variables in the model.

Therefore, if the VIF result is bigger than 10, there is a problem with multicollinearity (Gujarati, 2003).

It can be easily seen from *Table 2-10* that the test indicated no multicollinearity problems, since the variance inflation factor (VIF) results for all regression models was less than 10.

Table 2-10: Multicollinearity Test using Variance Inflation Factor (VIF)

Model	Multicollinearity Test (VIF) *[if VIF<10 => there is no Multicollinearity problem]*
Model 01 (ROA)	Mean VIF = 2.82
Model 02 (ROE)	Mean VIF = 2.82
Model 03 (ADJCOMBND)	Mean VIF = 2.87

III. Heteroscedasticity Test

Heteroscedasticity was tested in this study, as it can invalidate statistical tests of significance that assume that the modelling errors are uncorrelated and uniform, and that their variances do not vary with the effects being modelled (Johnston, 1972). *Table 2-11*, below, shows the results of the Modified Wald Test, indicating no problem with heteroscedasticity among the three models.

Table 2-11: Heteroscedasticity Test

Model	**Modified Wald Test for Groupwise Heteroscedasticity** *[if<0.05 => there is no Heteroscedasticity]*
Model 01 (ROA)	Prob>chi2 = 0.0000
Model 02 (ROE)	Prob>chi2 = 0.0000
Model 03 (ADJCOMBND)	Prob>chi2 = 0.0000

IV. Serial Correlation Test

Finally, serial correlation, or autocorrelation, in linear panel-data models can bias the standard errors and cause the results to be less efficient (Drukker, 2003). Therefore, the Wooldridge test for autocorrelation in panel data was used, and no serial correlation was found among all the regression models in this study (*Table 2-12*).

Table 2-12: Wooldridge Test for Autocorrelation in Panel Data

Model	**Wooldridge Test for Autocorrelation in Panel Data** *[If<0.05 => Variables are not serially correlated]*
Model 01 (ROA)	Prob>F = 0.0008
Model 02 (ROE)	Prob>F = 0.0051
Model 03 (ADJCOMBND)	Prob>F = 0.0007

2.4.3 Model Specifications

Since this study used panel data to explore the impact of corporate governance on firm performance, some specification tests were carried out in order to select the most appropriate panel model for each regression. Those tests are the Hausman test, the Breusch-Pagan Lagrange Multiplier test (LM), the F-test, and finally, testing for time fixed effects (see Hausman, 1978; Gujarati, 2003; Greene, 2008; Breusch and Pagan, 1979; Lomax, 2007; Torres-Reyna, 2007)[28]. *Table 2-13* below presents a summary of the specification tests for all three regressions.

[28] Prior to multiple regression analysis, some model specifications were implemented on the panel data in order to select the most suitable regression model/s for this study.:

Table 2-13: Results of Specification Tests

Specification Test	Model 01 (ROA)	Model 02 (ROE)	Model 03 (ADJCOMBND)
Hausman test for fixed versus random effects model *[If ≤0.05 ⟹ Fixed Effects]*	Prob>chi2 = 0.1543	Prob>chi2 = 0.0173	Prob>chi2 = 0.0000
Breusch-Pagan LM test for random effects versus OLS *[if≤0.05 ⟹ use Random Effects]*	Prob>chibar2 = 0.0000	-	-
F-Test for fixed effects versus OLS *[if Prob>F ≤0.05 ⟹ use Fixed Effects]*	-	Prob>F = 0.0000	Prob>F = 0.0056
Testparm (Testing for Time-Fixed Effects) *[if≤0.05 ⟹ time fixed_effects needed]*	-	Prob>F = 0.0023	Prob>F = 0.4013
Decision	Random Effects	Time Fixed Effects	Fixed Effects

Firstly, by using the Hausman test in order to choose between fixed and random effects, the results cannot reject the null hypothesis for the first model, while the fixed effects model was chosen for the second and third since their results were less than 0.05 (*Table 2-13*). Secondly, the Lagrange Multiplier test (LM) for random effects showed that the first model rejected the null, suggesting that panel regression was necessary (*Table 2-13*). On the other hand, the F-Test

I. Hausman Test

The Durbin–Wu–Hausman test (also called the Hausman specification test) is a statistical hypothesis test in econometrics, developed in 1978 by Jerry A. Hausman (Hausman, 1978), has to be done first in order to determine whether the panel regression belongs to the fixed effects or random effects model, which helps to capture the effects of firm and time specific heterogeneities (Gujarati, 2003). The Hausman test is calculated as follows:

$$H = (\beta RE - \beta FE)'[Var(\beta FE) - Var(\beta RE)]\text{-}1\ (\beta RE - \beta FE)$$

Where:

$\boldsymbol{\beta_{FE}}$ are the coefficient estimates of the time-varying covariates from the fixed effects model.
$\boldsymbol{\beta_{RE}}$ are the corresponding estimated coefficients from the random effects model.
$\boldsymbol{Var(\beta_{FE})}$ is the estimate of the asymptotic (large sample) variances and covariance of the estimated coefficients.
$\boldsymbol{Var(\beta_{RE})}$ is the analogous quantity for the estimate of .

Therefore, if there is no correlation between the independent variable(s) and the unit effects, then estimates of β in the fixed effects model (βFE) should be similar to estimates of β in the random effects model (βRE) (Greene, 2008). In other words, if the result is equal or less than 0.05, the null hypothesis is rejected and the fixed effects model should be used since there are no differences between the estimates of $\boldsymbol{\beta}$ whether using fixed or random effects.

Then, either the Breusch-Pagan test (for random effects) or the F-test (for fixed effects) have to be carried out in order to make sure that the chosen model is more appropriate than the pooled ordinary linear model (OLS), as follows:

II. Breusch-Pagan Lagrange Multiplier Test (LM)

The Breusch–Pagan Lagrange Multiplier test (LM) was developed in 1979 by Trevor Breusch and Adrian Pagan (Breusch and Pagan, 1979), and is used to check the model for random effects based on the simple OLS (pooled) estimator (Gujarati, 2003). If $\hat{\boldsymbol{u}}_{\boldsymbol{it}}$ is the $_{it}^{\text{th}}$ residual from the OLS regression, then the Lagrange multiplier test for one-way random effects is:

$$LM = \frac{NT}{2\,(T-1)}\left[\frac{\sum_{i=1}^{N}[\sum_{t=1}^{T}\hat{u}_{it}]^2}{\sum_{i=1}^{N}\sum_{t=1}^{T}\hat{u}_{it}} - 1\right]^2$$

In which failure to reject the null hypothesis, i.e. the result is higher than 0.05, suggests that there are no significant differences across units and, thus, no panel effect, which means OLS regression has to be done instead.

III. F-Test

An F-test is any statistical test in which the test statistic has an F-distribution under the null hypothesis. It is most often used when comparing statistical models that have been fitted to a data set, in order to identify the model that best fits the population from which the data was sampled. Sir Ronald A. Fisher initially developed the statistic as the variance ratio in the 1920s (Lomax, 2007). Suppose the fixed effects model is formulated as follows:

$$\gamma_{it} = X'_{it}\boldsymbol{\beta} + u_i + \varepsilon_{it}$$

The null hypothesis of the F-test following fixed effects regression is that in the proposed model, the observed and unobserved fixed effects ($\boldsymbol{u_i + \varepsilon_{it}}$) are equal to zero, i.e. they are equal across all units. Therefore, rejecting this hypothesis, when Prob>F is equal or less than 0.05, means that the fixed effects are non-zero, so the composite error terms ($\boldsymbol{u_i + \varepsilon_{it}}$) are correlated.

IV. Testing for Time-Fixed Effects (Testparm)

Finally, in order to see if time fixed effects are needed when running a fixed effects model, a joint test is needed to check whether the time dummies for all years are equal to zero or not (Torres-Reyna, 2007). If so, no time fixed effects are needed. On the other hand. if the Prob>F is equal or less than 0.05, the null hypothesis is rejected, meaning that coefficients for all years are not jointly equal to zero and, thus, time fixed effects have to be added to the model.

was used to test the second and third models for fixed effects, and found that the fixed effects model had to be used in both models, not the OLS regression (*Table 2-13*). Finally, using Testparm for time-fixed effects, time fixed effects' dummies had to be included in the second model, while there was no need to add such dummies into the third model (*Table 2-13*).

2.4.4 Results and Discussion

This sub-section illustrates the main results drawn from the three regression models used in this study, in which the coefficient values and P-values (in brackets) are presented and discussed. For each model, variables were statistically evaluated by their P-value, which was considered highly significant at 0.01, significant at 0.05, or marginally significant at 0.1. The coefficient value, on the other hand, represents the average change in the dependent variable for one unit of change in the predictor variable while holding other predictors in the model constant. The first two regression models used Return on Assets (ROA) and Return on Equity (ROE)as a dependent variable respectively, while the third model used an insurance-related dependent variable, the adjusted combined ratio, as follows:

$$\boldsymbol{ROA_{it}} = \beta_0 + \beta_1*BRDSIZE\_LN + \beta_2*INED + \beta_3*BRDNONDLTY + \beta_4*EDTNR + \beta_5*INEDTNR + \beta_6*BUSYINEDOUTDIR + \beta_7*EDBONUS2ED + \beta_8*EDOWN + \beta_9*MJRSHRHLDRS + \beta_{10}*AUDITORIND + \beta_{11}*FSIZE\_LN\_A + \beta_{12}*LVRG\_DE + \beta_{13}*LIFE + \beta_{14}*NONLIFE + \beta_{15}*LAG\_FINCRIS + \beta_{16}*LAG\_UKSOFTMAR + \alpha + \mu_i + \varepsilon_{it} \quad \textbf{Model 01}$$

$$\boldsymbol{ROE_{it}} = \beta_0 + \beta_1*BRDSIZE\_LN + \beta_2*INED + \beta_3*BRDNONDLTY + \beta_4*EDTNR + \beta_5*INEDTNR + \beta_6*BUSYINEDOUTDIR + \beta_7*EDBONUS2ED + \beta_8*EDOWN + \beta_9*MJRSHRHLDRS + \beta_{10}*AUDITORIND + \beta_{11}*FSIZE\_LN\_A + \beta_{12}*LVRG\_DE + \beta_{13}*LIFE + \beta_{14}*NONLIFE + \beta_{15}*LAG\_FINCRIS + \beta_{16}*LAG\_UKSOFTMAR + yYEAR + \alpha_i + \varepsilon_{it} \quad \textbf{Model 02}$$

$$\boldsymbol{ADJCOMBND_{it}} = \beta_0 + \beta_1*BRDSIZE\_LN + \beta_2*INED + \beta_3*BRDNONDLTY + \beta_4*EDTNR + \beta_5*INEDTNR + \beta_6*BUSYINEDOUTDIR + \beta_7*EDBONUS2ED + \beta_8*EDOWN + \beta_9*MJRSHRHLDRS + \beta_{10}*AUDITORIND + \beta_{11}*FSIZE\_LN\_A + \beta_{12}*LVRG\_DE + \beta_{13}*LIFE + \beta_{14}*NONLIFE + \beta_{15}*LAG\_FINCRIS + \beta_{16}*LAG\_UKSOFTMAR + \alpha_i + \varepsilon_{it} \quad \textbf{Model 03}$$

Where:

ROA*, *ROE & ADJCOMBND: *are the dependent variables, and* ***BRDSIZE_LN, INED, BRDNONDLTY, EDTNR, INEDTNR, BUSYINEDOUTDIR, EDBONUS2ED, EDOWN_w, MJRSHRHLDRS, AUDITORIND***: *are the independent variables.*

FSIZE_LN_A, LVRG_DE, LIFE, NONLIFE, LAG_FINCRIS, LAG_UKSOFTMAR: *are the control variables.*

$\boldsymbol{\beta_0}$: *is the intercept term, and* $\boldsymbol{\beta_1}$ **to** $\boldsymbol{\beta_{12}}$: *are the regression coefficients for independent variables.*

α_i: *is a group-specific constant term.*

μ_i: is a group-specific random element.

ε_{it}: is the error term, i: is index for entity, and t: is index for time.

I. Main Regression Results

Table 2-14, below, is a table of the main regression results for corporate governance arrangements and control variables with each of the three performance proxies. As shown in this table, different results were associated with each model.

Table 2-14: Regression Results

	VARIABLES	Model 01 RE ROA	Model 02 FE ROE	Model 03 FE ADJCOMBND
H1	Board Size LN	-0.001 (0.966)	0.047 (0.668)	-0.274 (0.475)
H2	Independent NED Ratio	-0.020 (0.586)	-0.092 (0.662)	-0.583 (0.405)
H3	Board Non-Duality	-0.003 (0.895)	0.108 (0.395)	0.336 (0.410)
H4	ED Tenure	0.001 (0.276)	0.0148* (0.056)	-0.015 (0.556)
H5	INED Tenure	-0.00411** (0.012)	-0.0348*** (0.000)	0.011 (0.720)
H6	INED Outside Directorships Average	0.002 (0.411)	-0.011 (0.413)	-0.068 (0.137)
H7	ED Bonus to ED Compensation Ratio	0.017 (0.343)	0.247** (0.023)	-0.406 (0.269)
H8	ED Ownership Ratio	0.141** (0.035)	0.830 (0.169)	-0.838 (0.667)
H9	Major Shareholders (3%) Ratio	0.012 (0.417)	0.070 (0.454)	-0.181 (0.563)
H10	External Auditor Independence Ratio	-0.024 (0.138)	-0.070 (0.436)	0.066 (0.831)
	Firm Size (Assets LN)	0.007 (0.225)	0.097 (0.137)	0.010 (0.960)
	Debt to Equity Ratio	0.000 (0.812)	-0.004 (0.197)	0.012 (0.310)
	Life Dummy	0.007 (0.644)	0.016 (0.897)	-0.021 (0.958)
	Non-Life Dummy	0.0590** (0.017)	.3599** (0.039)	0.032 (0.950)
	LAG Financial Crisis (2007-09)	-0.0150** (0.013)	-0.069 (0.260)	0.087 (0.434)
	LAG Insurance Cycle (Soft)	-0.0191*** (0.001)	-0.109 (0.116)	0.098 (0.374)
	Country FE	**-**	**YES**	**YES**
	Year FE	**-**	**YES**	**-**
	R-squared (within)	**0.2010**	**0.3945**	**0.0689**
	R-squared (between)	0.3576	0.0068	0.0029
	R-squared (overall)	0.2685	0.0651	0.0025

pval in parentheses

****** p<0.01, ** p<0.05, * p<0.1***

- **H_1: Board Size**

As seen in *Table 2-14*, the natural logarithm of board size had no impact on firm performance, which meant that the first hypothesis (H_1) was rejected, and that board size did not affect firm performance in any way. This result was consistent with previous studies of (Bhagat and Black, 1997; Connelly and Limpaphayom, 2004; Wintoki, Linck and Netter, 2012; Andreou, Louca and Panayides, 2014) found no meaningful relationship between board size and performance, meaning that board size does not matter but boar quality does, such as the ratio of independent non-executives, board non-duality, board tenure, board age, the average outside directorships for independent non-executives, the financial and/or insurance experience, etc. However, this was inconsistent with the agency theory assumption that smaller board size avoids poor coordination and communications and, thus, reduces agency costs (Jensen, 1993; Yermack, 1996), and with the resource dependence theory, which claims that larger boards improve linkages with external knowledge, skills and capital sources and, thus, reduce agency costs and improve firm performance (Pfeffer and Salancik, 1978; Johnson, Daily and Ellstrand, 1996; Dalton *et al.*, 1998; Hillman, Canella and Paetzold, 2000).

- **H_2: Independent Non-Executive Ratio**

It is clear from *Table 2-14* that the ratio of independent non-executive directors also had no relationship with firm performance, which rejected the second hypothesis (H_2). This result was consistent with the findings of Vegas and Theordorou (1998) and Weir and Laing (1999) found no relationship between the proportion of non-executive directors and corporate performance in the UK. It means that independence and external experience of non-executives could not help improving firm performance, while the dependence and experience of executives might do. (might be because the average INED is 38% which is less than majority, but not to the level to negatively affect performance). On the other hand, it was inconsistent with agency theory, which argues that larger proportions of independent NEDs enhance independent decisions, develop monitoring services and increase expert knowledge (Cadbury, 1992; Haniffa and Hudaib, 2006; Chhaochharia and Grinstein, 2009; Baranchuk and Dybvig, 2009). The results were also inconsistent with previous studies, which have stated that higher proportions of independent NED's might lower firm performance, as those directors are part-time employees unfamiliar with firm operations (Agrawal and Knoeber, 1996; Yermack, 1996; Bhagat and Black, 1997).

- **H_3: Board Non-Duality**

Hypothesis (H_3) was also rejected, as the results showed that board duality had no impact on firm performance, as seen in *Table 2-14*. This result was inconsistent with agency theory and prior research suggesting that no one director should have unlimited power in the decision-making process as, otherwise, the board might not be able to manage the company

independently and effectively (see Fama and Jensen, 1983; Cadbury, 1992; Diacon and O'sullivan, 1995; Gul and Leung, 2004; FRC, 2014). This weird result might be due to various interactions with other governance mechanisms that potentially affect the way CEO non-duality would improve performance, such as board independence, board ownership, CEO ownership, and shareholders ownership, (Kim and Buchanan, 2008).

- **H_4: Executive Directors' Tenure Length**

The tenure length for executive directors (ED Tenure) was found to have a statistically marginal significant effect on ROE only, in which, according to *Table 2-14*, a 1% increase in ED tenure led to 0.015% improvement in ROE. This result confirmed the fourth hypothesis (H_4), suggesting that longer tenure length means increased board efficiency and, thus, helps to expand performance (Olson, 2000; Golden and Zajac, 2001; Vafeas, 2003; Dulewicz and Herbert, 2004).

- **H_5: Independent Non-Executive Tenure**

According to *Table 2-14*, the tenure of independent non-executives (INEDs) had a statistically significant impact on ROA and a highly significant effect on ROE, which confirmed the assumption of the fifth hypothesis (H_5). It has been shown from the results listed in *Table 2-14* that an extra year in the average number of years that independent non-executives stay on the board led to around 0.04% decline in ROE, while it was only 0.004% on the ROA. This result was consistent with agency theory, which claims that longer tenure would reduce the NEDs' independence, as their objectivity declines over time (O'sullivan and Wong, 1999; Huang *et al.*, 2011).

- **H_6: Outside Directorships Average for Independent Non-Executive Directors**

With regard to the outside directorships, *Table 2-14* shows no relationship with any performance measure, which thus rejected the proposed hypothesis (H_8) and confirmed other prior studies (Klein, 1998; Weir, Laing and McKnight, 2002), which suggests that outside directorships might not be a proper indicator of the quality of non-executives, while their financial and insurance experience might do, which needs to be investigated in further research. This result was inconsistent with the Resource dependence theory and other prior studies, which have found that a board with directors having multiple outside directorships would facilitate access to resources critical to improve firm performance (Dowen, 1995; Ferris, Jagannathan and Pritchard, 2003; Huang *et al.*, 2011; Andreou, Louca and Panayides, 2014), while too many directorships, according to the agency theory, may negatively affect the monitoring role of busy outside directors, and thus, lower firm performance (Shivdasani, 1993; Core, Holthausen and Larcker, 1999; Fich and Shivdasani, 2006).

- **H_7: Bonus Ratio for Executive Directors**

Table 2-14 shows a statistically significant impact of the bonus ratio paid to executive directors on ROE, which confirmed the proposed hypothesis (H_6). As is clear from *Table 2-14*, a 1% rise in the bonus led to improved firm performance by 0.25%. This was consistent with the findings of (Amess and Drake, 2003), who argued that board members should be remunerated in order to motivate them to serve shareholders' interests, as they play an important role in reducing the opportunistic behaviour of senior executives (Jensen, 1993; John and Senbet, 1998).

- **H_8: Ownership Ratio for Executive Directors**

It can be seen from *Table 2-14* that ED ownership ratio had a statistically positive significant impact on ROA, which confirmed the suggested hypothesis (H_7). *Table 2-14* shows that 1% increase in the ownership ratio of executives led to 0.14% growth in ROA. This result supported the alignment of interest hypothesis (Jensen and Meckling, 1976), by which managers who own shares in the company would reduce agency costs and improve firm performance by aligning their interests to other shareholders' and, thus, they have less incentive for opportunistic behaviour. (see also Morck, Shleifer and Vishny, 1988; Yermack, 1996; Huang, Hsiao and Lai, 2007; Bhagat and Bolton, 2008).

- **H_9: Major Shareholders (3%) Ratio**

Based on the results of *Table 2-14*, major shareholders had no statistically significant impact on firm performance, which rejected hypothesis (H_9). This was inconsistent with the findings of Fama and Jensen (1983), Shleifer and Vishny (1986a), and Leech and Leahy (1991), who claimed that large shareholders have more incentive and greater ability to monitor the managers for the shared interest of all shareholders, while it was consistent with the findings of Agrawal and Knoeber (1996), Karpoff, Malatesta and Walkling (1996), Short and Keasey (1999)and Faccio and Lasfer (2000), who found no such significant relationship.

- **H_{10}: External Auditor Independence Ratio**

According to *Table 2-14*, no relationship was found between the independent auditors and firm performance, which rejected the last hypothesis (H_{10}). This was inconsistent with the previous literature, which argued that independent auditors contributed to effective corporate governance (Defond, Francis and Wong, 2000). Moreover, other studies even found a positive relationship between the ratio for non-audit fees, i.e. a negative impact of the independence ratio, and firm performance (Defond, Raghunandan and Subramanyam, 2002; Schroeder and Hamburger, 2002)

On the other hand, the control variables also had different results amongst the three regression models, as noticed from *Table 2-14*. Firstly, it can be observed from *Table 2-14* that firm size, estimated by the natural logarithm of total assets, had no significant effect on firm performance. The results also showed a non-significant association between financial leverage, measured by debt to equity ratio, and firm performance (*Table 2-14*). With regard to the insurance line, *Table 2-14* shows that the Life dummy had no impact on firm performance, while, on the other hand, the non-life dummy had a significant effect on ROA and ROE. Therefore, selling only non-life insurance products helped firms to improve ROA by 0.06% and ROE by 0.36%. Finally, in terms of financial and insurance cycles, the financial crisis of 2007–09[29] is considered by many economists to have been the worst financial crisis since the Great Depression of the 1930s (Crotty, 2009). This crisis had a statistically significant effect on ROA only, which shrunk by 0.015% during the financial crisis (see *Table 2-14*). On the other hand, it is clear from the results shown in *Table 2-14* that insurers suffered from a 0.02% decline in ROA during the soft phases of the insurance cycle[30].

[29] The financial crisis of 2007–09, also known as the Global Financial Crisis and 2008 financial crisis, is considered by many economists to have been the worst financial crisis since the Great Depression of the 1930s (Crotty, 2009).

[30] Soft market has lower premiums, broader coverage, easier underwriting, more policies, and increased competition among insurers, while in the hard market; the premiums are higher with more strict underwriting criteria, fewer written policies and less competition as well. (Niehaus and Terry, 1993; Kunreuther, Michel-Kerjan and Ranger, 2011; Lee and Chiu, 2012; Wang et al., 2013; English, 2013; Sephton and Mann, 2014; Browne, Ju and Tu, 2014).

III. Regression Results for Sub-Samples

The main purpose of this section was to give more insights into the effectiveness of corporate governance arrangements used by insurance line (life, non-life and composite), quoting type (listed, non-listed), the Financial Crisis of 2007-09 (prior, throughout and following), and finally, the underwriting insurance cycle (soft and hard markets). A second objective was to see if there is any difference in the compliance level among those sub-samples, leading to different governance strategies to be used by insurance companies

Below are the regression results for the following sub-samples (*Table 2-15*); firstly, Life, non-life and composite insurance (*Table 2-16*); secondly, listed and non-listed companies (*Table 2-18*); thirdly, before, during and after financial crisis 2007-09 (*Table 2-20*); and, finally, soft or hard insurance markets (*Table 2-22*).

Table 2-15: Summary of the Regression Results for the Whole Sample and Sub-Samples

	VARIABLES	Expected	Main	Life	Non-Life	Composite	Listed	Non-Listed	Pre-Fin	During-Fin	Post-Fin	Soft	Hard
H1	Board Size LN	+	.	.	+	.	+	.	+	.	.	.	+
H2	Independent NED Ratio	+	.	.	-	.	-	.	.	.	+	+	.
H3	Board Non-Duality	+	.	.	.	.	.	.	.	+	+	.	.
H4	ED Tenure	+	+	+	+	.	.	.	+	+	+	.	+
H5	INED Tenure	-	-	-	.	+	-	-	.	-	-	-	.
H6	INED Outside Directorships Average	+	.	-	.	+	.	-	.	-	+	+	.
H7	ED Bonus to ED Compensation Ratio	+	+	.	-	.	+	.	.	+	+	+	.
H8	ED Ownership Ratio	+	+	.	+	.	+	.	.	.	+	.	.
H9	Major Shareholders (3%) Ratio	+	.	.	-	.	.	-	.	.	-	.	.
H10	External Auditor Independence Ratio	+	.	.	-	+	-	-	.	-	.	-	.
	Firm Size (Assets LN)	+	.	.	.	+	.	.	.	.	+	.	.
	Debt to Equity Ratio	-	.	-	-	.	.	-	.	.	-	.	+
	Life Dummy	.	.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Non-Life Dummy	.	+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	LAG Financial Crisis (2007-09)	-	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	LAG Insurance Cycle (Soft)	-	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

- ***Life, Non-Life and Composite Insurance Companies***

It is obvious from *Table 2-16* that most corporate governance arrangements affected firm performance, measured by ROA, in non-life insurance companies, while there was no such impact on companies that sold life insurance. This result can be explained, according to (Desender, 2009; Desender *et al.*, 2013), by the agency theory that clarifies how large controlling shareholders, with none or low managerial ownership, solve the managers-shareholders conflicts, rather than using the board to add an additional layer of monitoring, as they have both ability and incentives to monitor management team themselves. On the other hand, increased managerial ownership would help to align the interests of shareholders and managers, from the agency perspective, leading to improved performance, the '*incentive alignment effect*', (Jensen and Meckling, 1976; Yermack, 1996; Saker and Saker, 2000; Huang, Hsiao and Lai, 2007; Morck, Shleifer and Vishny, 1988). However, the strength of this relationship will decline with the increase in managerial ownership, the '*entrenchment effect*', in which managers are more likely to reduce the level of information about their governance practices, and thus, shareholders find it hard to control such managers' activities themselves (Morck, Shleifer and Vishny, 1988; Hermalin and Weisbach, 1988; Mcconnell and Servaes, 1990; Holderness, Kroszner and Sheehan, 1999; Hussainey and Al-Najjar, 2012). *Table 2-17* shows that although non-life companies have slightly larger controlling shareholders, than life companies, and thus, they might have more incentives and ability to monitor managers themselves, a higher ratio of managerial ownership in non-life insurers have made the monitoring task harder for shareholders, and raise the need for the board of directors to do it effectively.

Table 2-16: Summary of Regression Results for Life, Non-Life & Composite Insurance Companies

	VARIABLES	Model 01 RE ROA			Model 02 FE ROE			Model 03 FE ADJCOMBND		
		L	NL	C	L	NL	C	L	NL	C
H1	Board Size LN	0.013	0.0564*	-0.043	0.112	0.065	0.102	0.455	-0.766	0.136
		(0.234)	(0.059)	(0.221)	(0.595)	(0.622)	(0.778)	(0.234)	(0.455)	(0.843)
H2	Independent NED Ratio	-0.002	-0.229***	0.102	0.204	-0.754**	0.551	0.249	-1.555	0.766
		(0.918)	(0.005)	(0.176)	(0.624)	(0.015)	(0.398)	(0.737)	(0.418)	(0.557)
H3	Board Non-Duality	0.015	0.004	-0.006	-	-0.071	0.116	-	-0.088	0.767
		(0.504)	(0.941)	(0.855)		(0.595)	(0.620)		(0.916)	(0.104)
H4	ED Tenure	0.00251***	0.00439**	0.005	0.0261**	0.0249**	0.012	-0.025	0.001	-0.045
		(0.000)	(0.028)	(0.115)	(0.031)	(0.041)	(0.729)	(0.215)	(0.985)	(0.422)
H5	INED Tenure	-0.00169*	-0.004	0.00981*	-0.0593***	-0.013	0.059	-0.003	0.055	-0.031
		(0.099)	(0.183)	(0.051)	(0.004)	(0.187)	(0.177)	(0.921)	(0.356)	(0.707)
H6	INED Outside Directorships Average	0.000	0.006	0.00854**	-0.0608*	0.000	-0.005	-0.066	-0.051	-0.025
		(0.698)	(0.119)	(0.044)	(0.094)	(0.982)	(0.917)	(0.299)	(0.594)	(0.754)
H7	ED Bonus to ED Compensation Ratio	-0.005	-0.0622***	0.053	0.244	0.140	0.472	-0.089	-0.565	-0.829
		(0.701)	(0.008)	(0.173)	(0.344)	(0.149)	(0.122)	(0.849)	(0.354)	(0.211)
H8	ED Ownership Ratio	-0.020	0.215***	0.070	-3.896	0.183	1.382	8.165	-3.538	-1.623
		(0.394)	(0.003)	(0.462)	(0.828)	(0.895)	(0.105)	(0.782)	(0.695)	(0.284)

	VARIABLES	Model 01 RE ROA			Model 02 FE ROE			Model 03 FE ADJCOMBND		
		L	NL	C	L	NL	C	L	NL	C
H9	Major Shareholders (3%) Ratio	-0.001	-0.238***	-0.029	0.149	-0.137	-1.027	-0.005	-1.273	1.157
		(0.951)	0.000	(0.410)	(0.283)	(0.554)	(0.271)	(0.983)	(0.464)	(0.454)
H10	External Auditor Independence Ratio	-0.012	-0.101***	0.016	0.096	-0.234**	-0.433	-0.268	0.521	-0.971*
		(0.217)	(0.005)	(0.687)	(0.604)	(0.011)	(0.234)	(0.430)	(0.376)	(0.089)
	Firm Size (Assets LN)	-0.001	-0.012	0.001	0.221	0.086	0.551*	-0.019	0.195	0.111
		(0.516)	(0.148)	(0.867)	(0.221)	(0.175)	(0.065)	(0.922)	(0.625)	(0.797)
	Debt to Equity Ratio	-0.000399**	-0.0161***	0.000	-0.009	-0.026	-0.003	0.0268*	-0.065	-0.006
		(0.040)	(0.001)	(0.235)	(0.257)	(0.165)	(0.600)	(0.056)	(0.551)	(0.627)
	Country FE	-	-	-	YES	YES	YES	YES	YES	YES
	Year FE	-	-	-	YES	YES	YES	-	-	-
	R-squared (within)	**0.1355**	**0.2151**	**0.3174**	**0.4405**	**0.5909**	**0.9172**	**0.2263**	**0.1130**	**0.3154**
	R-squared (between)	**0.7629**	**0.7572**	**0.9021**	**0.1319**	**0.2610**	**0.2089**	**0.3673**	**0.0525**	**0.1473**
	R-squared (overall)	**0.3292**	**0.5934**	**0.4049**	**0.0525**	**0.1204**	**0.0718**	**0.1458**	**0.0230**	**0.3642**

pval in parentheses
****** p<0.01, ** p<0.05, * p<0.1***

Where L: Life, NL: Non-Life, C: Composite

Firstly, it is clear from *Table 2-16* that board size in non-life companies had a positive marginal effect on ROA, which increased by 0.06% due to higher return on assets compared to life and composite companies (*Table 2-17*). The ratio of independent non-executive directors (INED), on the other hand, negatively affected both ROA and ROE; -0.23% and -0.75% respectively, in non-life companies only (*Table 2-16*). Indeed, *Table 2-17* shows that INED for non-life companies was only 35% on average, while it ranged from 40% - 55% for life and composite companies, which might explain the negative effect of this ratio for non-life companies.

Moreover, it can be seen from the same table that tenure length of executives had a positive impact on ROA and ROE for insurance companies that sold life only or non-life only products, while it was ineffective for composite products, which might be due to shorter tenure and, thus, less opportunist behaviour than in composite companies (*Table 2-17*). On the other hand, although negatively affecting life companies, the role of tenure length for non-executives positively affected ROA in composite companies (*Table 2-16*). According to *Table 2-17* , the maximum tenure for non-executives (NEDs) in composite companies did not exceed 10 years, meaning that all NEDs were still considered as independents, according to the UK Corporate Governance Code (FRC, 2003; FRC, 2006; FRC, 2008; FRC, 2010; FRC, 2012b). The average number of outside directorships for independent non-executives had a negative impact on ROE in life insurance companies, which became a positive effect for ROA in composite companies (*Table 2-16*). This was because the average number of outside directorships in composite companies was quite small (3.50), with maximum number of up to 10.50 only, compared to other life and non-life companies (*Table 2-17*).

In terms of financial incentives, the impact of bonuses was negative on the ROA of non-life companies, while the ownership ratio of executive had a positive effect (*Table 2-16*). It is clear from *Table 2-17*. that, although there was no big difference in the bonus ratio among life, non-life and composite companies, the average remuneration for executives, on which this ratio was based, was, the smallest for non-life companies, £230K, compared to life and composite companies, £279K and £253K respectively (*Table 2-17*). On the other hand, *Table 2-17* shows a higher board ownership ratio in non-life companies (4.50%), compared to life and composite, which led to higher shares being paid to executives in non-life companies, even though the ownership ratios in both non-life and composite were similar; 1.90% and 1.78%. This strange result might be explained by the earnings volatility in non-life insurance companies, as most policies run for an average of one year, while life policies run for between 10 to 25 years. Therefore, non-life insurance firms tend to reward their directors in shares to retain their loyalty and motivation. Major shareholders, however, had a negative effect on ROA by 0.24% in non-life insurance companies, where the ratio increased by 1% (*Table 2-16*).

According to *Table 2-17*, major shareholders in non-life companies had the highest ratio compared to life and composite, 83%, which might have resulted in more conflicts with executives, who also had the highest managerial ownership ratio, 4.50%, leading to a negative effect on firm performance. Finally, regarding the external auditor, it is seen from *Table 2-16*. that a 1% increase in the auditor independence ratio, measured by audit fees to total fees, led to drops in the ROA and ROE of non-life insurers, 0.1% and 0.2% respectively, and growth in the operating performance, measured by the adjusted combined ratio, of composite insurers by around 1% (*Table 2-16*). This strange result might be explained by the optimal combination of audit and non-audit fees in order for the auditor to gain competencies by providing non-audit services and retain its independence at the same time. Indeed, it is clear from *Table 2-17* that the 71% independence ratio would help composite companies to improve firm performance, while the rise of this ratio to 77% in non-life companies affected performance negatively (*Table 2-17*). However, although auditors in life insurance are less independent than non-life and composite, no obvious impact on firm performance was found, which might be explained by the high percentage of life companies using one of the big four audit firms (98%), which strictly retain their independence.

Table 2-17: Descriptive Statistics for Life, Non-Life and Composite Insurance Firms

VARIABLES	LIFE			NONLIFE			COMPOSITE		
variable	Mean	Median	Max	Mean	Median	Max	Mean	Median	Max
ROA	**0.72%**	**0.61%**	**8.70%**	**4.21%**	**3.10%**	**33.20%**	**0.81%**	**0.66%**	**9.19%**
ROE	**13.07%**	**13.69%**	**86.43%**	**15.04%**	**12.73%**	**83.04%**	**7.84%**	**11.60%**	**34.72%**
COMBND	263.14%	172.18%	1496.88%	100.23%	98.08%	448.91%	135.93%	121.36%	618.67%
ADJCOMBND	**77.56%**	**67.53%**	**390.91%**	**91.77%**	**89.58%**	**741.79%**	**100.98%**	**81.70%**	**536.31%**
FSIZE_LN_S	**6.75**	**6.58**	**10.96**	**6.40**	**6.46**	**10.08**	**7.55**	**7.04**	**10.97**
FSIZE_LN_A	15.76	15.69	19.60	13.96	14.14	17.14	15.82	14.60	19.73
LVRG_DE	**25.04**	**17.40**	**117.84**	**3.45**	**3.38**	**14.10**	**13.95**	**5.08**	**69.76**
LVRG_DA	91.21%	95.12%	100.00%	68.31%	77.16%	93.38%	82.36%	83.56%	98.59%
SLVNCY_EA	9.49%	5.32%	99.30%	32.28%	22.91%	100.00%	17.64%	16.44%	66.06%
BRDSIZE	**8.61**	**8.00**	**17.00**	**8.32**	**8.00**	**22.00**	**10.69**	**11.00**	**16.00**
INED	**40.05%**	**44.95%**	**90.00%**	**35.28%**	**37.50%**	**70.00%**	**45.91%**	**54.55%**	**72.73%**
BRDNONDLTY	**83.94%**	**100.00%**	**100.00%**	**82.57%**	**100.00%**	**100.00%**	**96.10%**	**100.00%**	**100.00%**
EDTNR	**3.78**	**3.22**	**15.33**	**4.37**	**3.85**	**12.16**	**4.98**	**4.56**	**10.71**
INEDTNR	**3.41**	**3.21**	**14.82**	**3.73**	**3.22**	**16.57**	**4.29**	**4.10**	**9.69**
BUSYNESSBRD	67.96%	71.43%	100.00%	64.21%	66.67%	100.00%	76.38%	81.82%	100.00%
BUSYBRDOUTDIR	5.44	4.43	19.50	8.91	3.71	232.75	3.59	3.42	7.50
BUSYEDOUTDIR	6.57	4.67	26.00	5.24	4.00	22.00	3.96	3.70	9.00
BUSYINEDOUDIR	**4.31**	**4.00**	**23.00**	**4.80**	**3.50**	**26.00**	**3.53**	**3.00**	**10.50**
BRDREMAV	279.26	212.87	1,271.24	229.74	179.14	948.72	252.83	151.00	652.25
EDREM	80.02%	81.98%	93.39%	77.06%	83.59%	100.00%	80.66%	82.38%	89.54%
HPAIDDIR	36.88%	33.07%	93.01%	38.12%	33.37%	93.83%	34.73%	31.83%	70.79%
EDBONUS2ED	**36.42%**	**38.92%**	**84.94%**	**36.18%**	**33.48%**	**100.00%**	**33.46%**	**41.16%**	**63.65%**
EDBONUS2REM	30.36%	34.17%	75.02%	28.50%	26.24%	74.44%	27.49%	31.33%	53.66%
BRDOWN	0.13%	0.00%	2.28%	4.50%	0.00%	83.94%	1.31%	0.00%	71.80%
EDOWN	**0.07%**	**0.00%**	**1.54%**	**1.90%**	**0.00%**	**42.16%**	**1.78%**	**0.00%**	**71.80%**
MAINSHRHLDR	60.51%	100.00%	100.00%	77.46%	100.00%	100.00%	69.81%	100.00%	100.00%
BLKSHRHLDRS	62.20%	100.00%	100.00%	81.21%	100.00%	100.00%	69.98%	100.00%	100.00%
MJRSHRHLDRS	**63.98%**	**100.00%**	**100.00%**	**83.21%**	**100.00%**	**100.00%**	**73.18%**	**100.00%**	**100.00%**
AUDITORBIG4	98.17%	100.00%	100.00%	92.59%	100.00%	100.00%	79.22%	100.00%	100.00%
AUDITORIND	**67.56%**	**69.27%**	**100.00%**	**77.11%**	**79.69%**	**100.00%**	**71.27%**	**72.66%**	**100.00%**

Where ROA: Return on Assets, ROE: Return on Equity, COMBND: Combined Ratio, ADJCOMBND: Adjusted Combined Ratio, FSIZE_LN_S: Firm Size=Ln(Staff), FSIZE_LN_A: Firm Size=Ln(Total Assets), LVRG_DE: Financial Leverage (Total Debt/Total Equity) , LVRG_DA: Financial Leverage (Total Debt/Total Assets), SLVNCY_EA: Solvency Ratio (Equity/Assets), BRDSIZE: Board Size, INED: Ratio of Independent Non-Executive Directors, BRDNONDLTY: Board Non-Duality, EDTNR: Average Tenure Length for Executives, INEDTNR: Average Tenure Length for Non-Executives, BUSYNESSBRD: Busy Directors Ratio, BUSYBRDOUTDIR: Board Out directorship Ratio, BUSYEDOUTDIR: Executives Out directorship Ratio, BUSYINEDOUDIR: Independent Non-Executives Out directorship Ratio, BRDREMAV: Average Board Remuneration, EDREM: Executives Remuneration Ratio, HPAIDDIR: Highest Paid Director Ratio, EDBONUS2ED: ED Bonus to ED Remuneration, EDBONUS2REM: ED Bonus to Board Remuneration, BRDOWN: Board Ownership Ratio, EDOWN: Executives Ownership Ratio, MAINSHRHLDR: Main Shareholder Ratio, BLKSHRHLDRS: Block Shareholders Ratio (5%), MJRSHRHLDRS: Major Shareholders Ratio (3%), AUDITORBIG4: Auditor from Big 4 Audit Firms, AUDITORIND: Auditor Independence Ratio.

- ***Regression Results for Listed and Non-Listed Insurance Companies***

When comparing listed and non-listed companies, the results shown in (*Table 2-18*) indicate that listed companies were more sensitive to the changes in corporate governance arrangements than non-listed companies. This result can also be explained by the agency theory, in which large controlling shareholders, with none or low managerial ownership, as the case of non-listed companies (*Table 2-19*), would have the incentives as well as the ability to monitor the managers' activities (Desender, 2009; Desender *et al.*, 2013). On the other hand, lower controlling shareholders ratio for listed companies (48.20%), with relatively high managerial ownership (4.35%), as shown in *Table 2-19*, will increase the 'entrenchment effect', in which shareholders find it hard to monitor and control managers' activities without using internal governance arrangements. (Morck, Shleifer and Vishny, 1988; Hermalin and Weisbach, 1988; Mcconnell and Servaes, 1990; Holderness, Kroszner and Sheehan, 1999; Hussainey and Al-Najjar, 2012).

Table 2-18: Summary of Regression Results for Listed and Non-Listed Insurance Companies

	VARIABLES	Model 01 RE ROA		Model 02 FE ROE		Model 03 FE ADJCOMBND	
		L	NL	L	NL	L	NL
H1	Board Size LN	0.0409**	-0.065	0.144	-0.322	-0.357	-0.074
		(0.018)	(0.177)	(0.114)	(0.441)	(0.362)	(0.813)
H2	Independent NED Ratio	-0.0991**	0.009	-0.394*	-0.275	-0.670	-0.729
		(0.011)	(0.914)	(0.058)	(0.712)	(0.408)	(0.203)
H3	Board Non-Duality	0.009	-	0.151	-	0.204	-
		(0.637)		(0.133)		(0.625)	
H4	ED Tenure	0.001	0.002	0.009	0.012	0.005	0.001
		(0.665)	(0.318)	(0.258)	(0.515)	(0.865)	(0.934)
H5	INED Tenure	-0.00417***	-0.003	-0.0170**	-0.0803**	0.027	-0.021
		(0.010)	(0.570)	(0.047)	(0.040)	(0.426)	(0.483)
H6	INED Outside Directorships Average	0.003	-0.0103*	0.005	-0.055	-0.059	-0.029
		(0.237)	(0.084)	(0.701)	(0.352)	(0.225)	(0.451)
H7	ED Bonus to ED Compensation Ratio	0.004	0.082	0.255***	0.366	-0.617*	-0.006
		(0.809)	(0.128)	(0.004)	(0.385)	(0.084)	(0.987)
H8	ED Ownership Ratio	0.145**	-	0.627	-	-0.892	-
		(0.035)		(0.176)		(0.512)	
H9	Major Shareholders (3%) Ratio	0.000	-0.001	0.006	-	0.182	0.496***
		(0.997)	(0.968)	(0.934)		(0.522)	(0.001)
H10	External Auditor Independence Ratio	-0.0376**	-0.0843**	-0.161**	0.056	0.364	-0.221
		(0.016)	(0.033)	(0.036)	(0.862)	(0.287)	(0.391)
	Firm Size (Assets LN)	-0.003	0.010	0.032	-0.208	-0.018	0.018
		(0.529)	(0.174)	(0.515)	(0.594)	(0.845)	(0.699)
	Debt to Equity Ratio	0.000	-0.002	-0.001	-0.006	-0.007	0.0371***
		(0.384)	(0.112)	(0.744)	(0.704)	(0.428)	(0.000)
	Country FE	**-**	**-**	**YES**	**YES**	**YES**	**YES**
	Year FE	**-**	**-**	**YES**	**YES**	**-**	**-**
	R-squared (within)	**0.2267**	**0.2020**	**0.4813**	**0.5335**	**0.0399**	**0.4886**
	R-squared (between)	**0.4045**	**0.2811**	**0.0852**	**0.1810**	**0.4841**	**0.0864**
	R-squared (overall)	**0.3749**	**0.2663**	**0.1650**	**0.0223**	**0.2793**	**0.5289**

pval in parentheses
****** p<0.01, ** p<0.05, * p<0.1***

Where: Listed, NL: Non-Listed

As can be seen from *Table 2-18*, board size, bonus ratio and ownership ratio of executives had positive effects on firm performance in listed companies. According to *Table 2-19*, the average board size in listed companies was higher, 10, with a maximum of 17 directors compared to non-listed companies; 8 and 22 respectively, which meant that board size in most listed companies had an optimal size that was required to efficiently release its directors' responsibilities. It is also clear that both the bonus ratio and the ownership ratio for executives were higher in listed than in non-listed companies (*Table 2-19*). However, the ratio of independent non-executives had a negative effect on firm performance in listed companies only (*Table 2-18*), which might be because those outsiders had longer tenure, which reduced their independence, compared to non-listed companies (*Table 2-19*). It was also noticed that the tenure length of independent non-executives negatively affected performance in non-listed more than listed companies (*Table 2-18*), which can be explained by the fact that non-listed companies had less independent outsiders (33%) who had more outside directorships (4.96), which makes them less efficient in releasing their duties as expected.

On the other hand, it is clear from *Table 2-18*. that busy independent non-executives and major shareholders affected firm performance negatively in non-listed companies. *Table 2-19* shows that independent non-executives in listed companies had less outside directorships, thus fewer links to outside resources, compared to non-listed companies, which means also more time to release their duties. Moreover, major shareholders owned up to 87% of outstanding shares in non-listed companies, while this ratio did not exceed 50% in the listed companies (*Table 2-19*), which meant more powerful concentrated shareholders in the non-listed companies, which negatively affected board operations and decisions.

Table 2-19: Descriptive Statistics for Listed and Non-Listed Insurance Firms

VARIABLES	Listed				Non-Listed			
	Mean	Median	Min	Max	Mean	Median	Min	Max
ROA	**3.83%**	**1.34%**	**-22.69%**	**31.76%**	**2.14%**	**1.48%**	**-22.24%**	**33.20%**
ROE	**17.30%**	**16.28%**	**-57.69%**	**76.63%**	**11.87%**	**11.38%**	**-67.23%**	**86.43%**
COMBND	165.15%	107.24%	52.24%	1435.71%	154.11%	102.18%	2.22%	1496.88%
ADJCOMBND	**85.05%**	**79.73%**	**3.36%**	**741.79%**	**89.34%**	**87.81%**	**0.03%**	**536.31%**
FSIZE_LN_S	**7.73**	**7.34**	**3.18**	**10.97**	**6.13**	**6.19**	**2.94**	**8.71**
FSIZE_LN_A	15.68	15.32	8.87	19.73	14.42	14.34	10.00	18.19
LVRG_DE	**13.71**	**4.93**	**0.01**	**69.76**	**10.63**	**4.23**	**0.16**	**117.84**
LVRG_DA	74.43%	83.17%	0.70%	99.72%	79.18%	81.50%	14.03%	100.00%
SLVNCY_EA	26.73%	16.96%	0.28%	100.00%	21.58%	18.95%	0.05%	85.97%
BRDSIZE	**9.89**	**10.00**	**2.00**	**17.00**	**8.20**	**8.00**	**2.00**	**22.00**
INED	**49.69%**	**50.00%**	**0.00%**	**90.00%**	**33.31%**	**33.33%**	**0.00%**	**77.78%**
BRDNONDLTY	**93.19%**	**100.00%**	**0.00%**	**100.00%**	**81.06%**	**100.00%**	**0.00%**	**100.00%**
EDTNR	**4.28**	**4.06**	**0.00**	**11.97**	**4.23**	**3.64**	**0.08**	**15.33**
INEDTNR	**3.85**	**3.80**	**0.00**	**11.74**	**3.62**	**3.06**	**0.00**	**16.57**
BUSYNESSBRD	72.51%	72.73%	37.50%	100.00%	64.58%	66.67%	0.00%	100.00%
BUSYBRDOUT~R	12.43	4.09	1.20	232.75	4.86	3.75	0.00	19.50
BUSYEDOUTDIR	6.50	5.00	0.67	22.00	5.15	3.80	0.00	26.00
BUSYINEDOU~R	**3.45**	**3.00**	**0.00**	**12.25**	**4.96**	**4.00**	**0.00**	**26.00**
BRDREMAV	353.49	335.80	6.48	1,271.24	201.77	157.58	3.33	917.67
EDREM	78.02%	82.23%	0.00%	96.97%	80.63%	82.27%	57.44%	100.00%
HPAIDDIR	33.55%	31.44%	17.49%	91.18%	38.98%	34.26%	7.09%	93.83%
EDBONUS2ED	**41.32%**	**43.84%**	**0.00%**	**100.00%**	**23.98%**	**24.48%**	**0.00%**	**54.22%**
EDBONUS2REM	33.07%	35.54%	0.00%	75.02%	21.83%	21.52%	0.00%	48.86%
BRDOWN	4.35%	0.22%	0.00%	54.29%	1.36%	0.00%	0.00%	83.94%
EDOWN	**1.91%**	**0.10%**	**0.00%**	**26.53%**	**0.83%**	**0.00%**	**0.00%**	**71.80%**
MAINSHRHLDR	32.75%	14.32%	0.00%	100.00%	86.54%	100.00%	0.00%	100.00%
BLKSHRHLDRS	41.14%	32.17%	0.00%	100.00%	86.77%	100.00%	0.00%	100.00%
MJRSHRHLDRS	**48.20%**	**40.47%**	**3.58%**	**100.00%**	**86.77%**	**100.00%**	**0.00%**	**100.00%**
AUDITORBIG4	90.16%	100.00%	0.00%	100.00%	94.05%	100.00%	0.00%	100.00%
AUDITORIND	**64.67%**	**60.74%**	**3.51%**	**100.00%**	**76.65%**	**78.59%**	**11.08%**	**100.00%**

Where ROA: Return on Assets, ROE: Return on Equity, COMBND: Combined Ratio, ADJCOMBND: Adjusted Combined Ratio, FSIZE_LN_S: Firm Size=Ln(Staff), FSIZE_LN_A: Firm Size=Ln(Total Assets), LVRG_DE: Financial Leverage (Total Debt/Total Equity) , LVRG_DA: Financial Leverage (Total Debt/Total Assets), SLVNCY_EA: Solvency Ratio (Equity/Assets), BRDSIZE: Board Size, INED: Ratio of Independent Non-Executive Directors, BRDNONDLTY: Board Non-Duality, EDTNR: Average Tenure Length for Executives, INEDTNR: Average Tenure Length for Non-Executives, BUSYNESSBRD: Busy Directors Ratio, BUSYBRDOUTDIR: Board Out directorship Ratio, BUSYEDOUTDIR: Executives Out directorship Ratio, BUSYINEDOUDIR: Independent Non-Executives Out directorship Ratio, BRDREMAV: Average Board Remuneration, EDREM: Executives Remuneration Ratio, HPAIDDIR: Highest Paid Director Ratio, EDBONUS2ED: ED Bonus to ED Remuneration, EDBONUS2REM: ED Bonus to Board Remuneration, BRDOWN: Board Ownership Ratio, EDOWN: Executives Ownership Ratio, MAINSHRHLDR: Main Shareholder Ratio, BLKSHRHLDRS: Block Shareholders Ratio (5%), MJRSHRHLDRS: Major Shareholders Ratio (3%), AUDITORBIG4: Auditor from Big 4 Audit Firms, AUDITORIND: Auditor Independence Ratio.

- ***Regression Results Before, During & After the Global Financial Crisis (2007-2009)***

With regard to the financial crisis of 2007-09, *Table 2-20* shows that corporate governance had a clear impact on performance during the crisis, and even more afterward. This is consistent with the findings of Peni and Vähämaa (2012) which have argued that good corporate governance might have mitigated the negative effect of the crisis. It is also observed that increased board independence (board non-duality and independent non-executives ratio), as shown in *Table 2-21*, has led to more equity capital (Solvency Ratio [Equity to Assets]) during the crisis, which led to a wealth transfer from existing shareholders to debtholders , illustrated by increased Debt to Equity Ratio (*Table 2-21*), as argued by Erkens, Hung and Matos (2012).

Table 2-20: Summary of Regression Results Before, During and After the Global Financial Crisis of 2007-09

	VARIABLES	Model 01 RE ROA			Model 02 FE ROE			Model 03 FE ADJCOMBND		
		B	D	A	B	D	A	B	D	A
H1	Board Size LN	0.0579*	-0.014	0.037	-0.013	-0.617	-0.084	0.034	0.463	-0.575
		(0.050)	(0.766)	(0.131)	(0.970)	(0.214)	(0.517)	(0.884)	(0.463)	(0.319)
H2	Independent NED Ratio	-0.034	0.024	0.013	-0.535	-0.235	-0.339	-0.303	-1.002	-3.062***
		(0.516)	(0.813)	(0.807)	(0.322)	(0.794)	(0.184)	(0.461)	(0.447)	(0.005)
H3	Board Non-Duality	-	0.219*	0.005	-	-	0.187*	0.487	2.562	0.602
			(0.098)	(0.820)			(0.061)	(0.414)	(0.167)	(0.254)
H4	ED Tenure	0.002	0.00671*	0.003	0.0166*	-0.026	-0.008	-0.0217*	-0.023	-0.0922**
		(0.153)	(0.058)	(0.133)	(0.096)	(0.404)	(0.523)	(0.068)	(0.648)	(0.015)
H5	INED Tenure	-0.003	-0.005	0.001	-0.050	-0.156***	-0.0207*	-0.036	-0.055	-0.036
		(0.401)	(0.206)	(0.785)	(0.317)	(0.001)	(0.069)	(0.139)	(0.292)	(0.519)
H6	INED Outside Directorships Average	-0.001	-0.003	0.002	-0.013	-0.169**	-0.006	-0.034	-0.096	-0.183***
		(0.836)	(0.586)	(0.514)	(0.889)	(0.026)	(0.647)	(0.319)	(0.208)	(0.001)
H7	ED Bonus to ED Compensation Ratio	-0.038	-0.008	0.018	-0.113	0.184	0.093	-0.045	-1.259**	-1.280**
		(0.119)	(0.845)	(0.453)	(0.664)	(0.562)	(0.472)	(0.829)	(0.039)	(0.013)
H8	ED Ownership Ratio	0.032	-0.068	0.054	-0.617	10.640	1.118**	0.856	-1.789	-1.730*
		(0.730)	(0.524)	(0.339)	(0.910)	(0.175)	(0.021)	(0.146)	(0.242)	(0.085)
H9	Major Shareholders (3%) Ratio	-0.027	-0.009	-0.021	-0.162	0.097	-0.090	-0.100	-0.045	0.737**
		(0.389)	(0.776)	(0.275)	(0.769)	(0.723)	(0.599)	(0.642)	(0.914)	(0.030)
H10	External Auditor Independence Ratio	-0.032	-0.0690*	-0.008	-0.128	-0.094	0.066	0.001	0.325	0.343
		(0.132)	(0.100)	(0.732)	(0.482)	(0.724)	(0.502)	(0.995)	(0.540)	(0.500)
	Firm Size (Assets LN)	-0.007	-0.007	-0.001	-0.139	0.508	0.346***	0.048	-0.062	-0.007
		(0.248)	(0.387)	(0.917)	(0.468)	(0.156)	(0.003)	(0.257)	(0.588)	(0.941)
	Debt to Equity Ratio	-0.001	0.000	-0.001	0.020	-0.007	-0.0102*	-0.0121**	-0.011	-0.009
		(0.236)	(0.846)	(0.161)	(0.108)	(0.551)	(0.081)	(0.014)	(0.391)	(0.313)
	Country FE	-	-	-	YES	YES	YES	YES	YES	YES
	Year FE	-	-	-	YES	YES	YES	-	-	-
	R-squared (within)	0.2982	0.1645	0.0462	0.4792	0.5584	0.5722	0.0724	0.0560	0.1308
	R-squared (between)	0.4590	0.3108	0.3459	0.0535	0.0260	0.0019	0.6497	0.5836	0.7037
	R-squared (overall)	0.4554	0.2759	0.2634	0.0611	0.0021	0.0098	0.5317	0.4596	0.4295

pval in parentheses
****** p<0.01, ** p<0.05, * p<0.1***

Where B: Before, D: During, A: After

It is clear from *Table 2-20* that board size positively affected performance before the crisis, and that auditor independence had a negative impact during the crisis. It is obvious also that after the crisis, the ratio of independent non-executives as well as the managerial ownership ratio helped to improve performance, while major shareholders had a negative impact on firm performance, measured by the adjusted combined ratio which reduced by 0.7% (*Table 2-20*). According to *Table 2-21*, the ratio of independent non-executives grew from 35% before, and 37% during, to 40.50% after the crisis. On the other hand, both board non-duality and the bonus ratios positively affected firm performance during and after the crisis, while tenure length of independent non-executives reduced performance (*Table 2-20*). This increase in bonus can be explained by the rise in the average remuneration during the crisis, from £195K to £244K, and more after, reaching £285K, although the bonus ratio only increased by 1% during the crisis and 2% afterwards (*Table 2-21*). In other words, it can be argued that a new policy was adapted after the crisis to reward directors instantly with cash benefits, rather than shares and options. However, *Table 2-20* shows that the average number of outside directorships had negative effect on firm performance during the crisis, but that it had become positive after the crisis.

Table 2-21: Descriptive Statistics for the Global Financial Crisis (2007-09)

VARIABLES	Before			During			After		
variable	Mean	Median	Max	Mean	Median	Max	Mean	Median	Max
ROA	**3.42%**	**1.95%**	**33.20%**	**2.28%**	**1.21%**	**24.20%**	**2.40%**	**1.04%**	**31.76%**
ROE	**18.64%**	**17.85%**	**86.43%**	**9.65%**	**9.99%**	**81.19%**	**12.94%**	**11.76%**	**83.04%**
COMBND	142.15%	100.27%	1349.79 %	160.29%	104.10%	1441.79 %	165.49%	105.45%	1496.88 %
ADJCOMBND	**76.92%**	**79.31%**	**179.86%**	**97.37%**	**87.45%**	**536.31%**	**89.26%**	**88.64%**	**741.79%**
FSIZE_LN_S	**6.53**	**6.40**	**10.97**	**6.62**	**6.49**	**10.95**	**6.83**	**6.67**	**10.96**
FSIZE_LN_A	14.66	14.36	19.49	14.67	14.38	19.69	14.97	14.78	19.73
LVRG_DE	**11.57**	**4.85**	**117.84**	**11.11**	**4.27**	**109.36**	**11.91**	**4.16**	**101.59**
LVRG_DA	80.24%	83.50%	100.00%	76.29%	81.42%	100.00%	77.22%	81.19%	100.00%
SLVNCY_EA	21.32%	17.00%	100.00%	24.45%	18.98%	99.30%	23.48%	19.39%	99.10%
BRDSIZE	**8.86**	**8.00**	**17.00**	**8.66**	**8.00**	**22.00**	**8.63**	**9.00**	**17.00**
INED	**35.18%**	**36.36%**	**77.78%**	**37.73%**	**40.00%**	**83.33%**	**40.48%**	**42.86%**	**90.00%**
BRDNONDLTY	**80.00%**	**100.00%**	**100.00%**	**84.77%**	**100.00%**	**100.00%**	**87.69%**	**100.00%**	**100.00%**
EDTNR	**4.16**	**3.86**	**13.57**	**4.10**	**3.54**	**11.53**	**4.41**	**3.84**	**15.33**
INEDTNR	**3.53**	**2.97**	**13.82**	**3.64**	**3.31**	**14.82**	**3.84**	**3.51**	**16.57**
BUSYNESSBRD	54.44%	50.00%	100.00%	64.64%	66.67%	100.00%	77.00%	80.00%	100.00%
BUSYBRDOUT~R	3.37	3.00	11.43	8.02	3.71	232.75	8.94	5.17	232.75
BUSYEDOUTDIR	3.86	2.90	14.60	5.19	4.00	17.33	6.93	5.00	26.00
BUSYINEDOU~R	**3.44**	**2.60**	**22.00**	**4.34**	**3.07**	**26.00**	**5.25**	**4.50**	**26.00**
BRDREMAV	194.45	135.57	738.07	244.33	187.32	972.47	285.80	210.79	1,271.24
EDREM	82.29%	84.27%	100.00%	78.48%	81.98%	96.97%	77.38%	81.49%	94.85%
HPAIDDIR	35.33%	31.82%	83.10%	35.67%	30.61%	92.28%	39.51%	35.46%	93.83%

VARIABLES	Before			During			After		
EDBONUS2ED	**34.27%**	**38.44%**	**75.84%**	**35.02%**	**34.61%**	**81.15%**	**37.16%**	**38.71%**	**100.00%**
EDBONUS2REM	29.39%	31.33%	72.20%	28.78%	28.80%	74.44%	29.34%	29.92%	75.02%
BRDOWN	4.42%	0.00%	83.94%	2.19%	0.00%	54.29%	1.47%	0.00%	54.19%
EDOWN	**2.25%**	**0.00%**	**71.80%**	**0.78%**	**0.00%**	**19.24%**	**0.87%**	**0.00%**	**26.53%**
MAINSHRHLDR	72.75%	100.00%	100.00%	70.61%	100.00%	100.00%	69.59%	100.00%	100.00%
BLKSHRHLDRS	74.23%	100.00%	100.00%	73.26%	100.00%	100.00%	72.95%	100.00%	100.00%
MJRSHRHLDRS	**76.15%**	**100.00%**	**100.00%**	**75.41%**	**100.00%**	**100.00%**	**75.06%**	**100.00%**	**100.00%**
AUDITORBIG4	93.41%	100.00%	100.00%	92.39%	100.00%	100.00%	92.91%	100.00%	100.00%
AUDITORIND	**72.90%**	**74.25%**	**100.00%**	**73.29%**	**75.00%**	**100.00%**	**73.21%**	**74.12%**	**100.00%**

Where ROA: Return on Assets, ROE: Return on Equity, COMBND: Combined Ratio, ADJCOMBND: Adjusted Combined Ratio, FSIZE_LN_S: Firm Size=Ln(Staff), FSIZE_LN_A: Firm Size=Ln(Total Assets), LVRG_DE: Financial Leverage (Total Debt/Total Equity) , LVRG_DA: Financial Leverage (Total Debt/Total Assets), SLVNCY_EA: Solvency Ratio (Equity/Assets), BRDSIZE: Board Size, INED: Ratio of Independent Non-Executive Directors, BRDNONDLTY: Board Non-Duality, EDTNR: Average Tenure Length for Executives, INEDTNR: Average Tenure Length for Non-Executives, BUSYNESSBRD: Busy Directors Ratio, BUSYBRDOUTDIR: Board Out directorship Ratio, BUSYEDOUTDIR: Executives Out directorship Ratio, BUSYINEDOUDIR: Independent Non-Executives Out directorship Ratio, BRDREMAV: Average Board Remuneration, EDREM: Executives Remuneration Ratio, HPAIDDIR: Highest Paid Director Ratio, EDBONUS2ED: ED Bonus to ED Remuneration, EDBONUS2REM: ED Bonus to Board Remuneration, BRDOWN: Board Ownership Ratio, EDOWN: Executives Ownership Ratio, MAINSHRHLDR: Main Shareholder Ratio, BLKSHRHLDRS: Block Shareholders Ratio (5%), MJRSHRHLDRS: Major Shareholders Ratio (3%), AUDITORBIG4: Auditor from Big 4 Audit Firms, AUDITORIND: Auditor Independence Ratio.

- ***Regression Results for Soft & Hard Insurance Market***

Table 2-22 shows that corporate governance arrangements had higher impact on firm performance during soft phase of the underwriting insurance cycles, rather than hard phase. However, as far as the researcher knows, there are no prior studies yet on how the board of directors would respond to the soft and hard phases of underwriting cycles. In a soft market, where insurers suffer from lower premiums and increased competition although more policies can be underwritten, many independent non-executives who have additional outside directorships would help insurance companies to improve their adjusted combined ratio, as long as those non-executive directors do not have tenure long enough to be considered non-independent (*Table 2-22*). On the other hand, in a hard market, where fewer policies can be underwritten with more restrictions, but with less competition, according to *Table 2-22*, insurers would benefit from an expanding board size as well as executives staying longer on the board. This was demonstrated by the slight improvements in their ROA by 0.06%, ROE by 0.016% and combined ratio by 0.02%. Indeed, it is clear that boards in the hard market were slightly larger compared with their size in the soft market (*Table 2-23*), while there was no difference in the tenure length of executives, which might explain its effect in the hard market only. However, it can be seen from *Table 2-23* that the managerial ownership ratio for executives in the hard market was more than double the ratio in the soft market (2.37%), which meant that insurers did reward executive directors with shares to align their interests with shareholders'.

Table 2-22: Summary of Regression Results for Soft and Hard Insurance Market

	VARIABLES	Model 01 RE ROA		Model 02 FE ROE		Model 03 FE COMBND	
		S	H	S	H	S	H
H1	Board Size LN	0.003	0.0579*	-0.053	-0.013	-0.182	0.034
		(0.883)	(0.050)	(0.682)	(0.970)	(0.640)	(0.884)
H2	Independent NED Ratio	-0.062	-0.034	-0.253	-0.535	-1.240*	-0.303
		(0.170)	(0.516)	(0.314)	(0.322)	(0.094)	(0.461)
H3	Board Non-Duality	0.008	-	0.088	-	0.280	0.487
		(0.745)		(0.524)		(0.539)	(0.414)
H4	ED Tenure	0.000	0.002	0.003	0.0166*	-0.016	-0.0217*
		(0.800)	(0.153)	(0.785)	(0.096)	(0.569)	(0.068)
H5	INED Tenure	-0.00428**	-0.003	-0.0412***	-0.050	-0.028	-0.036
		(0.037)	(0.401)	(0.000)	(0.317)	(0.415)	(0.139)
H6	INED Outside Directorships Average	0.000	-0.001	-0.019	-0.013	-0.0920**	-0.034
		(0.851)	(0.836)	(0.245)	(0.889)	(0.029)	(0.319)
H7	ED Bonus to ED Compensation Ratio	0.020	-0.038	0.318**	-0.113	-0.748**	-0.045
		(0.334)	(0.119)	(0.010)	(0.664)	(0.043)	(0.829)
H8	ED Ownership Ratio	0.025	0.032	1.186*	-0.617	-1.048	0.856
		(0.686)	(0.730)	(0.075)	(0.910)	(0.223)	(0.146)
H9	Major Shareholders (3%) Ratio	-0.003	-0.027	0.078	-0.162	0.357	-0.100
		(0.881)	(0.389)	(0.506)	(0.769)	(0.184)	(0.642)
H10	External Auditor Independence Ratio	-0.0358*	-0.032	-0.048	-0.128	0.346	0.001
		(0.069)	(0.132)	(0.642)	(0.482)	(0.321)	(0.995)

VARIABLES	Model 01 RE ROA		Model 02 FE ROE		Model 03 FE COMBND	
	S	H	S	H	S	H
Firm Size (Assets LN)	0.000	-0.007	0.132	-0.139	-0.043	0.048
	(0.937)	(0.248)	(0.114)	(0.468)	(0.559)	(0.257)
Debt to Equity Ratio	-0.001	-0.001	-0.005	0.020	-0.005	-0.0121**
	(0.161)	(0.236)	(0.308)	(0.108)	(0.559)	(0.014)
Country FE	**-**	**-**	**YES**	**YES**	**YES**	**YES**
Year FE	**-**	**-**	**YES**	**YES**	**-**	**-**
R-squared (within)	**0.1318**	**0.2982**	**0.3997**	**0.4792**	**0.0201**	**0.0724**
R-squared (between)	0.1588	0.4590	0.0047	0.0535	0.6290	0.6497
R-squared (overall)	0.1125	0.4554	0.0187	0.0611	0.3598	0.5317

pval in parentheses
****** p<0.01, ** p<0.05, * p<0.1***

Where S: Soft, H: Hard

Table 2-23: Descriptive Statistics for the Insurance Cycle (Soft, Hard)

VARIABLES	Soft			Hard		
variable	Mean	Median	Max	Mean	Median	Max
ROA	**2.65%**	**1.40%**	**33.20%**	**2.64%**	**1.33%**	**26.17%**
ROE	**13.11%**	**12.24%**	**86.43%**	**15.29%**	**14.17%**	**82.97%**
COMBND	161.17%	104.16%	1496.88%	140.52%	100.28%	1349.79%
ADJCOMBND	**89.35%**	**86.29%**	**741.79%**	**83.16%**	**85.01%**	**251.26%**
FSIZE_LN_S	**6.67**	**6.54**	**10.97**	**6.71**	**6.62**	**10.95**
FSIZE_LN_A	14.78	14.53	19.73	14.83	14.51	19.71
LVRG_DE	**11.50**	**4.39**	**114.75**	**11.86**	**4.65**	**117.84**
LVRG_DA	77.56%	82.21%	100.00%	78.70%	82.85%	100.00%
SLVNCY_EA	23.36%	18.47%	100.00%	22.30%	17.54%	100.00%
BRDSIZE	**8.67**	**8.00**	**22.00**	**8.82**	**9.00**	**17.00**
INED	**37.96%**	**40.00%**	**90.00%**	**39.01%**	**40.00%**	**77.78%**
BRDNONDLTY	**85.03%**	**100.00%**	**100.00%**	**83.06%**	**100.00%**	**100.00%**
EDTNR	**4.24**	**3.72**	**14.33**	**4.27**	**3.70**	**15.33**
INEDTNR	**3.74**	**3.39**	**15.57**	**3.48**	**3.03**	**16.57**
BUSYNESSBRD	66.36%	66.67%	100.00%	69.31%	75.00%	100.00%
BUSYBRDOUT~R	7.26	3.82	232.75	6.45	4.39	192.40
BUSYEDOUTDIR	5.42	4.00	24.00	6.03	4.37	26.00
BUSYINEDOU~R	**4.44**	**3.33**	**26.00**	**4.64**	**4.00**	**23.00**
BRDREMAV	251.02	192.36	1,154.00	242.23	176.15	1,271.24
EDREM	78.57%	82.27%	96.97%	80.42%	81.96%	100.00%
HPAIDDIR	36.91%	32.42%	93.83%	38.64%	35.11%	93.10%
EDBONUS2ED	**36.06%**	**37.50%**	**100.00%**	**34.81%**	**36.23%**	**100.00%**
EDBONUS2REM	29.37%	30.49%	75.02%	28.38%	29.05%	73.45%
BRDOWN	2.51%	0.00%	83.94%	3.14%	5.91E-06	71.80%
EDOWN	**1.02%**	**0.00%**	**42.16%**	**2.37%**	**5.71E-06**	**71.80%**
MAINSHRHLDR	70.96%	100.00%	100.00%	70.05%	100.00%	100.00%
BLKSHRHLDRS	73.45%	100.00%	100.00%	73.22%	100.00%	100.00%
MJRSHRHLDRS	**75.56%**	**100.00%**	**100.00%**	**75.10%**	**100.00%**	**100.00%**
AUDITORBIG4	92.73%	100.00%	100.00%	93.55%	100.00%	100.00%
AUDITORIND	**73.00%**	**74.25%**	**100.00%**	**73.79%**	**74.32%**	**100.00%**

Where ROA: Return on Assets, ROE: Return on Equity, COMBND: Combined Ratio, ADJCOMBND: Adjusted Combined Ratio, FSIZE_LN_S: Firm Size=Ln(Staff), FSIZE_LN_A: Firm Size=Ln(Total Assets), LVRG_DE: Financial Leverage (Total Debt/Total Equity) , LVRG_DA: Financial Leverage (Total Debt/Total Assets), SLVNCY_EA: Solvency Ratio (Equity/Assets), BRDSIZE: Board Size, INED: Ratio of Independent Non-Executive Directors, BRDNONDLTY: Board Non-Duality, EDTNR: Average Tenure Length for Executives, INEDTNR: Average Tenure Length for Non-Executives, BUSYNESSBRD: Busy Directors Ratio, BUSYBRDOUTDIR: Board Out directorship Ratio, BUSYEDOUTDIR: Executives Out directorship Ratio, BUSYINEDOUDIR: Independent Non-Executives Out directorship Ratio, BRDREMAV: Average Board Remuneration, EDREM: Executives Remuneration Ratio, HPAIDDIR: Highest Paid Director Ratio, EDBONUS2ED: ED Bonus to ED Remuneration, EDBONUS2REM: ED Bonus to Board Remuneration, BRDOWN: Board Ownership Ratio, EDOWN: Executives Ownership Ratio, MAINSHRHLDR: Main Shareholder Ratio, BLKSHRHLDRS: Block Shareholders Ratio (5%), MJRSHRHLDRS: Major Shareholders Ratio (3%), AUDITORBIG4: Auditor from Big 4 Audit Firms, AUDITORIND: Auditor Independence Ratio.

2.5 Conclusion

This section presents the research findings of the three regression models, highlights the research contributions, underlines the limitations and, finally, offers recommendations for further research.

2.5.1 Research Findings

The aim of this study was to examine the impact of corporate governance on firm performance in the UK insurance industry during the period 2004-2013, and to see if there are any insight by insurance line, quoting type, underwriting cycle and turbulent periods. The panel data set used in this study was hand-collected mainly from the annual reports of 67 UK insurance firms, consisting of both listed and non-listed companies and, thus, only accounting-based measures were used as proxies for firm performance. Therefore, the return on assets (ROA) and the return on equity (ROE) were chosen as the main performance measures in addition to the adjusted combined ratio as an insurance-related variable to measure operating performance. With regard to corporate governance variables, ten hypotheses were derived from the following arrangements; board size, proportion of independent non-executives, board non-duality, executives' tenure, independent non-executives' tenure, average outside directorships for independent non-executives, executives' bonus ratio, executives' ownership ratio, major shareholders ratio, and auditor independence ratio. Finally, prior to multiple regression analysis, various robustness checks were run, as well as other specification tests, which are required to select the best regression model; hence the choice of random effects, fixed effects with time dummies, and fixed effects models for the three dependent variables: ROA, ROE and adjusted combined ratio respectively. The main findings of those three regression models have been summarised followed by the regression results for the four sub-samples: firstly, Life, non-life and composite insurance; secondly, listed and non-listed companies; thirdly, before, during and after financial crisis (2007-09) and, finally, soft or hard insurance markets.

I. Main Research Findings

Firstly, board size showed no impact on firm performance, as well as the proportion of independent non-executive directors (INED) and board non-duality. On the other hand, as expected, the tenure length for executives was found to have a positive relationship with firm performance, while the tenure length for independent non-executives negatively affected firm performance. However, no relationship was found between the average number of outside directorships for independent non-executive directors and firm performance. Moreover, the findings related to board remuneration showed a positive significant impact of the bonus ratio

for executives on firm performance. Likewise, the ownership ratio for executives had a positive relationship with firm performance, while major shareholders had a non-significant effect on firm performance, similar to the auditor independence ratio, which was also found to have no impact on firm performance.

II. Research Findings for sub-samples

Regarding the type of insurance, most corporate governance arrangements had a clear impact on firm performance in non-life insurance companies, while only NED tenure length and NED outside directorships had significant effects on firm performance in life and composite companies. The auditor independence ratio affected only non-life and composite companies. However, the bonus ratio affected non-life insurance negatively, while the ownership ratio had a positive effect, by which the earnings volatility in non-life companies might be the reason leading those companies to reward their executives with shares rather than cash payments.

Secondly, being listed in a stock market would make insurance firms more sensitive to the changes in corporate governance arrangements than non-listed companies. However, tenure length and the average number of outside directorships for independent non-executives, major shareholders and independent auditor were the only arrangements that affected non-listed companies, albeit negatively. On the other hand, as expected, only board size, executives' bonus and ownership had positive impacts on firm performance in listed companies.

Thirdly, during the global financial crisis of 2007-09, the firms with separate chairman and CEO, longer tenure length for executives who were paid extra bonuses and other performance-related benefits in cash rather than in shares and, finally, shorter tenure length for independent non-executives with less outside directorships, experienced improved performance compared to other insurance firms. After the crisis, appointing extra independent non-executives, who had more outside directorships, as well as the increase in ownership ratio for executives in parallel with less ownership for major shareholders, helped insurance firms to recover and enhance their performance.

Finally, in the soft market, additional independent non-executives with shorter tenure length and more outside directorships, extra bonuses and other performance-related benefits paid to executives, and more non-audit services provided by auditors, helped insurance firms to improve performance, despite the lower premiums and increased competition. On the other hand, only increasing board size, by adding more executives, and extending tenure length of executives, helped insurers to cope with fewer policies and more restrictions on underwriting in the hard market.

2.5.2 Research Contributions & Policy Implications

This study complements other studies and contributes to the literature by examining the impact of various corporate governance arrangements and practices on three proxies for firm performance over a longer period of time stretching between 2004 and 2013. The first contribution is the creation of a manually collected dataset for insurance companies in the UK, while the core contribution of this study is the inclusion of both listed and non-listed insurance firms that sell life, non-life or both insurance products in the UK. Moreover, a new insurance-related variable, an adjusted combined ratio, has been used to measure firm performance alongside two other accounting-based performance measures, namely, the return on assets (ROA) and the return on equity (ROE). Another contribution is the findings for sub-samples, which show the varied impact of corporate governance arrangements by insurance line, quoting type, the Financial Crisis of 2007-09 (before, during and after), and finally, what stage the underwriting insurance cycle is in (soft or hard).

Regarding policy implications, investors should be aware of the specific corporate governance arrangements that have higher effect on the performance of the UK insurance firms in which they are considering to invest in. Regulators and policy-makers, in turn, should draw on these results to revise the recommendations on the best practice of corporate governance that prove to be ineffective in affecting firm performance. A special attention should be drawn to those arrangements that have different or unexpected effects among listed or non-listed firms, life or non-life insurers, soft or hard insurance market, and during the turbulent periods.

2.5.3 Research Limitations

Despite the importance of the research findings, this study suffered from several limitations. Firstly, this study did not examine all corporate governance arrangements available in the UK corporate governance code, as data for such variables was not available for all companies, from either annual reports, FAME, or other online sources. For example, details of directors' biographical information, board meetings, board experience and board sub-committees were available only for listed companies and large non-listed companies, as the disclosure of such numbers is not compulsory for non-listed companies. Secondly, since the sample included both listed and non-listed companies, in which no market-based measures, such as Tobin's Q, can be estimated for non-listed companies, this study has investigated the impact of corporate governance on firm performance from an accounting-based perspective only. Thirdly, as previously stated, it was assumed that corporate governance affected performance in insurance companies, although the results should be interpreted as a partial correlation, not a causal relationship, because in some cases firm performance might also have had an impact on some corporate governance arrangements, such as the bonus ratio and managerial ownership.

Finally, it could be argued that the financial crisis 2007-09 has ongoing effects past 2009 in addition to the possible effects of the Eurozone crisis 2010-12, as well as the ongoing effects of the regular changes to the UK corporate governance code during the study period 2004-2013, with further anticipated, as per April 2016. Therefore, there is the possibility that such changes and extended effects have controlled the way that corporate governance affected performance, rather than assuming pure influence over the years 2004-2013.

2.5.4 Further Research

Regarding corporate governance arrangements, this thesis calls for further investigation into the impact of specific activities that board members undertake within board committees, their experience in insurance, and their commitment to attending board and committees meetings. It would also be of significance to measure the firm efficiency score based on a combination of factors affecting firm performance, rather than using individual performance measures, which might not reflect the whole picture of how insurance firms operate. Moreover, the interacting relationship between conflicting arrangements, such as the negative impact of tenure and the positive impact of experience, should also be considered (see Yoo and Jung, 2014). Finally, this study has presumed that corporate governance affects firm performance, although reverse causality may occur in some cases, e.g. when successful firms reward directors with extra shares. Thus, further research could explore the direction of causation by using lagged independent variables in order to see, for example, if there is any relationship between past performance and corporate governance (see Eisenberg, Sundgren and Wells, 1998).

Chapter 3

The Development of a Corporate Governance Index for UK Insurance Firms, A Necessary Panacea?

Chapter 3: The Development of a Corporate Governance Index for UK Insurance Firms, a Necessary Panacea?

Abstract

The objective of this study is to assess whether the newly built UK Corporate Governance Index (UKCGI), which has been developed by the researcher, indicates any association between governance structure and firm performance in the UK life and non-life insurance companies, both listed and non-listed, during the period 2004-2013. The sample started in 2004 after the Financial Reporting Council (FRC) had released the UK corporate governance code in 2003, and ended in 2013, since this was the most recent year for which data was available at the time of data collection. To the best of the researcher's knowledge, this study has been the first study which has investigated the mediating role of agency costs on the relationship between corporate governance and firm performance of both listed and non-listed insurance companies in the UK. A mediation analysis was run between the corporate governance index, agency costs and firm performance in order to explore any relationship between this index or any of its five sub-indices and firm performance, and whether agency costs mediated this association. The main findings indicated a significant association between the new corporate governance index (UKCGI) and firm performance, and that the governance-performance relationship is fully mediated by agency costs, suggesting that corporate governance does help to reduce agency costs, which in turn leads to improved firm performance.

Keywords: UK Corporate Governance Index (UKCGI), UK Corporate Governance Code, Agency Costs, Firm Performance, Mediation Analysis, Insurance, United Kingdom.

3.1 Introduction

The development of corporate governance was hampered by major corporate collapses and scandals in the late 1980s and early 1990s, leading to the release of corporate governance codes worldwide, which emphasise a set of principles and recommendations to improve corporate governance practices (Diacon and O'sullivan, 1995; Edwards and Clough, 2005; Hussainey and Al-Najjar, 2012). In the UK, corporate failures led to the establishment of the Cadbury committee in 1991, which issued the Cadbury report in 1992, including a set of recommendations for the best practice of UK corporate governance (Cadbury, 1992; FRC, 2012b). After several reports, the Financial Reporting Council issued the first UK corporate governance code in 1998, known as The Combined Code, and became responsible for updating the code at regular intervals, of which the latest version was issued in April 2016 (FRC, 2016). Later on, this code became an international corporate governance benchmark, thanks to its unique approach 'Comply or Explain', which means compliance with the UK corporate governance code is optional for all companies as long as an explanation for non-compliance is presented in their annual reports (Arcot, Bruno and Faure-Grimaud, 2009; FRC, 2014). The flexibility of the 'Comply or Explain' approach has encouraged companies to adopt the spirit of the Code, rather than the letter, leading to better governance (Arcot, Bruno and Faure-Grimaud, 2009). However, some companies follow the letter of the code requirements rather than seriously commit to corporate governance, in that they provide poor explanation of any non-compliance with the code, and stick with it until they are compliant (FRC, 2007; Arcot, Bruno and Faure-Grimaud, 2009). Indeed, (Chen *et al.*, 2007) argued, that although all companies should apply those principles, not all of them have achieved good corporate governance.

Corporate governance has become a significant criterion for investors to consider when making investment decisions, since well-governed firms with an independent board of directors help to reduce agency costs and improve operating performance (Core, Holthausen and Larcker, 1999; Barrett, Todd and Schlaudecker, 2004; Kao, Chiou and Chen, 2004; Epps and Cereola, 2008). Prior research has found a correlation between certain corporate governance arrangements and firm performance (Chen *et al.*, 2007), while many commercial organisations have offered corporate governance ratings that rank the quality of other firms' corporate governance practice, such as the Institutional Shareholder Services (ISS), Governance Metric International (GMI), and The Corporate Library (TCL) (Epps and Cereola, 2008). On the other hand, researchers, such as (Gompers, Ishii and Metrick, 2003), (Klapper and Love, 2004), and (Brown and Caylor, 2006) have developed their own corporate governance indices, while eight stock exchanges around the world have launched corporate governance indices since 2001, namely, Brazil, China, Italy, Mexico, Peru, South Africa, South Korea, and Turkey. A corporate governance index for the UK insurance companies has yet to

be found, due to the shortcomings of other ratings (see Bhagat and Bolton, 2008; Daines, Gow and Larcker, 2010; Schnyder, 2012; Bozec and Bozec, 2012), which will be discussed later on in the following section. The index developed by the current research, therefore, is based on the best practices of the UK corporate governance codes as well as the principles of corporate governance for unlisted companies in the UK and, thus, compares the ratings of different companies over different years with firm performance in order to find any statistical evidence. If the association is confirmed, this suggests that this newly constructed index is more sensitive to operating performance than other popular ratings, and it also covers both listed and non-listed insurance companies.

In this regard, according to agency theory, corporate governance has been considered as a system that provides the key mechanisms needed to align the interests of managers and shareholders by monitoring and restricting managers' opportunistic behaviour, and improving shareholders' interests. As a result, agency conflicts between managers and shareholders would be resolved, which mitigates the agency costs associated with those conflicts and, thus, improves firm performance (Fama and Jensen, 1983; Shleifer and Vishny, 1986b; McKnight and Weir, 2009). However, to the best of the researcher's knowledge, only two previous studies have investigated the mediating effect of agency costs on the governance-performance relationship as indicated by agency theory (see Le and Buck, 2011; Huang, Wang and Wang, 2015), although both studies have used individual corporate governance arrangements, and focused on either listed companies (Le and Buck, 2011) or non-financial firms (Huang, Wang and Wang, 2015).

Therefore, the objective of this study is to assess whether our newly built UK Corporate Governance Index (UKCGI) indicates any association between governance structure and firm performance in the life and non-life UK insurance companies, both listed and non-listed, during the period 2004-2013. To the best of the researcher's knowledge, this study has also been the first study which has investigated the mediating role of agency costs on the relationship between corporate governance and firm performance of both listed and non-listed insurance companies in the UK. To sum up, this study will try to answer the following research questions:

1. ***How sensitive is firm performance to the corporate governance rankings of Insurance companies in the UK, produced using our new UK Corporate Governance Index (UKICGI)?***
2. ***Do agency costs mediate completely the relationship between corporate governance and firm performance?***

This chapter continues as follows. Section 2 presents the popular corporate governance indices provided by commercial agencies and other academic bodies, and analyses their shortcomings

regarding their relationship with firm performance. It also reviews the literature on the pairwise association between corporate governance, agency costs and firm performance, as well as the mediating role of agency costs on the governance-performance relationship. Section 3 defines the dataset, data sources, sampling process, and how variables were chosen and calculated. It also presents the research methodology and how the mediation analysis was carried out using panel data regression. Section 4 describes the variables used in this study, and carries out some robustness checks on the regression models used. Then, the regression results are presented and discussed. Finally, section 5 summarises the main findings and contributions, highlight the research limitations and suggest some possibilities for further research.

3.2 Literature Review

This section reviews firstly the corporate governance indices either provided by commercial agencies or self-constructed by other researchers and academics. Secondly, prior literature on the relationship between corporate governance and firm performance, as well as the mediation role of agency costs, are presented and discussed.

3.2.1 Toward Developing Corporate Governance Indices

Following the corporate scandals in the early nineties, financial authorities in many countries have established and released corporate governance codes for good practice, in order for companies to comply with their provisions in either of two ways, mandatory systems, such as the Sarbanes-Oxely Act in the US, or flexible systems, such as the UK corporate governance code (Arcot, Bruno and Faure-Grimaud, 2009). Recently, much interest has been drawn to corporate governance by researchers, investors, and policy-makers, reflecting a general consensus that good corporate governance leads to improved firm performance (Bozec and Bozec, 2012). Institutional investors, in particular, have become more interested in governance issues when making investment decisions (Barrett, Todd and Schlaudecker, 2004). Thereafter, investors urge firms to implement the best practices in corporate governance, such as the separation of the roles of Chair and CEO, having a majority of independent non-executive directors, keeping former CEOs off the board, linking CEO rewards to performance, the existence of audit and other sub-committees and, finally, adequate communication with investors (Edwards and Clough, 2005; Koehn and Ueng, 2005).

In order to investigate the impact of corporate governance arrangements on firm performance, prior research has used single or individual measures, such as board independence or CEO duality, to assess the quality of corporate governance (Schnyder, 2012). However, Aguilera *et al.* (2008), Ward, Brown and Rodriguez (2009) and Aguilera, Desender and Castro (2012) have claimed that different corporate governance measures may appear ineffective if examined separately, but may have a significant effect on performance when combined with other measures. Moreover, Schnyder (2012) argued that using such a simple measure for the complex nature of corporate governance might lead to omitting important interactions between corporate governance arrangements, even if a single variable may strengthen the predictive power of a model. Later on, Bozec and Bozec (2012) claimed that governance-performance relationship literature has gradually evolved from studies that used one or multiple governance arrangements to studies that employ holistic governance ratings or indices.

Those corporate governance indices have been developed either by rating agencies (e.g. Governance Metric International [GMI], Institutional Shareholder Service [ISS]), or researchers (e.g. Gompers, Ishii and Metrick, 2003; Klapper and Love, 2004; Black, Jang and Kim, 2006; Ananchotikul, 2008).

I. Rating Agencies' CG Indices

Following the investors' high demand for a global benchmark of good governance, a growing number of proxy-advisory and corporate governance rating firms have constructed multifactor indices for the quality of corporate governance arrangements for publicly listed firms, such as *The Corporate Library (TCL), Governance Metric International (GMI)*, *Credit Lyonnais Securities Asia (CLSA)*, and *Institutional Shareholder Service (ISS)* (Barrett, Todd and Schlaudecker, 2004; Epps and Cereola, 2008; Daines, Gow and Larcker, 2010; Schnyder, 2012; Bozec and Bozec, 2012).

Firstly, [1] ***The Corporate Library's Board Effectiveness Ratings (TCL)***, was founded in 1999, and reflects subjective judgement and expertise. The board analyst database includes information on over 2,100 US companies and 400 international companies. This index includes approximately 120 variables based on six categories, and provides letter scores 'grade' ranging from an A to an F. Governance topics assessed are (1) Board composition, (2) CEO compensation, (3) Shareholder Responsiveness, (4) Accounting, (5) Strategic Decision-making, (6) Litigation and Regulatory Problems, (7) Takeover Defences, and (8) Problem Directors (Barrett, Todd and Schlaudecker, 2004; Epps and Cereola, 2008; Daines, Gow and Larcker, 2010).

Secondly, [2] ***Governance Metrics International (GMI)***, was founded in 2000, and rates corporate governance for nearly 3,400 U.S. and international companies. This index includes 600 variables based on six categories, and provides scores on a range from 1.0 (lowest) to 10.0 (highest). The GMI approach includes a comprehensive review of the following six areas of governance: (1) Board accountability, (2) Financial disclosure and internal controls, (3) Shareholder rights, (4) Executive compensation, (5) Market for control and ownership base, and (6) Corporate behaviour and corporate social responsibility issues (Barrett, Todd and Schlaudecker, 2004; Epps and Cereola, 2008; Daines, Gow and Larcker, 2010).

Thirdly, [3] Khanna, Kogan and Palepu (2001) reported on the ***Credit Lyonnais Securities Asia (CLSA)*** Corporate Governance Index. The index was constructed using a 57-question survey, in which all questions were answered in the yes/no form, and the answer 'no' was also used where corporate governance information was not available, indicating poor governance, and then, was divided into seven sub-indices.

Finally, [4] the ***Institutional Shareholder Services' CGQ rating (ISS)*** was founded in 2002, based on data taken from public filings and company surveys. This index rates the corporate

governance of over 5,200 U.S. companies and 2,300 international companies, and provides ratings based on a percentage scale. It is calculated as a composite of 225 variables, based on 61 rating criteria across eight categories. These categories are (1) board structure and composition, (2) audit issues, (3) Charter and Bylaw provisions, (4) Laws of the State of Incorporation, (5) Executive and Director Compensation, (6) Qualitative Factors, (7) Director and Officer Stock Ownership, and (8) Director Education (Barrett, Todd and Schlaudecker, 2004; Epps and Cereola, 2008; Daines, Gow and Larcker, 2010).

Those governance ratings depend on large and rich corporate governance databases from multiple data sources, and their complicated algorithms change every year to consider market trends (Daines, Gow and Larcker, 2010; Hussainey and Al-Najjar, 2012), and have been widely used in prior governance studies, suggesting a positive relationship between those ratings and firm performance (Hussainey and Al-Najjar, 2012). However, such indices are based on a large number of provisions that are not equally weighted, and usually calculated for the largest public companies and, thus, it is argued that the results can only be generalised to the large cap companies (Lenssen *et al.*, 2005; Bozec and Bozec, 2012). Moreover, some companies might be able to raise their corporate governance ratings from rating agencies by a few changes in corporate governance practices, which are not related to performance improvements, and thus, investors should not rely too heavily upon those commercial indices (Koehn and Ueng, 2005; Epps and Cereola, 2008). It is then important for investors to remember that a 'good governance rating' does not necessarily indicate 'good firm performance' (Epps and Cereola, 2008).

II. Researchers' CG Indices

On the other hand, researchers have either used these commercial ratings, or constructed their own indices, such as *Gompers, Ishii and Metrick (2003)*, *Klapper and Love (2004)*, *Black, Jang and Kim (2006)*, *Brown and Caylor (2006)*, and *Ananchotikul (2008)*. Firstly, [1] ***Gompers, Ishii and Metrick (2003)*** constructed an index of 28 provisions in the USA, by adding one point for every provision that increase managers' power and, thus, restricts shareholder rights. Sub-indices were also created. Secondly, [2] ***Klapper and Love (2004)*** developed a corporate governance index using the Credit Lyonnais Securities Asia (CLSA) questionnaire data as well as Worldscope data. The value of this index ranges between zero and 100, and consists of six components, rather than sub-indices, since they each have overlapping parts. Thirdly, [3] ***Black, Jang and Kim (2006b)*** constructed the Korean corporate governance index (KCGI) based on a survey of 39 governance elements, divided into five equally weighted sub-indexes (each 0~20), and carried out by the Korean Stock Exchange. However, unlike the other indices, if a firm does not report on a particular question, it is not considered as a part of the value in

this index. Fourthly, [4] ***Brown and Caylor (2006)*** created a corporate governance index 'Gov-Score', based on 51 governance factors in the USA. Later on, seven out of those variables, two external and five internal, were chosen to build a brief index 'Gov-7'. Finally, [5] ***Ananchotikul (2008)*** established an index ranging from 0 to 100, and used only publicly available information in Thailand. This index uses a weighted average of the sub-indices to create a composite corporate governance index, as follows: board structure (20%), conflict of interest (25%), board responsibility (20%), shareholder rights (10%), and finally, disclosure and transparency (25%).

However, researchers' indices are based on a small number of provisions that are equally weighted, and usually calculated in the same way over time using relatively limited data sources (Daines, Gow and Larcker, 2010; Lenssen *et al.*, 2005; Bozec and Bozec, 2012). Therefore, Daines, Gow and Larcker (2010) argued that index construction suffers from the lack of theoretical justification for what to include and what not, in addition to the lack of a theory to properly weight the different variables included in that index.

In summary, current corporate governance indices are backward-looking and, thus, unable to predict future performance better than single measures (Daines, Gow and Larcker, 2010). Links between different indices, estimated using sophisticated measures and methods, and firm performance so far are ambiguous and weakly correlated with each other, due to limitations of the methods used, measurement errors, and index construction (Bhagat and Bolton, 2008; Daines, Gow and Larcker, 2010; Schnyder, 2012; Bozec and Bozec, 2012). Moreover, there was no corporate governance index, either rating agencies' or researchers', that could be used for UK insurance companies in the study sample, since those indices focus on large and/or listed companies, while this sample consisted of both listed and non-listed firms. As a result, it was concluded that there was still room for a new, simple, comparable and reliable index, which could be used as a governance benchmarking tool by investors when making investment decisions, regulators and policy-makers, as well as the underlying firms themselves as a self-benchmark. This new index also combines the strengths of current corporate governance indices, whether rating agencies' or researchers', and overcomes their shortcomings and weaknesses.

On the other hand, the rationale for basing a new corporate governance index mainly on the UK Corporate Governance Code is twofold. First of all, the code articulates much of the corporate governance wisdom that has accumulated since the UK's corporate governance revolution began in 1992 with the publication of the Cadbury Report. Hence, the code is valuable as a distillation of corporate governance factors widely deemed to be vital in providing effective governance of listed companies, and as such, it provides the present

research with a suitable source from which key governance variables can be derived for the development of a new governance index. Secondly, it is nonetheless important to recognise that the Governance Code is corrigible. Although changes to it over the last few years have been relatively minor, it is likely that in future years and decades it will transform in ways as yet unforeseeable. To ensure that these changes succeed, the FRC, along with other bodies such as HM Treasury, which oversees periodic reviews of company law, may benefit from the development of methodologies, which permit the mettle of the corporate governance code to be tested. In distilling key governance variables from the code, it is hoped that the present research will yield an index, which can be tested by such bodies for its effects upon corporate performance. As part of such exercises, it should be possible to ascertain whether some governance factors not considered within the code, might usefully be included in order to demonstrably improve its effectiveness.

3.2.2 Corporate Governance, Agency Costs and Firm Performance in the UK Insurance Companies

This section reviews previous literature on the pairwise relationships between corporate governance, agency costs and firm performance in order to develop research hypotheses for further analysis in this chapter.

Regarding the theoretical framework, there are many different theories to explain corporate governance, such as Agency Theory, Resource Dependency Theory, Stakeholder Theory, Transaction Cost Theory, Stewardship Theory, as well as less popular theories that have been developed later, such as Class Hegemony Theory, Managerial Hegemony Theory, Institutional Theory, Political Theory and Network Governance Theory (see Mallin, 2012). However, the agency approach has been the most popular theory among other theories, as it has offered the basis for governance standards, codes and principles developed by many financial authorities around the world (Yusoff and Alhaji, 2012), while other theories are intended as complements to agency theory, rather than substitutes (Daily, Dalton and Cannella, 2003, p.375). Therefore, the proposed hypotheses have been based on the agency theory only as the main theory for the purpose of this study.

Agency theory has been first introduced by Alchian and Demsetz (1972), and then developed by Jensen and Meckling (1976), and it consists on the separation of ownership and control. In this theory, principals, shareholders or owners of the company, hires the agents, executives and management team, to operate the company in the principals' best interests, and thus, protect the ownership rights of shareholders. However, this theory suggests also that managers can be self-interested, and they might make decisions against the principals'

interests (Clark, 2004; Davis, Schoorman and Donaldson, 1997; Jensen and Meckling, 1976; Ross, 1973; Padilla, 2002) (Abdullah and Valentine, 2009). Indeed, agency theory can be used to investigate the relationship between the ownership and management structure. However, in the case where there is a separation, this theory can be applied to align the objectives of the management team with those of the owners (Abdullah and Valentine, 2009). In this regard, corporate governance can be seen as a mechanism where a board of directors is a vital monitoring tool to minimize the principal-agent problems, which leads to reduce the agency costs, and maximise the firm's value (Deegan, 2004; Mallin, 2004). The deviation in the objectives of corporate principals and agents, Diacon and O'sullivan (1995) and Dharwadkar, George and Brandes (2000) argue, results from weak governance as well as the inability of minority shareholders to monitor and control managers' activities.

I. Corporate Governance and Firm Performance

Corporate governance, as defined by Sir Adrian Cadbury (Cadbury, 1992, p15), is "the system by which companies are directed and controlled". It has been traditionally associated with the agency problem due to the separation of ownership and control[31] (Jensen and Meckling, 1976), in which managers (the agents) are employed by shareholders (the principals) in order to run firms in the shareholders' interests (Mayer, 1997) (see also Diacon and O'sullivan, 1995; Dharwadkar, George and Brandes, 2000; Deegan, 2004; Mallin, 2004; Huang *et al.*, 2011). In this agency problem, the board of directors is considered to be the main mechanism that helps shareholders to supervise and monitor managers' performance in order to ensure that the interests of managers, shareholders and other stakeholders' are aligned and, thus, improved performance is achieved in the long-term (Cadbury, 1992; Diacon and O'sullivan, 1995; Mayer, 1997; FRC, 2014). Therefore, it has been argued that good corporate governance would help the firm to better management and sensible resources' allocation, leading to enhanced firm performance (Mobius, 2002). On the other hand, the main role of insurance firms, according to Njegomir and Tepavac (2014), is to mitigate risks and protect firms against the adverse effects of such risks, to avoid burden of loss and get financial security for their business.

Extensive empirical research has been conducted over the last three decades aiming to investigate the relationship between corporate governance and firm performance. Most prior studies have found that well-governed firms are generally associated with improved corporate

[31] Agency theory argues that the delegation of executive duties by principals to agents requires a set of guidelines and rules to either align the interests of owners and managers, or monitor the performance of mangers to ensure they use their delegated powers in the best interests of the firm owners (Huang et al., 2011). In this regard, corporate governance can be seen as a mechanism where a board of directors is a vital monitoring tool to minimize the principal-agent problems, which leads to reduce the agency costs, and maximise the firm's value (Deegan, 2004; Mallin, 2004). The deviation in the objectives of corporate principals and agents, (Diacon and O'sullivan, 1995; Dharwadkar, George and Brandes, 2000) argue, results from weak governance as well as the inability of minority shareholders to monitor and control managers' activities.

performance (see Diacon and O'sullivan, 1995; Mayer, 1997; Bhagat and Black, 1999; Core, Holthausen and Larcker, 1999; Vafeas, 1999; Weir and Laing, 1999; Weir and Laing, 2001; Lausten, 2002; Brown and Caylor, 2004; Klapper and Love, 2004; Leng and Mansor, 2005; Nelson, 2005; Haniffa and Hudaib, 2006; Thomsen, Pedersen and Kvist, 2006; Huang, Hsiao and Lai, 2007; Mashayekhi and Bazaz, 2008; Guest, 2009; Spellman and Watson, 2009; Ponnu and Karthigeyan, 2010; Sueyoshi, Goto and Omi, 2010; Le and Buck, 2011; Sami, Wang and Zhou, 2011; Guo and Kga, 2012; Najjar, 2012; Babu and P.Viswanatham, 2013; Dedu and Chitan, 2013; Al-Najjar, 2014; Andreou, Louca and Panayides, 2014; Gupta and Sharma, 2014; Njegomir and Tepavac, 2014; Peni, 2014; Yoo and Jung, 2014), while other studies have confirmed this relationship using CG Indices rather than individual CG arrangements (see Gompers, Ishii and Metrick, 2003; Brown and Caylor, 2006; Chen *et al.*, 2007; Epps and Cereola, 2008; Bhagat and Bolton, 2008; Bozec and Bozec, 2012; Hassan, 2012; Munisi and Randøy, 2013).

For example, Carter, Simkins and Simpson (2003) found a significant positive relationship between the presence of women or minorities on the board and the firm value of 638 US listed fortune firms. Yoo and Jung (2014) examined the roles of traditional governance mechanisms, such as controlling shareholders, government's influence and family's involvement in management, on the corporate performance of large non-financial firms in France (130 firms) between 1998 and 2007, and South Korea (192 firms) between 2002 and 2009. The results highlighted a positive effect, with the exception of state ownership, and implied that the continuation of traditional mechanisms could be partly attributable to their performance contribution. On the other hand, using CG ranking across 14 emerging markets, Klapper and Love (2004) found that better corporate governance was positively associated with operating performance, and that this relationship becomes stronger in countries with weaker legal systems. Bhagat and Bolton (2008) also found that corporate governance index, managerial ownership and CEO-Chair separation had a significant positive impact on operating performance in the US between 1990 and 2004. Munisi and Randøy (2013) constructed their own index in order to investigate to what extent listed companies across Sub-Saharan African countries had implemented good practice of corporate governance, and found a positive relationship between this index and accounting performance, but a negative association with market valuation.

In the UK context, Diacon and O'sullivan (1995) examined the impact of a variety of governance arrangements on the performance of all major UK life and non-life insurance companies, and found that their independent impact on performance was complex, highly nonlinear, and dependent on the nature of the business transacted. They claimed that no universal recipe for the best form of corporate governance could be found, even if only one industry was

investigated. Nevertheless, Short and Keasey (1999) also conducted a study in the UK, using a sample of 225 listed firms, excluding the financial, oil and gas sectors, privatized firms, broadcasting firms, and firms than did not confirm to the typical one vote one share rule. The results confirmed the general finding of the US literature of a non-liner relationship between managerial ownership and firm performance. With respect to the insurance industry, Huang, Hsiao and Lai (2007) investigated the effect of ownership structure and corporate governance on firm performance of the 24 firms representing the complete population of Taiwan life insurers from 1996 to 2003, and their results confirmed a positive but weak relationship with different proxies for firm performance. On the other hand, Huang *et al.* (2011) explored the relationship between a number of corporate governance arrangements and the firm performance of 28 listed US property-liability insurers from 2000 to 2007 and found a significant association between most corporate governance measures and firm performance.

Therefore, this study complements prior literature, which has investigated the impact of corporate governance on firm performance, whereby the majority have found a positive and significant relationship. However, this study has included both listed and non-listed insurance companies over the period 2004 to 2013 using our own constructed UK corporate governance index. Hereafter, the following hypothesis will be proposed:

H1: There is a Positive Association between Corporate Governance and Firm Performance.

II. Corporate Governance and Agency Costs

Corporate governance has gained increased focus since the 1930's due to the separation of ownership from control, and even more attention following the major corporate scandals during the 1980's in the UK (Diacon and O'sullivan, 1995; Babu and P.Viswanatham, 2013). This separation has come about as a result of the agency relationship, which is defined according to Jensen and Meckling (1976, p5), as "a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent". Thus, the agents (management teams) have more information about the prospects of the business compared to the principals (shareholders and debtholders and other parties), which called '*Information Asymmetry'*. Akeem *et al.* (2014) argued that agency problems occur when agents hide information in order to manage firms in their own interest. Therefore, the higher the information asymmetry, the greater will be the agency costs. In the UK and US, where diffuse ownership is the norm, the agency costs arise mainly from the conflicts of interest between dispersed shareholders (principals) and powerful management teams (agents), while in the rest of the world, where concentrated ownership is the standard, agency costs arise originally

from the conflicts between controlling shareholders and minority shareholders (Jensen and Meckling, 1976; La-Porta, Lopez-De-Silanes and Shleifer, 1999; Claessens, Djankov and Lang, 2000; Faccio and Lang, 2002; Gompers, Ishii and Metrick, 2009; Holderness, 2009). According to Jensen and Meckling (1976), agency costs include monitoring costs paid to limit the abnormal activities of the agent, bonding costs paid to make sure the agent will not harm the principal by certain actions, as well as any other costs which occur because it is impossible to totally remove the conflicts between the agents and the principals. In short, agency costs are the sum of monitoring expenditure by the principal, bonding expenditure by the agent, and the residual loss (Jensen and Meckling, 1976).

Therefore, it is essential to investigate whether corporate governance reduces the costs accompanying agency conflicts, taking into account the prior literature on the positive effects of corporate governance on firm performance. In this regard, the prior literature has cited a number of corporate governance arrangements, such as board characteristics and managerial ownership, that would help to restrict the opportunistic behaviour of managers and, hence, align their interests with shareholders' (see Ang, Cole and Lin, 2000; Singh and Davidson, 2003; Felming, Heaney and Mccosker, 2005; Davidson, Bouresli and Singh, 2006; Chen and Austin, 2007; Florackis, 2008; Firth, Fung and Rui, 2008; McKnight and Weir, 2009; Hewa-Wellalage and Locke, 2011). (Core, Holthausen and Larcker, 1999) suggested clearly that firms with greater agency problems perform worse. For example, most previous studies have investigated first the impact of managerial ownership and agency costs, and found a negative association between them. Other corporate governance arrangements, such as board characteristics, managerial compensation, (Florackis, 2008), block shareholders and smaller boards (Ang, Cole and Lin, 2000), and managerial ownership (Singh and Davidson, 2003) have been also found to reduce agency costs. Florackis and Ozkan (2004) also revealed a negative relationship between board size and agency costs, while Gul *et al.* (2012) found, in addition to ownership structure and smaller boards, that board independence and non-duality have resulted in lower agency costs. However, McKnight and Weir (2009) argued that board characteristics have had little or no effect on agency costs in the UK, while there were some corporate governance arrangements which might have associated costs that have increased agency costs, such as having a nomination committee. On the other hand, Henry (2010) claimed that no influence on agency costs has been found with the adoption of individual corporate governance arrangements, while compliance with an overall governance index has been found to considerably mitigate agency costs.

To sum up, prior studies have confirmed the assumptions of agency theory in terms of the positive role of corporate governance in reducing agency costs, indicating that firms could mitigate agency costs by a variety of corporate governance arrangements. Consistent with the

results of Henry (2010), showing a negative relationship of the overall governance index with agency costs, our developed corporate governance index in this study (UKCGI), and its sub-indices, was anticipated to have a negative association with agency costs and, thus, the following hypothesis was suggested:

H2: There is a Negative Relationship between Corporate Governance and Agency Costs.

III. Agency Costs and Firm Performance

Agency conflicts and the impact of their associated costs have been investigated in various contexts. For example, some studies have explored the relationship between agency costs and company's financial decisions, such as capital structure (see Lasfer, 1995; Leland, 1998; Myers, 2001; Berger and Di Patti, 2006),while others have focused on the association between agency costs and dividend policy (see Filbeck and Mullineaux, 1999; Utami and Inanga, 2011; Ghosh and Sun, 2013). However, a limited amount of research has investigated the impact of agency costs on firm performance. For instance, (Boardman, Shapiro and Vining, 1997) focused on the performance of the foreign subsidiaries of multi-national enterprises (MNE) and found that, consistent with agency theory, MNE subsidiaries were more efficient than domestic firms, partly because of lower agency costs due to concentrated ownership. Moreover, (Gompers, Ishii and Metrick, 2003) found that firms with stronger shareholder rights, which means lower agency costs, had higher firm value, higher profits, higher sales growth, lower capital expenditures, and made fewer corporate acquisitions. On the other hand, (Berger and Di Patti, 2006) investigated the relationship in the US banking industry, and their results confirmed that agency costs influence firm performance using profit efficiency as a performance proxy. Similarly, (Xiao and Zhao, 2009), and (Le and Buck, 2011) examined this association in Chinese companies, while (Wang, 2010) focused on a sample of Taiwanese companies, and the results also supported the agency theory, indicating that agency costs have a significant negative impact on firm performance. Therefore, the following hypothesis was proposed, based on the agency theory:

H3: There is a Negative Relationship between Agency Costs and Firm Performance.

IV. Agency Costs as a Mediator in the Relationship between Corporate Governance and Firm Performance

According to (Allen and Gale, 2000) corporate governance, is concerned with the best arrangements, based on agency theory, for effective corporate control to make managers (agents) act in the best interest of shareholders (principals) (quoted in Bonazzi and Islam, 2007). Therefore, effective corporate governance, through the board of directors as the main

CG monitoring mechanism, can help to mitigate agency costs, leading to improved firm performance and increased shareholders' wealth (Fama and Jensen, 1983; McColgan, 2001). However, as discussed previously in this chapter, prior empirical research has investigated only two of those three parties. In other words, most previous studies have focused on the direct association between corporate governance and agency costs (see Ang, Cole and Lin, 2000; Singh and Davidson, 2003; Chen and Austin, 2007; Henry, 2010), or between corporate governance and firm performance (see Short and Keasey, 1999; Gompers, Ishii and Metrick, 2003; Bhagat and Bolton, 2008; Black, De Carvalho and Gorga, 2012), or even between agency costs and firm performance (see Boardman, Shapiro and Vining, 1997; Berger and Di Patti, 2006; Xiao and Zhao, 2009; Wang, 2010).

To the best to the researcher's knowledge, there are only two studies which have investigated the mediating role of agency costs on the relationship between corporate governance and firm performance. The first study was done by (Le and Buck, 2011), who examined this mediating role of agency costs in a sample of 1,000+ Chinese listed companies during the period 2003-2005, revealing a positive association between state ownership and firm performance, with agency costs as a mediator. In the second study, (Huang, Wang and Wang, 2015) investigated the effectiveness of external corporate governance in mitigating agency costs and enhancing long-term operating performance, and the mediating role of agency costs in the relationship between governance structure and post-SEO operating performance in a sample of 247 non-financial US seasoned equity offerings (SEOs) during the period 2000-2007. The results of both studies have revealed a significant role of the agency costs in the causal relationship between corporate governance and firm performance. Therefore, consistent with those two studies, the following hypothesis was tested in the UK context, including both listed and non-listed insurance companies:

H4: Agency Costs Mediate the Positive Association between Corporate Governance and Firm Performance.

3.3 Data and Methodology

This section first discusses the research philosophy, approach and methods used to answer the research questions, and justifies the choice of panel data analysis, and the mediation analysis as well. It then describes the dataset and data sources, and finally, defines the variables used in this analysis.

3.3.1 Research Philosophy, Approach and Methods

Research philosophy is defined as a set of beliefs and views of the knowledge being examined in a research project, in which the philosophical assumptions justify how the research question will be answered (Flick, 2011; Saunders, Lewis and Thornhill, 2012; Bryman, 2012). The main research paradigms are *positivism*, *realism*, *interpretivism* and *pragmatism* (Saunders, Lewis and Thornhill, 2012). This study applied the positivism paradigm since its hypotheses, concerning the impact of corporate governance and agency costs on firm performance, and related theories could be empirically investigated using researchers' analysis tools rather than their values (Saunders, Lewis and Thornhill, 2012).

The choice of a specific philosophy helps to select the best-suited of two research approaches: deductive and inductive. The deductive approach starts from pre-existing theory to develop hypotheses, and to test those assumptions and, thus, it goes from general to the specific (Saunders, Lewis and Thornhill, 2012; Kothari, 2004; Silverman, 2013). In contrast, the inductive approach moves from the particular to general, as researchers start from observations, and then look for patterns in the data, which can help to generate new theories (Flick, 2011; Bryman and Bell, 2011). Therefore, this study implemented the deductive approach, as it was concerned with the need to investigate the casual relationships among variables in order to test hypotheses and, thus, generalise results rather than generating new theories (Saunders, Lewis and Thornhill, 2012).

Research methods have two main types, namely quantitative and qualitative. With quantitative methods, numeric data can be effectively collected from a large number of respondents, measured using various quantitative techniques, such as questionnaires and analysed using a variety of statistical analysis tools in order to test the established hypotheses (Goddard and Melville, 2004; May, 2011; Bryman, 2012). Qualitative methods, on the other hand, collect information using a descriptive and non-numerical approach, such as interviews, in order to examine the meaning of social phenomena, rather than the causal relationship between variables (Berg, 2004; Feilzer, 2010). Researchers have the choice to use either one or more quantitative methods, one or more qualitative methods, or even a mixture of both. The

quantitative data required for empirical analysis is categorised into three groups: cross-sectional data, time series data, and Longitudinal or panel data. In cross-sectional data, variables from several entities are collected at the same point of time, while in time series data, variables from one entity are observed over a period of time. In panel data, on the other hand, variables from several entities are gathered over a period of time (Gujarati, 2003; Goddard and Melville, 2004; Flick, 2011; Saunders, Lewis and Thornhill, 2012; Bryman, 2012; Greene, 2003; Huang, Hsiao and Lai, 2007)[32].

This study used quantitative methods to collect panel data in order to investigate the mediating role of agency costs on the association between corporate governance and firm performance of different insurance companies over a period of 10 years. Thereafter, the causal relationship between those three parties was examined using multiple regression analysis, as it was the most appropriate method of analysis when one dependent variable is assumed to be associated with two or more independent variables (Hair *et al.*, 2009) (see Diacon and O'sullivan, 1995; Core, Holthausen and Larcker, 1999; Bhagat and Bolton, 2008; Huang *et al.*, 2011).

3.3.2 Mediation Analysis

According to Baron and Kenny (1986, p1176), "a given variable may be said to function as a mediator to the extent that it accounts for the relation between the predictor and the criterion".

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[32] The basic regression model for panel data, (Greene, 2003), is written as:

$$\gamma_{it} = X'_{it}\beta + Z'_i\alpha + \varepsilon_{it}$$

Where:

- γ_{it} is the dependent variable.
- X'_{it} are the independent variables.
- β and α are coefficients.
- Z'_i is an unobserved entity specific effect.
- ε_{it} is the error term.
- $_i$ is index for entity
- $_t$ is index for time.

However, Greene (2003) argued that the individual effect Z'i contains a constant term and a set of individual of group specific variables. Those variables might be observed, such as gender and location, or unobserved, such as family specific characteristics, which are assumed to be constant over time (Greene, 2003). If Z'i is observed for all individuals, the original model turns into an ordinary least squares (OLS) model, or linear least squares model. Otherwise, panel data can be analysed using either fixed effects or random effects in order to capture the entity and time specific effects (Greene, 2003).

The primary difference between the fixed effects and random effects model is that the fixed effects model allows the intercepts of the regression to vary by entity, and does not require that individual entity effect to be independent of the regressors (Huang et al., 2007). Therefore, if Z'i is unobserved, but correlated with X'it, then the least squares estimator of β is biased and inconsistent due to omitted variables, and the fixed effects model is formulated as follows:

$$\gamma_{it} = X'_{it}\beta + \alpha_i + \varepsilon_{it}$$

Where:

- α_i is the unknown intercept for each entity.

The random effects model allows for differences among firms using the firm-specific error component εit, and does require the individual entity effect to be independent of the regressors (Huang et al., 2007) and, thus, the random effects model is expressed as follows:

$$\gamma_{it} = X'_{it}\beta + \alpha + u_i + \varepsilon_{it}$$

Where:

- u_i is a group specific random element.

In order to determine whether to apply the fixed effects or the random effects model, researchers often use the Hausman test (1978). Then, the Breusch-Pagan Lagrange Multiplier test (1979), or the F-Test, are required to decide between random effects or fixed effects models respectively, or an ordinary linear model (OLS).

In other words, mediation refers to a hypothesized series of causal relationships in which the independent variable affects a mediator variable, which, in turn, affects the dependent variable.

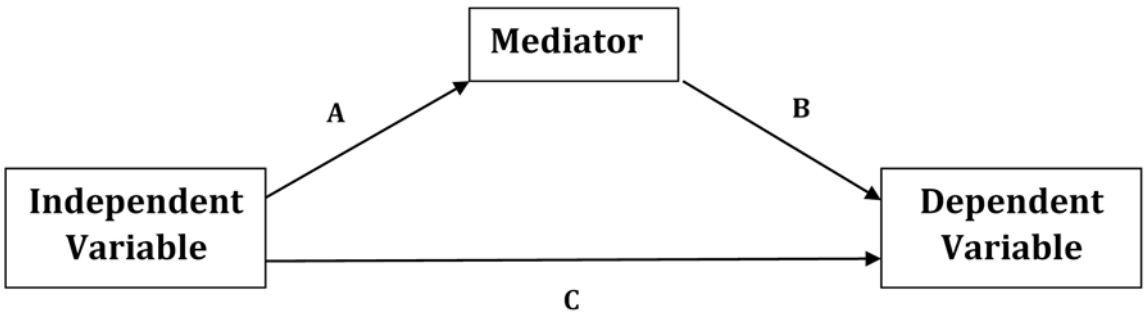

Figure 3-1: The Mediation Model

***Source**: Baron and Kenny (1986)*

In order to test the given variable for mediation, Baron and Kenny (1986) proposed that three regression equations (three-step process) be conducted (*Figure 3-1*): firstly, regress the dependent variable on the independent variable; secondly, regress the mediator on the independent variable; and thirdly, regress the dependent variable on both the independent variable and on the mediator. Therefore, Baron and Kenny (1986) suggested that mediation is established when the following conditions are met: firstly, there is a significant association between the independent variable and the dependent variable in the first regression; secondly, there is a significant association between the independent variable and the mediator in the second regression; and, thirdly, there is a significant association between the mediator and the dependent variable in the third regression. Finally, the effect of the independent variable on the dependent variable is reduced when adding the mediator in the third regression. Baron and Kenny (1986) argued that if the independent variable becomes insignificant in the presence of the mediator, the effects of the independent variable are completely mediated by the mediator "Perfect Mediation". Otherwise, it is "Partial Mediation".

For the purpose of this study, a set of three regression models was implemented in order to test the mediating role of agency costs on the relationship between corporate governance and firm performance, as illustrated in *Figure 3-2* below. In the first regression model (1), the direct association between corporate governance as the independent variable and firm performance as the dependent variable were examined [Hypothesis 1]. The second regression model (2) aimed to explore the impact of corporate governance on agency costs as the dependent variable [Hypothesis 2]. Finally, in the third regression model (3), the relationship between corporate governance and firm performance was explored again with the existence of agency costs as a mediator [Hypothesis 4], in which the association between agency costs and firm performance was investigated in the same regression model [Hypothesis 3] (*Figure 3-2*).

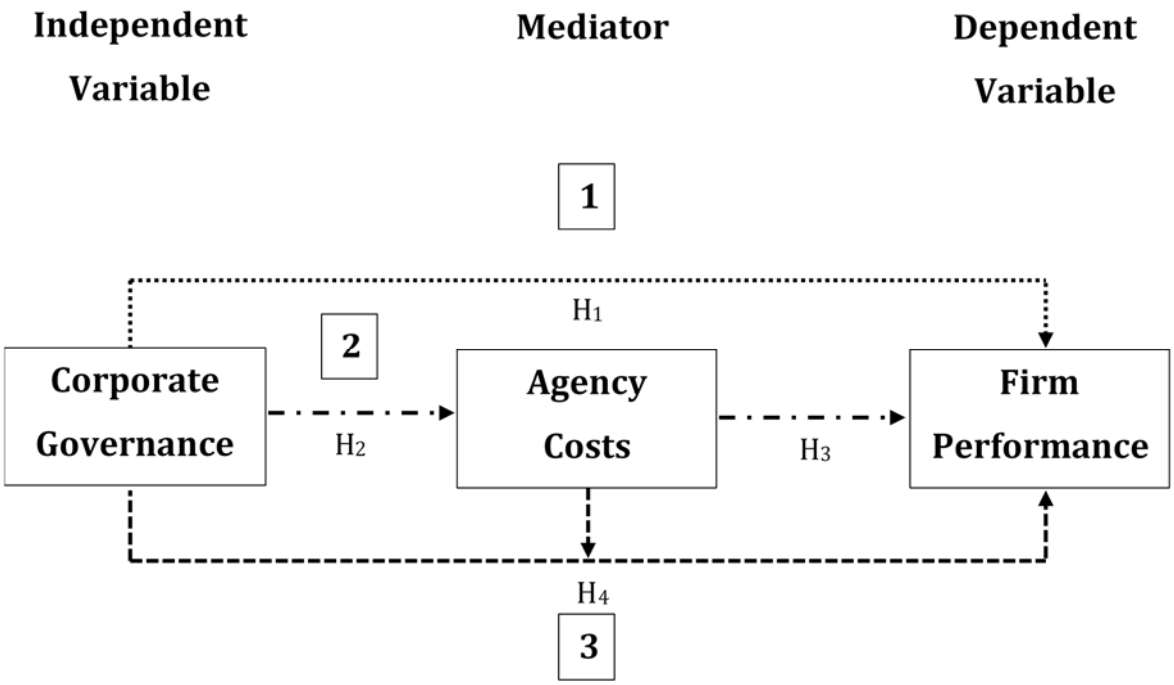

Figure 3-2: The Mediating Effect of Agency Costs on the Governance-Performance Relationship
*(**Source**: the researcher's interpretation of the suggested framework of the mediation relationship between corporate governance, agency costs and firm performance.)*

3.3.3 Sample Selection and Data Sources

Similar to the second chapter, the sampling frame for this study was extracted from FAME, a database that contains comprehensive information on companies in the UK and Ireland, and included all the 657 active insurance firms in the UK at the end of year 2014, both listed and private companies, and life, non-life, or composite. Moreover, those companies were either fully independent companies, parents of other subsidiaries, or subsidiaries of other companies, which they have been authorised either by the UK [the Financial Conduct Authority (FCA)/ the Prudential Regulation Authority (PRA)], or by the European Economic Area (EEA). Given the statistical technique employed, firms for which the UK was not the main market, and firms with no insurance data available from the annual reports, were excluded. For public-quoted companies, the firms also had to be listed at least for a year before the date of their accounting year end in 2003, to ensure that performance, capital structure and ownership were not affected due to a new listing (Short and Keasey, 1999).

These sample selection criteria led to a sample of 67 firms including 27 listed companies, with a total of 647 firm-year observations during the period 2004 – 2013. It started in 2004, which was the year following the release of the UK Corporate Governance Combined Code in 2003, and ended in 2013, the most recent year forwhich data was available at the time of data collection. Finally, information about the UK insurance firms, such as group status, UK Authorised, Listing in London Stock Exchange (LSE) or other international stock markets, was all obtained from the FAME database. On the other hand, due to the lack of a reliable secondary

data source, all corporate governance data, major shareholders info, and most performance data, including insurance-related indicators, such as premiums, claims and combined ratio, was hand-collected from the annual reports of the companies within the sample. For some companies, where the directors' biographical data, board independence, board experience, and board out directorships was missing, other data sources were used, such as the FAME database, LinkedIn, DueDil.com (B2B Lead Generation-UK and Ireland), and endole.co.uk (UK Companies Info).

3.3.4 Variables: Description and Measurement

The key variables used in this study were the research's corporate governance index, which consists of 35 binary variables across five sub-indices, agency costs and firm performance measures. Additional variables were added to the regression in order to control the effects on firm performance, which had not been captured by the corporate governance index and agency costs. A summary of all variables and their definitions as used in this study are presented in *Table 3-1*, below, while, the CG statements of the research's built corporate governance index (UKCGI) can be found in *Table 3-2*. Most measures of firm performance, agency costs, and the statements of corporate governance were estimated at the end of each year over the period 2004 to 2013.

Table 3-1: List of Variables

Variable Name	Label	Value	Source
Firm Performance			
ROA	Return on Assets	Net Income / Total Assets	FAME & Annual Reports
ROE	Return on Equity	Net Income / Shareholders' Equity	FAME & Annual Reports
Agency Costs			
AGNCYCOSTS_ASSETTRNOVR	Agency Costs (Based on Asset Turnover Ratio)	Maximum Asset Turnover for the whole sample - Asset Turnover Ratio for a specific firm Where: Asset Turnover Ratio = (Premiums Earned + Net Investment Income) / Total Assets	FAME & Annual Reports
UK Corporate Governance Index			
UKICGI	UK Corporate Governance Index	consists of 35 binary statements categorised into 5 sub-indices	Prepared and Compiled by the Researcher based on the UK CG Code 2003-2012
UKCGI_PSBL	UKCGI (Possible Score)	= = = With missing values considered as "Zero"	===
UKCGILDRSHP_SUB	Board Leadership	consists of 7 binary statements	===
UKCGIEFCTVNS_SUB	Board Effectiveness	consists of 7 binary statements	===
UKCGIACNTBLTY_SUB	Board Accountability	consists of 7 binary statements	===
UKCGIREM_SUB	Board Remuneration	consists of 7 binary statements	===
UKCGISHRHLDRS_SUB	Shareholders' Rights	consists of 7 binary statements	===

Variable Name	Label	Value	Source
Control Variables			
Firm_Size	Firm Size	Ln (Total Assets)	Annual Reports
LVRG_DE	Financial Leverage	Total Liabilities (Debt) / Shareholders' Equity	FAME & Annual Reports
Life_Dummy	Whether it only transacts long-term insurance	Yes=1, No=0 (if this 0, and Non-life 0 => Composite)	FAME, Bank of England, Annual Reports
Non_Life_Dummy	Whether it only transacts general insurance	Yes=1, No=0 (if this 0, and life 0 => Composite)	FAME, Bank of England, Annual Reports
UKCGCODE03	UK Corporate Governance Code 2003	"1" in years 2004, 2005 and 2006, "0" otherwise.	The Financial Reporting Council (FRC)
UKCGCODE06	UK Corporate Governance Code 2006	"1" in years 2007 and 2008, "0" otherwise.	FRC
UKCGCODE08	UK Corporate Governance Code 2008	"1" in years 2009 and 2010, "0" otherwise.	FRC
UKCGCODE10	UK Corporate Governance Code 2010	"1" in years 2011 and 2012, "0" otherwise.	FRC
UKCGCODE12	UK Corporate Governance Code 2012	"1" in years 2013, "0" otherwise.	FRC

I. Performance Measurement

Since this study included both listed and non-listed companies, only accounting-based measures were used as proxies for firm performance. Therefore, and in line with prior research, the return on assets (ROA), a widely used accounting measure of firm performance in the corporate governance literature (see Dalton *et al.*, 1998; Boardman, Shapiro and Vining, 1997; Core, Holthausen and Larcker, 1999; Kiel and Nicholson, 2003; Klapper and Love, 2004; Filatotchev, Lien and Piesse, 2005; Guest, 2009; Wang, 2010; Le and Buck, 2011; Munisi and Randøy, 2013; Andreou, Louca and Panayides, 2014), was selected as the main proxy for firm performance. Return on Assets (ROA) is an indicator of how efficient the manager of a firm is in using its assets to generate earnings. It is calculated as the ratio of earnings before interest and tax (net income) to total assets:

Return on Asset (ROA)

Return on Assets (ROA) = Net Income / Total Assets

Another performance proxy was used later on to check the robustness of the results. This measure was the return on equity (ROE), which measures the return for each sterling pound invested in the company. It is calculated as the ratio of net income to total shareholders' equity. It has been also a popular measure in the governance literature (see Tsoutsoura, 2004; Anderson and Gupta, 2009; Sami, Wang and Zhou, 2011; Vintila and Gherghina, 2012).

Return on Equity (ROE)

Return on Equity (ROE) = Net Income / Shareholders' Equity

II. Agency Costs Measurement

Agency costs were used as a dependent variable in hypothesis 2 (H2), an independent variable in hypothesis 3 (H3), and a mediator variable in hypothesis 4 (H4). To measure the absolute agency costs, Ang, Cole and Lin (2000) argued that a firm with a zero agency-cost must be observed to serve as the reference point of comparison for all other firms, in which the agency costs for a specific firm are the deviation in expenses from the zero agency-cost firm. According to Jensen and Meckling (1976), a zero agency-cost is a firm owned solely by a single owner-manager. Shareholders suffer from agency costs, Ang, Cole and Lin (2000) claim, when managers own less than 100 percent of the firm's equity due to management's shirking and perquisite consumption. Based on the prior literature, different measures have been used to estimate agency costs, such as the Asset Utilisation Ratio (see Ang, Cole and Lin, 2000; Singh and Davidson, 2003; Fleming, Heavey and Mccosker, 2005; Florackis, 2008; Florackis and Ozkan, 2009; McKnight and Weir, 2009; Henry, 2010; Wang, 2010), the Expense Ratio (see Ang, Cole and Lin, 2000; Wang, 2010), the Discretionary Expenditure Ratio (see Singh and Davidson, 2003; Fleming, Heavey and Mccosker, 2005; Florackis, 2008; Florackis and Ozkan, 2009; Henry, 2010; Wang, 2010), the Free Cash Flow Ratio (see Chung, Firth and Kim, 2005a; Chung, Firth and Kim, 2005b; Chen and Lin, 2006; McKnight and Weir, 2009; Henry, 2010), Net Operating Income Volatility (see Crutchley and Hansen, 1989; Wang, 2010; Khidmat and Rehman, 2014), and Net Income Volatility (see Crutchley and Hansen, 1989; Wang, 2010; Khidmat and Rehman, 2014). It is clear that the first three measures have been the most frequently used in the accounting and finance literature, namely, Asset Utilisation Ratio, Expense Ratio, and Discretionary Expenditure Ratio.

Firstly, the 'Asset Utilisation Ratio', or Asset Turnover Ratio, is calculated as the annual total revenue divided by total assets (Ang, Cole and Lin, 2000; Singh and Davidson, 2003; McKnight and Weir, 2009; Henry, 2010). This measure is an inverse proxy for agency costs, which measures the extent to which the management has been effective in using its assets. A lower asset turnover ratio means inefficient use of the assets, due to poor investment decisions or purchasing unproductive assets (Ang, Cole and Lin, 2000) and, thus, higher agency costs for shareholders. Secondly, the Expense Ratio, which is the ratio of operating expenses divided by annual total revenue (Singh and Davidson, 2003). This ratio measures how effectively the management controls the operating costs, including excessive perquisite consumption, and other direct agency costs (Ang, Cole and Lin, 2000). The third measure is the Discretionary Expenditure Ratio, which is measured as annual selling, general and administrative expenditure scaled by annual total revenue (Singh and Davidson, 2003; Henry, 2010). This ratio has replaced the Expense Ratio, since it includes all operating, general and administrative

expenses for which management has discretionary authority (Henry, 2010), such as salaries, rents, advertising and marketing. Agency costs can be then measured for a specific firm, as the difference in the chosen ratio between a firm whose manager is the sole equity owner and that specific firm (Ang, Cole and Lin, 2000).

For the purpose of this study, only 'Asset Turnover Ratio' was used to estimate agency costs, due to data availability and the degree of detail required and existed in the annual reports for all the sample firms. Asset turnover ratio also estimates the extent to which the management has been effective in making investment decisions, and purchasing productive assets, which made it more likely to capture the level of agency conflicts that might exist between managers and shareholders (Truong and Heaney, 2013). However, since there was no firm with zero agency-costs, the relative agency costs were estimated as the difference in the asset turnover ratio between a specific firm and the firm with the maximum asset turnover ratio among the sample firms. The firm with the highest asset turnover ratio should represent the most effective firm when making investment decisions and managing its assets and, thus, the firm with the lowest agency costs.

Agency Costs (Based on Asset Turnover Ratio)

Agency Costs (Based on Asset Turnover Ratio) = Maximum Asset Turnover for the whole sample - Asset Turnover Ratio for a specific firm

Where:

Asset Turnover Ratio = Annual Total Revenue / Total Assets

III. Corporate Governance Measurement:

Because this study focused on the relationship between corporate governance and firm performance in the UK, the components of the UK Corporate Governance Index (UKCGI) were measured in a manner compliant with the UK Corporate Governance Code. The UKCGI consists of 35 statements broken down equally into five sub-indices, based mainly on the corporate governance combined code 2012, taking into account the mutual items among the different versions of the UK CG Code since 2003, in order for the index to be comparable over the study period 2004-2013, as well as the guidance for unlisted companies in the UK 2011. Those sub-indices, representing the main categories of the UK corporate governance code, are (1) Board Leadership, (2) Board Effectiveness, (3) Board Accountability, (4) Board Remuneration, and (5) Shareholders' Rights. The data for UKCGI was extracted from the actual disclosures in the annual reports of both listed and non-listed insurance companies. Annual reports, as one of the written company information sources, are considered to be a vital source of information for

large shareholders, especially institutional investors, when making their investment decisions (Hellman, 2005). Moreover, although there are other channels of communication, such as company websites and press releases, the use of the company annual report has been widely accepted as a measure of corporate governance (see Hellman, 2005; Black, De Carvalho and Gorga, 2012). Therefore, three stages were followed in order to properly create the UKCGI. The initial items were firstly selected after reviewing the previous literature and the UK CG codes from 2003 to 2012. Secondly, the CG items were scored and the composite CG index was calculated. Finally, the validity and reliability of the UKCGI were checked in order to make sure that this index did measure what it had been created to measure, and in a consistent manner.

1. Selecting CG Items

The first stage was to review the previous literature on the corporate governance indices, discussed previously in sub-section 2.1, in order to select the most important governance attributes that could be used to measure the quality of corporate governance. In general, both approaches of the corporate governance indices had some common themes: the board of directors, including board structure (Khanna, Kogan and Palepu, 2001; Cornelius, 2005; Black, Jang and Kim, 2006b; Ananchotikul, 2008), or board responsibilities (Khanna, Kogan and Palepu, 2001; Klapper and Love, 2004; Cornelius, 2005; Black, Jang and Kim, 2006b; Ananchotikul, 2008). Shareholder Rights were also important, in that all indices had sub-index devoted to Shareholder Rights (Khanna, Kogan and Palepu, 2001; Gompers, Ishii and Metrick, 2003; Black, Jang and Kim, 2006b; Ananchotikul, 2008). Another major element of corporate governance that was identified was the audit committee's performance (Klapper and Love, 2004; Cornelius, 2005; Black, Jang and Kim, 2006b). Finally, transparency and disclosure were identified as being very significant, since they increased shareholders' confidence in the company (Khanna, Kogan and Palepu, 2001; Klapper and Love, 2004; Black, Jang and Kim, 2006b; Ananchotikul, 2008).

Then, the initial CG items were chosen based on a thorough review of the recommendations of the UK CG Code (2012) and previous versions back to 2003 (FRC, 2003; FRC, 2006; FRC, 2008; FRC, 2010; FRC, 2012b), to select only the mutual items that were mutually existent in all versions, over the study period 2004-2013, in order for the final CG index to be comparable over time. A second selection was done based on the principles of corporate governance for unlisted companies in the UK (IoD, 2011), to keep the items with the most available CG information in the annual reports of both listed and non-listed companies included in the sample. Finally, in order to check the relevance of this index for measuring the quality of

corporate governance, the initial index was sent to two academics having a PhD[33], two colleagues whose main research focus is corporate governance[34], and one experienced board member[35], in order to refine the index and identify any gaps or inconsistencies. Another strategy for constructive suggestions was to attend several academic conferences and workshops, which significantly improved the content validity of the index. One example on the adjustments being done based on the received feedback was that, some items should have been moved to another category, such as 'The board should appoint one of the independent non-executive directors to be the senior independent director…', which was moved from the 'Board Composition, Leadership & Independence' sub-category to the 'Shareholders' Rights' sub-category. This is because the senior independent director is the key link with shareholders in case the normal channels have failed to resolve any concerns. Another suggestion was to remove the 'Disclosure & Transparency Rules' sub-category, since its statements are already included in the other five sub-categories. After several adjustments, a total of 35 statements were included, and divided into 5 sub-indices, which formed the final revised version of the UK Corporate Governance Index (UKCGI), as follows (*Table 3-2* below):

Table 3-2: UK Corporate Governance Index (UKCGI)'s Statements

No.	Statement	UK CG Code Provisions	UK CG Guidance and Principles for Unlisted Firms	Value Y=1, N=0
	Board Composition, Leadership & Independence			**Up to 7**
1	#The annual report should identify the Chairman, Chief Executive Officer (CEO) and Non-Executive Directors (NEDs).	A.1.2.	Principle 2	1, 0
2	#The board should identify in the annual report each non-executive director it considers to be independent.	B.1.1.	Principle 2	1, 0
3	#The annual report should identify the Chairmen and members of the three main board committees (nomination, audit & remuneration).	A.1.2.	Principle 4	1, 0
4	#The board should consists of 50% Independent non-executive directors at least (2 at least for small companies).	B.1.2.	Principle 10	1, 0
5	#The CEO and Chairman's duties should be separated (Board Non-Duality).	A.2.1.	Principle 3 + 10	1, 0
6	#The Chairman's other significant commitments should be disclosed to the board before appointment.	B.3.1.	Principle 3 + 10	1, 0
7	#The Chairman should be independent on appointment.	A.3.1.	Principle 3 + 10	1, 0
	Board Effectiveness			**Up to 7**
1	#The Company should have a secretary, and the access to its services and advice should be made available to all board members.	B.5.2.	Principle 2	1, 0
2	#All new directors joining the board should be given a full, official and tailored induction.	B.4.1.	Principle 8	1, 0
3	#The Company should arrange an appropriate insurance cover in respect of legal actions against its directors.	A.1.3.	Principle 2	1, 0
4	#The board and committees' members should have regular meetings during the year [For large companies: 8 board + 7 committees, For small companies: 4 board + 5	A.1.1.	Principle 4	1, 0

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[34] Alaa Al-Qudah, Tam Nguyen

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No.	Statement	UK CG Code Provisions	UK CG Guidance and Principles for Unlisted Firms	Value Y=1, N=0
	committees], including NEDs' meetings with Chairman only, or with the senior independent director only.			
5	#The company should have a nomination committee.	B.2.1.	Principle 12	1, 0
6	#The nomination committee's report should include its work description, key responsibilities, and terms of reference.	B.2.4.	Principle 12	1, 0
7	#The nomination committee should comprise of 50% independent NEDs at least.	B.2.1.	Principle 12	1, 0
	Board Accountability			**Up to 7**
1	#The company should have an audit committee.	C.3.1.	Principle 12	1, 0
2	#The audit committee's report should include its work description, key responsibilities, terms of reference should also be included, as well as its role and the authority, financial statements, external audit process, non-audit services, objectivity & independence.	C.3.2. & C.3.3.	Principle 12	1, 0
3	#The audit committee should comprise solely of Ind NEDs.	C.3.1.	Principle 12	1, 0
4	#The chairman should not chair the audit committee (But may be a member if independent on appointment in smaller companies).	C.3.1.	x	1, 0
5	#The audit committee should include at least one member with relevant financial experience.	C.3.1.	Principle 12	1, 0
6	#The company should, at least annually, review of the effectiveness of the company's internal control systems.	C.2.1.	Principle 2 + 6	1, 0
7	#If the external auditor provides non-audit services, an explanation of how auditor objectivity and independence is safeguarded.	C.3.8.	Principle 6 + 12	1, 0
	Board Remuneration			**Up to 7**
1	#The company should have a remuneration committee.	D.2.1.	Principle 12	1, 0
2	#The remuneration committee's report should include its work description, key responsibilities, and terms of reference should be included, as well as its role and the authority.	D.2.1.	Principle 12	1, 0
3	#The remuneration committee should comprise solely of Ind NEDs.	D.2.1.	Principle 12	1, 0
4	#The company chairman should not chair the remuneration committee (But may be a member if independent on appointment).	D.2.1.	x	1, 0
5	#The board should state in the annual report how performance evaluation of the board, its committees and its individual directors has been conducted.	B.6.1.	Principle 2 + 13	1, 0
6	#Remuneration for executive directors should be compared with pay and employment conditions elsewhere in the group, and with other companies' remuneration.	D.1. Supporting Principles	Principle 5	1, 0
7	#The company should set the notice or contract periods at one year or less.	D.1.5.	x	1, 0
	Shareholders' Rights			**Up to 7**
1	#There should be sufficient biographical details of the board of directors to enable shareholders to take an informed decision on their election or re-election.	B.7.1.	x	1, 0
2	#The board should appoint one of the independent non-executive directors to be the senior independent director, in case the normal channels of chairman, chief executive or other executive directors have failed to resolve any concerns they have.	A.4.1. & E.1.1.	x	1, 0
3	#The board should state the company's strategic aims, values and standards, its business model and strategy, and how the company generates or preserves value over the longer term.	C.1.1. & A.1 Supporting Principles	Principle 2 + 14	1, 0
4	#The board should state how it operates, its decision types and a strategic guideline, its business objectives, etc.	A.1.1. & C.1.2.	Principle 2 + 14	1, 0
5	#The directors should explain in the annual report their responsibility for preparing the annual report and accounts.	C.1.1.	Principle 2 + 14	1, 0
6	#The company should include a corporate governance statement, as well as a reference to the corporate governance code to which the company is subject, and a statement about compliance with that CG code.	DTR 7.2.1 R & DTR 7.2.9 R & DTR 7.2.4 G & LR 9.8.6 R	Principle 1 + 14	1, 0
7	#The board should state in the annual report the steps they have taken to ensure that board members have developed an understanding of the views of major shareholders about the company.	E.1.2.	Principle 7 + 14	1, 0

This table presents the 35 CG statements categorised equally into five CG sub-indices. Each of the CG statements has been scored using binary system in which for the UKCGI items, the value given is '1' for the presence of the measured criteria in the firm, and Zero '0' otherwise. However, If a firm did not report on a particular item of the UKCGI, this item has not been counted in the final score, while in the UKCGI_PSBL, the value Zero '0' has also been given for such statement.

[1] Board Composition, Leadership & Independence Sub-Index (UKCGSUB_LDRSHP) [7 items]

This sub-index covers three items related to board composition, while the other four items are related to board leadership and independence. According to the UK corporate governance, "*The annual report should identify the chairman, the deputy chairman (where there is one), the chief executive, the senior independent director and the chairmen and members of the board committees*" ***[Provision A.1.2.]*** (FRC, 2012b, p8). The board also should identify each non-executive director it considers to be independent ***[Provision B.1.1.]*** (FRC, 2012b). With regard to board independence, the UK code states that the board should consists of 50% independent non-executive directors at least, or two at least for smaller companies ***[Provision B.1.2.]*** (FRC, 2012b). Moreover, the roles of chairman and chief executive should not be exercised by the same individual (board non-duality) as a good indicator of the division of responsibilities between them ***[Provision A.2.1.]***. Finally, this sub-index examines whether the chairman was independent upon appointment ***[Provision A.3.1.]***, and whether his/her other significant commitments were disclosed prior to appointment ***[Provision B.3.1.]*** (FRC, 2012b).

[2] Board Effectiveness Sub-Index (UKCGSUB_EFCTVNS) [7 items]

This sub-index focuses on procedures that ensure board effectiveness. Firstly, the UK corporate governance code states that a board of directors should have sufficient regular meetings during the year to discharge its duties effectively ***[Provision A.1.1.]*** (FRC, 2012b). The chairman should also meet with the non-executives without the executives present, while the senior independent director should meet with the non-executives at least annually without the chairman present to appraise the chairman's performance, and on such other occasions as are deemed appropriate ***[Provision A.4.2.]*** (FRC, 2012b). Moreover, the code emphasises that the appointment of new directors to the board should follow a formal, rigorous and transparent procedure (FRC, 2012b) and, thus, this sub-index assesses also the existence of the nomination committee, and whether its independence has been met. According to the code, there should be a nomination committee leading the process for board appointments, in which a majority of members should be independent non-executive, and that committee should disclose its work description, key responsibilities and its terms of references ***[Provision B.2.1. & B.2.4.]*** (FRC, 2012b). Finally, this sub-index also assesses other practices related to the insurance cover that should be arranged in respect of legal action against its directors ***[Provision A.1.3.]***, the formal and tailored induction for all new board directors ***[Provision B.4.1.]***, and the importance of having a company secretary, to which all directors have access to its advice and services ***[Provision B.5.2.]*** (FRC, 2012b).

[3] Board Accountability Sub-Index (UKCGSUB_ACNTBLTY) [7 items]

This sub-index covers the accountability and audit issues, since the key aim of corporate governance is to strengthen the accountability of boards of directors to shareholders (Cadbury, 1992). Having an audit committee is required by the UK code; The board should establish an audit committee of at least three independent non-executives, or two in smaller companies, in which the independent chairman (on appointment) may be a member, but not chair, and that committee should disclose its work description, key responsibilities and its terms of references ***[Provision C.3.1.]*** (FRC, 2012b). This sub-index also examines whether the audit committee has at least one member with recent and relevant financial experience ***[Provision C.3.1.]*** (FRC, 2012b). Furthermore, other audit issues related to the review of the internal control system ***[Provision C.2.1.]*** and the independence of the audit firm providing non-audit services are also considered in this sub-index ***[Provision C.3.8.]***.

[4] Board Remuneration Sub-Index (UKCGSUB_REM) [7 items]

This sub-index focuses on the board remuneration processes as required by the corporate governance code, in order to make sure that the board has followed a formal process considering directors' remuneration. In this regard, the UK code indicates that the board should establish a remuneration committee of at least three independent non-executive directors, or two in the case of smaller companies, of which independent chairman (on appointment) may be a member, but not chair, and that committee should disclose its work description, key responsibilities and its terms of references ***[Provision D.2.1.]*** (FRC, 2012b). The corporate governance code also states that board remuneration should be sufficient to attract, retain and motivate directors to run the company successfully without overpaying for this purpose, and including a significant part as performance-related bonus ***[D.1. Main Principle]***. (FRC, 2012b). Therefore, the board, according the UK code (FRC, 2012b), should state in the annual report how performance evaluation of the board, its committees and its individual directors has been conducted ***[Provision B.6.1.]***, and make sure that the remuneration for executive directors has been compared with pay and employment conditions elsewhere in the group, and with other companies' remuneration ***[D.1. Supporting Principle]***. Finally, this sub-index also assesses whether the notice or contract periods have been set at one year or less ***[Provision D.1.5.]*** (FRC, 2012b).

[5] Shareholders' Rights Sub-Index (UKCGSUB_SHRHLDRS) [7 items]

Whilst by law a company is primarily accountable to its shareholders, the issue for corporate governance is how to strengthen the accountability of boards of directors to shareholders.

Hence, the main focus of the UK code is the relationship between the company and its shareholders, and how corporate governance can facilitate effective management that improve performance and maximise shareholders' returns (Fama and Jensen, 1983; Cadbury, 1992; FRC, 2003; FRC, 2006; FRC, 2008; FRC, 2010; FRC, 2012b). Therefore, this sub-index includes items related to this relationship, such as the availability of directors' biographical details, enabling shareholders to take an informed decision on their election or re-election ***[Provision B.7.1.]*** (FRC, 2012b) since "*the shareholders' role in governance is to appoint the directors to satisfy themselves that an appropriate governance structure is in place*" (FRC, 2012b, p1). The existence of a senior independent director is also important to shareholders if they have concerns which the normal channels of chairman, chief executive or other executive directors have failed to resolve ***[Provision A.4.1.]*** (FRC, 2012b). On the other hand, "the senior independent director should attend sufficient meetings with a range of major shareholders to listen to their views in order to help develop a balanced understanding of the issues and concerns of major shareholders" ***[Provision E.1.1.]*** (FRC, 2012b, p24). Moreover, the UK corporate governance code states that the board should state in the annual report the steps they have taken to ensure that all directors, especially non-executives, develop an understanding of the views of major shareholders about the company ***[Provision E.1.2.]*** (FRC, 2012b). Finally, this sub-index examines other arrangements related to the disclosure of company's strategic aims and its business model ***[A.1. Supporting Principle & Provision C.1.1.]***, how the board operates, strategic guidelines, business objectives ***[Provisions A.1.1. & C.1.2.]***, as well as directors' report of their responsibilities for preparing the annual report and accounts ***[Provision C.1.1.]***. It also assesses whether the company includes a corporate governance statement, as well as a compliance statement with the corporate governance code to which it is subject ***[DTR 7.2.1 R & DTR 7.2.9 R & DTR 7.2.4 G & LR 9.8.6 R]***.

2. Scoring CG Items and Calculating the UKCGI and its Sub-Indices

The second stage was to score the CG items and then calculate the composite CG index. Two approaches are widely used when scoring the CG items: weighted and unweighted scoring. In the weighted approach, a weighted score was applied to each item based on its importance. However, this approach has been criticised, due to the bias towards the moderator subjectivity when scoring the index (Balling, Holm and Poulsen, 2006). On the other hand, prior studies (Price, Román and Rountree, 2011; Black, De Carvalho and Gorga, 2012; Black, De Carvalho and Sampaio, 2014) have used the unweighted approach, where all CG items are considered to have the same importance and, thus, have been assigned equal weight. Therefore, in order to ensure objectivity and transparency (Florou and Galarniotis, 2007), this study adopted the unweighted approach, although the relative importance of the selected governance items may not be precisely reflected.

According to this approach, the CG items were scored using a binary system wherein each item was given '1' for the presence of the measured attribute in the firm, and Zero '0' otherwise. A UKCGI item was not been considered as a part of the index value if a firm did not report that particular item (Black, Jang and Kim, 2006b), since the sample included both listed and non-listed firms, and some items were compulsory only for listed firms, and were voluntary otherwise. However, another approach to deal with such missing information was that Zero '0' value was given for such undisclosed items, since non-reporting on a corporate governance element indicates poor governance (Ananchotikul, 2008; Khanna and Zyla, 2012). In this study, both approaches were used to construct the CG sub-indices, in which the first one with non-considered missing values [UKCGI] was the main index in this study, while the second one, with '0' missing values [*UKCGI_PSBL*], was used to check the robustness of the main results. Each CG sub-index was then calculated by adding all the actual scores for its items and dividing this sum by the maximum sub-score for each firm and, thus, each CG sub-index ranged between 0 and 1. The final UKCGI for each firm was estimated as the sum of CG items' actual scores divided by the maximum score this specific firm would get for full compliance with the UK CG code (*Table 3-2*).

UK Corporate Governance Index (UKCGI)

UKCGI = ∑ Actual Scores for CG Items / Maximum Score (without missing items)

Where for each statement: Y='1', N='0' (Non-disclosed items are not considered)

UK Corporate Governance Possible Index (UKCGI_PSBL)

UKCGI_PSBL = ∑ Actual Scores for CG Items / Maximum Score (with missing items)

Where for each statement: Y='1', N='0' (Non-disclosed items are considered '0')

3. Assessing the Validity and Reliability of the UKCGI

The constructed CG index has been proposed to measure the quality of corporate governance. Therefore, it was crucial to ensure that this index was a valid and accurate instrument to actually measure what it had been built to measure [i.e. Validity], in a consistent manner across different situations, ensuring stability over time [i.e. Reliability] (see Weir, 2005; Devon *et al.*, 2007; Hair *et al.*, 2007; Field, 2009; Sekaran and Bougie, 2010).

Regarding validity, Saunders, Lewis and Thornhill (2012) argued that three aspects of validity have to be assessed, namely, (1) *face validity*, (2) *content validity* and (3) *construct validity*. **Face validity** aims to ensure that the measurement tool looks as if it measures the concept that it is intended to measure (Devon *et al.*, 2007; Saunders, Lewis and Thornhill, 2012). However, face

validity is the weakest form of validity, due to its subjectivity (Trochim, 2001), although it does provide insight into how potential participants might interpret and respond to the items (Devon *et al.*, 2007). The face validity of the CG index was supported through the pre-testing, as discussed earlier in this chapter [see 1).Selecting CG Items].

C**ontent validity** aims to make sure that sufficient items have been included in the measurement tool (Devon *et al.*, 2007; Saunders, Lewis and Thornhill, 2012). The content validity of the CG index was indicated through reviewing the corporate governance literature, previous CG indices, the UK corporate governance codes and the guidance for unlisted companies in the UK, and finally, seeking expert opinion by using a panel of two academics, two colleagues whose main research focus is corporate governance, and one experienced board member, to subjectively judge which items were to be included in the proposed index (De Vaus, 2002).

Finally, **construct validity** ensures that the measurement tool actually measures the presence of those constructs intended to be measured (Devon *et al.*, 2007; Saunders, Lewis and Thornhill, 2012). In other words, the correlation between the total CG index and its component sub-indices had to be examined in order to assess the construct validity (see Black, De Carvalho and Gorga, 2012; Samaha *et al.*, 2012; Hassan, 2012). *Table 3-3* presents the Pearson correlation between UKCGI and its sub-indices, showing a positive significant association with coefficients ranging from 0.8385 to 0.9461. On the other hand, the inter-sub-indices correlation is positively significant but relatively low, except for the association of shareholders' rights with both board effectiveness and board accountability. This nearly touched 0.8, although (Pallant, 2011) considered independent variables to be highly correlated if r=0.9 and above, meaning that no multicollinearity exists between sub-indices.

Table 3-3: Pearson's Correlation between UKCGI and its Sub-Indices

Pairwise Pearson's Correlation	UKCGI	LDRSHP	EFCTVNS	ACNTBLTY	REM	SHRHLDRS
UKCGI	1.0000					
UKCGILDRSHP_SUB	0.8640	1.0000				
UKCGIEFCTVNS_SUB	0.8385	0.5703	1.0000			
UKCGIACNTBLTY_SUB	0.8409	0.6894	0.6068	1.0000		
UKCGIREM_SUB	0.8533	0.2445	0.7556	0.6171	1.0000	
UKCGISHRHLDRS_SUB	0.9461	0.7251	0.8001	0.8034	0.6178	1.0000

Where UKCGI: UK Corporate Governance Index, UKCGILDRSHP_SUB: Board Leadership Sub-Index, UKCGIEFCTVNS_SUB: Board Effectiveness Sub-Index, UKCGIACNTBLTY_SUB: Board Accountability Sub-Index, UKCGIREM_SUB: Board Remuneration Sub-Index, UKCGISHRHLDRS_SUB: Shareholders Rights Sub-Index.

On the other hand, reliability can be tested through different methods, such as the test-retest method (Stability Reliability), and the internal consistency method (Equivalence Reliability) (Weir, 2005; Devon *et al.*, 2007; Sekaran and Bougie, 2010; Collis and Hussey, 2013). The first method, test-retest reliability, was applied by repeating the scoring process by the researcher

and other three colleagues for 10 randomly selected firms after a short period of time and comparing the results, which were the same, suggesting that the UKCGI is reliable (Devon *et al.*, 2007; Saunders, Lewis and Thornhill, 2012). The second method, internal consistency, was used to assess how closely related a set of items are as a group when measuring the same issue (Litwin, 1995; Devon *et al.*, 2007). According to (Devon *et al.*, 2007; Easterby-Smith, Thorpe and Jackson, 2012), Cronbach's Alpha is the most popular measure of internal consistency and the only reliability index that can be performed with one test administration. Coefficient Alpha ranges from 0 to 1, in which the higher the alpha coefficient, the more reliable the research instrument (Devon *et al.*, 2007) although opinions differ about the ideal coefficient value, while Devellis (2003) claimed that a coefficient alpha of 0.70 was acceptable for new scales. In this study, the Cronbach's Alpha between the UKCGI and its-sub-indices (Leadership, Effectiveness, Accountability, Remuneration & Shareholders' Rights) was 0.8957, while the coefficient values between the statements for each sub-index were 0.7079, 0.8218, 0.3850, 0.7951, and 0.8824, respectively, suggesting that the UKCGI is a reliable index, with a slight concern about the board accountability sub-index (*Table 3-4*).

Table 3-4: Cronbach's Alpha Test between UKCG Sub-Indices, and between each Sub-Index's Components

Cronbach's Alpha	**UKCGI Sub-Indices**	**UKCGSUB_LDRSHP Statements**	**UKCGSUB_EFCTVNS Statements**	**UKCGSUB_ACNTBLTY Statements**	**UKCGSUB_REM Statements**	**UKCGSUB_SHRHLDRS Statements**
Average interitem covariance:	0.0513	0.0549	0.0603	0.0082	0.0405	0.0831
Number of items in the scale:	5	7	7	7	7	7
Scale reliability coefficient:	0.8957	0.7079	0.8218	0.3850	0.7951	0.8824

Control Variables

Additional variables have been widely used in the literature as control variables when investing the impact of either corporate governance or agency costs on firm performance, such as firm size (Short and Keasey, 1999; Ang, Cole and Lin, 2000; Le and Buck, 2011) (Hewa-Wellalage and Locke, 2011; Munisi and Randøy, 2013; Andreou, Louca and Panayides, 2014; Filatotchev, Lien and Piesse, 2005), financial leverage (Ang, Cole and Lin, 2000; Le and Buck, 2011; Munisi and Randøy, 2013; Andreou, Louca and Panayides, 2014), and industry type (Ang, Cole and Lin, 2000; Le and Buck, 2011; Hewa-Wellalage and Locke, 2011; Munisi and Randøy, 2013; Andreou, Louca and Panayides, 2014; Filatotchev, Lien and Piesse, 2005). For the purpose of this study, both firm size and financial leverage were included in order to reduce the influence of confounding factors (Hussainey and Al-Najjar, 2012). Firm size was calculated as the logarithm of total assets in order to capture the potential economies of scale and scope

accruing to large firms (Ang, Cole and Lin, 2000). Another way firm size might affect performance is the potential financing effect, in that larger firms might have the required funds internally, or even easier get them from external sources (Short and Keasey, 1999).

FZIZE (Firm Size)

Firm Size = LN (Total Assets)

Financial leverage is calculated as the ratio of debt to equity, since debt may affect performance as it reduces the free cash flow (Jensen, 1986), and high debt means debtholders monitor highly leveraged firms more closely and put pressure on such firms to adapt good governance practices (Broberg, Tagesson and Collin, 2010) (cited in Munisi and Randøy, 2013), while shareholders' equity is also related to problems between managers and shareholders.

LVRG_DE (Financial Leverage)

Financial Leverage = Total Debt / Shareholders' Equity

On the other hand, since only insurance firms were included, this study controlled for insurance line by using two dummy variables, life and non-life, to capture the possible variations in the levels of agency costs and the choice of corporate governance practice. The first dummy variable had the value '1' for firms selling life products only, and the other variable had '1' if firms were selling non-life products only (Diacon and O'sullivan, 1995), while assigning '0' for both variables indicated firms selling both life and non-life products (composite status).

LIFE, NONLIFE Dummy Variables

Life Company (Selling Life Products Only) ⟹ LIFE =1 & NONLIFE =0
Non-Life Company (Selling Non-Life Products Only) ⟹ LIFE =0 & NONLIFE =1
Composite Company (Selling Both Life & Non-Life Products) ⟹ LIFE =0 & NONLIFE =0

Finally, Himmelberg (2002) argued that environmental factors, such as legal efficiency and regulations can exogenously determine the choice of corporate governance practices. In the UK, the key exogenous factor is the UK Corporate Governance Code. Therefore, five dummy variables were added to the regression models in order to control for the effects of releasing an updated version of the UK Combined Code; 2003, 2006, 2008, 2010 and 2012. The '1' value

was then assigned to each dummy variable in the year after the release of its respective update until the release year of following update, and '0' otherwise, as follows:

UKCGCODE03 (UK CG Code 2003)

UKCGCODE03 = '1' if YEAR=2004-2006, '0' otherwise.

UKCGCODE06 (UK CG Code 2006)

UKCGCODE06 = '1' if YEAR=2007-2008, '0' otherwise.

UKCGCODE08 (UK CG Code 2008)

UKCGCODE08 = '1' if YEAR=2009-2010, '0' otherwise.

UKCGCODE10 (UK CG Code 2010)

UKCGCODE10 = '1' if YEAR=2011-2012, '0' otherwise.

UKCGCODE12 (UK CG Code 2012)

UKCGCODE12 = '1' if YEAR=2013, '0' otherwise.

3.4 Data Analysis and Discussion

This section presents the descriptive statistics, robustness checks, results of the model specifications, and regression results for the mediating effect of agency costs on the association between UK corporate governance index (UKCGI) and performance of UK insurance companies.

3.4.1 Descriptive Statistics

This sub-section presents an overview of the 67 sample firms over the period 2004-2013, and summarises the descriptive statistics for the corporate governance index, agency costs, firm performance and other control variables used in this study. Firstly, the following table provides an overview of the pooled sample firms (*Table 3-5*), in which the upper part includes firms' characteristics. The table shows that firm age ranged from one year to 112 years during the period 2004-2013 with an average age of around 42 years, while firm size differed according to the way it was estimated, based on either total assets or the number of staff. For example, firm size, based on the natural logarithm of total assets, ranged from around 9 to 20, with an average of around 15. The sample comprised 23 life (34%), 36 non-life (54%) and 8 composite insurance companies, on average, during the period 2004-2014. Almost 97% of the headquarters were based in the UK, 96% of the companies were authorised by the UK authorities (FSA/PRA), and around 61% of sample firms were members of the Association of British Insurers (ABI). Finally, only 30% were publicly quoted between 2004-2013, which means that 20 out of the 67 firms were listed in the London Stock Exchange (LSE) and/or in other stock markets (see *Table 3-5*).

On the other hand, board's characteristics for the sample firms are presented in the lower part (*Table 3-5*). In general, the average board size during the period 2004-2013 was around nine directors, with a minimum of two and a maximum of twenty-two directors. With regard to board structure, boards consisted of a majority (81%) of directors with UK nationality, while only 8.96% on average were female. Regarding board independence, *Table 3-5* shows that an average of 38% of board directors were independent non-executives, while only 15.35% of firms in the sample had the same person holding the positions of CEO and Chairman at the same time (Chair/CEO Duality), which is consistent with the recommendations of the Cadbury Report (Cadbury, 1992; FRC, 2014). In the terms of board experience, *Table 3-5* shows that the average board tenure ranged from a few months (0.17) to over ten years (10.35), with an average of around four years, while the average board age was a few months beyond 54 years old, with a minimum of 42 and a maximum of over 67 years old. Regarding board financial incentives and managerial ownership, the average board remuneration was about £250k per

year, and ranged from as little as £3,333 to a maximum of £1,271k, with an average of 33% paid to the highest paid directors, usually the CEOs. On the other hand, directors owned around 24% of the outstanding shares on average, although some firms had more than 59% managerial ownership, while the major shareholding ratio reached 76% on average. Finally, around 93% of sample firms used one of the big four audit firms[36], while the auditor independence ratio, calculated by the ratio of audit fees divided by the total fees paid to the external auditor, reached 73% on average (See *Table 3-5*).

Table 3-5: Overview of the Main Figures for the Pooled Sample

Variable	N	Median	Mean	SD	Min	Max
Firms' Characteristics						
FAGE	643	31	41.93	34.60	1	112
FSIZE_LN_A	647	14.53	14.80	2.14	8.87	19.73
FSIZE_LN_S	475	6.56	6.68	1.79	2.94	10.97
LIFE	647	0	0.34	0.47	0	1
NONLIFE	647	1	0.54	0.50	0	1
UKHDQRTR	647	1	0.97	0.16	0	1
UKAUTH	647	1	0.96	0.20	0	1
UKABI	647	1	0.61	0.49	0	1
LSTD_OR	647	0	0.30	0.46	0	1
LSTD_YEARS	165	11	15.74	14.57	1	49
Boards' Characteristics						
BRDSIZE	645	8	8.69	2.98	2	22
BRDUKRATIO	645	87.50%	80.60%	22.49%	0	1
BRDFMLRATIO	645	7.69%	8.96%	10.54%	0%	50%
INED	645	40%	38.16%	20.14%	0%	90%
BRDNONDLTY	645	1	84.65%	36.07%	0	1
BRDTNR	645	3.89	4.19	1.99	0.17	10.35
BRDAGE	645	55.15	54.29	4.88	41.95	67.71
BRDREM_AV	558	188	250.04	194.27	3.33	1,271.24
HPAIDDIR	551	33.02%	37.24%	15.39%	7.09%	93.83%
BRDOWN	647	1%	24.44%	28.67%	0%	59.09%
MJRSHRHLDRS	642	100%	76.34%	36.95%	0%	100%
AUDITORBIG4	647	1	92.89%	25.72%	0	1
AUDITORIND	636	74.27%	73.15%	22.10%	3.51%	100%

Where FAGE: Firm Age, FSIZE_LN_A: Firm Size = Ln (Total Assets), FSIZE_LN_S: Firm Size = Ln (Staff), LIFE: Life Dummy, NONLIFE: Non-Life Dummy, UKHDQRTR: Whether the headquarter is the UK, UKAUTH: Whether the company is authorised by the UK (FCA/PRA), UKABI: Whether the company is a member of the Association of British Insurers (ABI), LSTD_OR: Whether the company is listed (In the London Stock Exchange or another market), LSTD_YEARS: the number of years the company is listed, BRDSIZE: Board Size, BRDUKRATIO: Ratio of Board Members with UK Nationality, BRDFMLRATIO: Ratio of Board Female Members, INED: Ratio of Independent Non-Executive Directors, BRDNONDLTY: Whether CEO/Chairman are separated (Non-Duality), BRDTNR: Average Board

[36] The Big Four are the four largest international accountancy firms; PricewaterhouseCoopers (PwC), Deloitte, Ernst & Young (EY), and KPMG.

Tenure, BRDAGE: Average Board Age, BRDREM_AV: Average Board Remuneration, HPAIDDIR: Remuneration for the highest paid director, BRDOWN: Board Ownership Ratio, MJRSHRHLDRS: Ratio of Major Shareholders (3%). AUDITORBIG4: Auditor from Big 4 Audit Firms, AUDITORIND: Auditor Independence Ratio.

The following sub-sections illustrate the descriptive statistics, which present the main features of the data used in this study, such as mean, median, standard deviation, minimum, maximum, skewness and kurtosis.

I. UK Corporate Governance Index (UKCGI)

Below are the descriptive statistics of this study's new UK corporate governance index (UKCGI), and its sub-indices for the pooled sample (*Table 3-6*). Firstly, the UK Corporate Governance Index (UKCGI), calculated as the ratio of each company score to the total maximum score (excluding missing statements), ranged from 9% to 100% with an average of around 59%. On the other hand, the corporate governance possible index (UKCGI_PSBL), calculated by including missing items in the total maximum score, had a lower average (48%) and a lower minimum ratio (3%) (*Table 3-6*). Regarding the UK corporate governance sub-indices, board remuneration (UKCGIREM_SUB) had the highest average of around 83%, board accountability (UKCGIACNTBLTY_SUB) had the second highest (68%), while board effectiveness (UKCGIEFCTVNS_SUB), board leadership (UKCGILDRSHP_SUB), and shareholders' rights (UKCGIISHRHLDRS_SUB), had the lowest averages at 61.01%, 60.87%, and 54.10% respectively.

Table 3-6: UK Corporate Governance Index - Pooled Sample

Variable	N	Median	Mean	SD	Min	Max
UKCGI	647	47.37%	59.12%	26.25%	9.09%	100.00%
UKCGI_PSBL	647	27.14%	47.62%	33.22%	2.86%	100.00%
UKCGILDRSHP_SUB	647	57.14%	60.87%	28.01%	0.00%	100.00%
UKCGIEFCTVNS_SUB	647	66.67%	61.01%	28.80%	0.00%	100.00%
UKCGIACNTBLTY_SUB	647	50.00%	68.17%	25.97%	0.00%	100.00%
UKCGIREM_SUB	272	100.00%	82.85%	28.78%	0.00%	100.00%
UKCGISHRHLDRS_SUB	647	35.71%	54.10%	30.85%	0.00%	100.00%

Where UKCGI: UK Corporate Governance Index, UKCGI_PSBL: UKCGI (Possible Score) with missing values considered as "Zero", UKCGILDRSHP_SUB: Board Leadership Sub-Index, UKCGIEFCTVNS_SUB: Board Effectiveness Sub-Index, UKCGIACNTBLTY_SUB: Board Accountability Sub-Index, UKCGIREM_SUB: Board Remuneration Sub-Index, UKCGISHRHLDRS_SUB: Shareholders Rights Sub-Index.

More details about the UK CG index and its sub-indices over the period 2004-2013 are presented in *Table 3-7* below. In general, 10 firms on average (16%) did not disclose governance information in their annual reports at all, while of those who disclosed, the compliance ratio reached 72% overall. With regard to the sub-indices, board accountability (UKCGIACNTBLTY_SUB) had the highest non-disclosure ratio (49%), followed by board effectiveness (UKCGIEFCTVNS_SUB) with 31%, and marginal non-disclosure ratios for the other sub-indices (less than 1%). On the other hand, board remuneration (UKCGIREM_SUB)

and board accountability (UKCGIACNTBLTY_SUB) had the highest compliance ratio of the disclosed information (around 85% each), while shareholders' rights (UKCGIISHRHLDRS_SUB) had the worst non-compliance ratio so far (46%), followed by board leadership (UKCGILDRSHP_SUB) with an average of 39%.

Table 3-7: Descriptive Statistics for UK CG Sub-Indices

No.	Statement	Possible Score	Total Observations	Total Firms	No Disclosure	No Disclosure%	Compliance	Compliance%	No Compliance	No Compliance%
-	**UK Corporate Governance Index**	**35**	**647**	**65**	**10**	**16%**	**40**	**71.92%**	**17**	**28.08%**
[1]	Board Composition, Leadership & Independence Sub-Index	7	647	65	0.11	0.18%	39	61.00%	25	39.00%
[2]	Board Effectiveness Sub-Index	7	647	65	20	31%	48	73.76%	17	26.24%
[3]	Board Accountability Sub-Index	7	647	65	32	49%	55	85.30%	10	14.70%
[4]	Board Remuneration Sub-Index	7	256	26	0.12	0.46%	22	85.59%	4	14.41%
[5]	Shareholders' Rights Sub-Index	7	647	65	0.19	0.29%	35	53.96%	30	46.04%

II. Firm Performance and Agency Costs Variables

Table 3-8, below, represents the descriptive statistics of firm performance and agency costs measures. It shows that Return on Assets (ROA), as the main proxy of firm performance, ranged from a minimum of (-22.69%) to a maximum of 33.20% with an average of 2.65% for the whole sample. The other proxy for robustness check was Return on Equity (ROE), for which firms had an average return of 13.53% for every pound invested by shareholders with a maximum of around 86%. On the other hand, Agency costs based on the assets turnover ratio had an average ratio of 120%, with a maximum of 146% for the pooled sample.

Table 3-8: Descriptive Statistics for Firm Performance and Agency Costs

Variable	N	Median	Mean	SD	Min	Max
Firm Performance						
ROA	636	1.37%	2.65%	5.39%	-22.69%	33.20%
ROE	623	12.72%	13.53%	20.61%	-67.23%	86.43%
Agency Costs						
AGNCYCOSTS_ASSETTRNOVR	624	126.31%	120.50%	23.02%	0.00%	146.43%

Where: ROA: Return on Assets, ROE: Return on Equity, AGNCYCOSTS_ASSETTRNOVR: Agency Costs (Based on Asset Turnover Ratio).

III. Control Variables

The descriptive statistics of the control variables are presented for the pooled sample (*Table 3-9*). Firstly, the firm size, as the natural logarithm of total assets, ranged from around

'9' to '20', with an average of '15' approximately. On the other hand, the financial leverage, calculated as the ratio of debt to equity, swung from as low as '0' to a maximum of around '118', which was a huge ratio indicating that financing by debt in some firms had outweighed financing through shareholders' equity, with an average of about '12' only.

Table 3-9: Descriptive Statistics for Control Variables - Pooled Sample

Variable	N	Median	Mean	SD	Min	Max
FSIZE_LN_A	647	14.53	14.79	2.14	8.87	19.73
LVRG_DE	621	4.47	11.57	17.49	0.01	117.84
LIFE	647	0.00%	33.85%	47.36%	0.00%	100.00%
NONLIFE	647	100.00%	54.25%	49.86%	0.00%	100.00%

Where FSIZE_LN_A: Firm Size=Ln(Total Assets), LVRG_DE: Financial Leverage (Total Debt / Total Equity), LIFE: Life Dummy, NONLIFE: Non-Life Dummy

3.4.2 Robustness Checks

Prior to selecting which panel regression model to use, some robustness tests were carried out on the panel data in order to identify potential endogenous variables. For the purpose of this study, the correlation matrix has been drawn, followed by other three tests, which are multicollinearity, heteroscedasticity and serial correlation.

I. Correlation Matrix

With regard to the correlation matrix, either Pearson's or Spearman's Coefficients can be used depending on the achieved assumptions. The Pearson correlation coefficient is the most widely used. It measures the strength of the linear relationship between normally distributed variables. However, when the variables are not normally distributed or the relationship between the variables is not linear, it may be more appropriate to use the Spearman rank correlation method. Indeed, for the purpose of this study, both Spearman's and Pearson's Coefficients were estimated and are presented in *Table 3-10* below since there is no reliable test to check normality for relatively small samples. It can be seen from this table that no high correlation (r=0.9 or above) was found among the independent variables (Pallant, 2011), which suggested that there were no multicollinearity problems. On the other hand, a positive, but not significant, correlation was found between the UK corporate governance index (= 0.05) and the return on assets, suggesting that firms with good corporate governance would have improved performance (*Table 3-10*). A higher negative association was found between agency costs and firm performance, while firm size and financial leverage had a negative correlation with firm performance (*Table 3-10*).

Table 3-10: Correlation Matrix (Spearman's & Pearson's Correlations) [p<0.1]*

Spearman's\Pearson's	1	2	3	4	5	6	7	8	9	10	11	12
ROA	**1.0000**	0.0530	-0.2920*	-0.1835*	-0.2204*	-0.2508*	0.3199*	0.0894*	-0.0520	-0.0109	-0.0288	-0.0103
UKCGI	0.0578	**1.0000**	0.1359*	0.4125*	0.1292*	0.1268*	-0.2410*	-0.1009*	-0.0106	0.0242	0.0506	0.0635
AGNCYCOSTS_ASSETTRNOVR	-0.3729*	0.0004	**1.0000**	0.2903*	0.2857*	0.4159*	-0.3722*	-0.0413	0.0038	0.0325	0.0080	0.0025
FSIZE_LN_A	-0.1305*	0.3059*	0.3273*	**1.0000**	0.4664*	0.3246*	-0.4235*	-0.0380	-0.0427	0.0047	0.0467	0.0442
LVRG_DE	-0.4060*	0.2015*	0.3754*	0.5006*	**1.0000**	0.5235*	-0.5242*	0.0001	-0.0099	-0.0192	0.0164	0.0165
LIFE	-0.3264*	0.0331	0.4934*	0.2959*	0.6047*	**1.0000**	-0.7789*	-0.0189	0.0054	0.0079	0.0052	0.0034
NONLIFE	0.3969*	-0.1467*	-0.4231*	-0.3537*	-0.5989*	-0.7627*	**1.0000**	-0.0258	0.0072	0.0065	0.0100	0.0066
UKCGCODE03	0.1500*	-0.1029*	-0.0869*	-0.0367	0.0744*	-0.0167	-0.0342	**1.0000**	-0.3152*	-0.3182*	-0.3197*	-0.2126*
UKCGCODE06	-0.0622	-0.0445	0.0324	-0.0686*	-0.0678*	-0.0222	0.0366	-0.3080*	**1.0000**	-0.2563*	-0.2575*	-0.1713*
UKCGCODE08	-0.0336	0.0383	0.0288	0.0005	-0.0106	0.0211	-0.0050	-0.3192*	-0.2527*	**1.0000**	-0.2600*	-0.1729*
UKCGCODE10	-0.0689*	0.0561	0.0215	0.0624	0.0055	0.0095	0.0067	-0.3208*	-0.2540*	-0.2633*	**1.0000**	-0.1737*
UKCGCODE12	-0.0033	0.0827*	0.0186	0.0587	-0.0143	0.0125	0.0006	-0.2160*	-0.1710*	-0.1772*	-0.1781*	**1.0000**

Where ROA: Return on Assets, UKCGI: UK Corporate Governance Index, AGNCYCOSTS_ASSETTRNOVR: Agency Costs (Based on Asset Turnover Ratio), FSIZE_LN_A: Firm Size=Ln(Total Assets), LVRG_DE: Financial Leverage (Total Debt / Total Equity), LIFE: Life Dummy, NONLIFE: Non-Life Dummy, UKCGCODE03 – UKCGCODE12: UK Corporate Governance Codes (2003, 2006, 2008, 2010, 2012)'s Dummies.

II. Multicollinearity Test (VIF)

This study calculated the Variance Inflation Factor (VIF), which is used to identify the presence of multicollinearity, e.g. whether two or more variables are highly correlated, which might affect the estimation of the regression parameters (Hair *et al.*, 2009). The VIF test is written as follows (Wooldridge, 2002):

$$VIF = \frac{1}{1 - R_i^2}$$

Where:

R_i^2 is the unadjusted R^2 when you regress X_i against all the other independent variables in the model.

Therefore, if VIF result is bigger than 10, there is a problem with multicollinearity (Gujarati, 2003).

It can be easily seen from *Table 3-11* that the variance inflation factor (VIF) results for all regression models was less than 10, indicating that there was no problem with multicollinearity.

Table 3-11: Multicollinearity Test using Variance Inflation Factor (VIF) [Using UKCGI]

Model	Multicollinearity Test (VIF) *[if VIF<10 => there is no Multicollinearity problem]*
Model 01 (Y, X)	Mean VIF = **1.79**
Model 02 (M, X)	Mean VIF = **2.15**
Model 03 (Y, X, M)	Mean VIF = **2.07**

***Where**: Y = ROA, X = UKCGI, M = Agency Costs*

Given the relatively high correlations between some corporate governance sub-indices, this study calculated the VIF again for all the regression models using UK CG Sub-Indices (*Table 3-12*). The results also indicated no multicollinearity problems among the regression models when using UKCGI sub-indices, as follows:

Table 3-12: Multicollinearity Test using Variance Inflation Factor (VIF) [Using UK CG Sub-Indices]

Model	Multicollinearity Test (VIF) *[if VIF<10 => there is no Multicollinearity problem]*
Model 01 (Y, X)	Mean VIF = **2.77**
Model 02 (M, X)	Mean VIF = **2.74**
Model 03 (Y, X, M)	Mean VIF = **2.72**

***Where**: Y = ROA, X = UK CG Sub-Indices. M = Agency Costs*

III. Heteroscedasticity Test

The existence of heteroscedasticity is a major concern in the application of regression analysis, as it can invalidate statistical tests of significance that assume that the modelling errors are uncorrelated and uniform and, hence, that their variances do not vary with the effects being modelled (Johnston, 1972). Therefore, heteroscedasticity was tested in this study using the modified Wald statistic, which is also workable when the assumption of normality is violated, at least in asymptotic terms. *Table 3-13* and *Table 3-14* below show the results of the

heteroscedasticity test for all the regression models, which indicated no problem with heteroscedasticity.

Table 3-13: Heteroscedasticity Test [Using UKCGI]

Model	Modified Wald Test for Groupwise Heteroscedasticity *[if<0.05 => there is no Heteroscedasticity]*
Model 01 (Y, X)	Prob>chi2 = **0.0000**
Model 02 (M, X)	Prob>chi2 = **0.0000**
Model 03 (Y, X, M)	Prob>chi2 = **0.0000**

***Where**: Y = ROA, X = UKCGI, M = Agency Costs*

Table 3-14: Heteroscedasticity Test [Using UK CG Sub-Indices]

Model	Modified Wald Test for Groupwise Heteroscedasticity *[if<0.05 => there is no Heteroscedasticity]*
Model 01 (Y, X)	Prob>chi2 = **0.0000**
Model 02 (M, X)	Prob>chi2 = **0.0000**
Model 03 (Y, X, M)	Prob>chi2 = **0.0000**

***Where**: Y = ROA, X = UK CG Sub-Indices. M = Agency Costs*

IV. Serial Correlation Test

Autocorrelation, also known as serial correlation, is the cross-correlation of a signal with itself at different points in time (Zovko, 2008). In panel data, serial correlation in linear panel-data models biases the standard errors and causes the results to be less efficient (Drukker, 2003). With this regard, the Wooldridge test for autocorrelation in panel data was used in this study, and the results showed no problems with autocorrelation for all the regression models (*Table 3-15* and *Table 3-16*).

Table 3-15: Wooldridge Test for Autocorrelation in Panel Data [Using UKCGI]

Model	Wooldridge Test for Autocorrelation in Panel Data *[If<0.05 => Variables are not serially correlated]*
Model 01 (Y, X)	Prob>F = **0.0223**
Model 02 (M, X)	Prob>F = **0.0037**
Model 03 (Y, X, M)	Prob>F = **0.0222**

***Where**: Y = ROA, X = UKCGI, M = Agency Costs*

Table 3-16: Wooldridge Test for Autocorrelation in Panel Data [Using UK CG Sub-Indices]

Model	Wooldridge Test for Autocorrelation in Panel Data *[If<0.05 => Variables are not serially correlated]*
Model 01 (Y, X)	Prob>F = **0.0003**
Model 02 (M, X)	Prob>F = **0.0000**
Model 03 (Y, X, M)	Prob>F = **0.0002**

***Where**: Y = ROA, X = UK CG Sub-Indices. M = Agency Costs*

3.4.3 Model Specifications

Since this study used panel data to explore the mediating role of agency costs on the relationship between corporate governance and firm performance, some panel econometric

tests were carried out in order to determine the best panel model for each regression relationship. Those tests were the Hausman test, the Breusch-Pagan Lagrange Multiplier test (LM), the F-test, and finally, testing for time fixed effects (see Hausman, 1978; Gujarati, 2003; Greene, 2008; Breusch and Pagan, 1979; Lomax, 2007; Torres-Reyna, 2007)[37]. *Table 3-17* below presents a summary of the specification tests for all three regressions.

Table 3-17: Model Specifications for Mediation Analysis

Specification Test	Model 01	Model 02	Model 03
Hausman test for fixed versus random effects model *[If ≤0.05 ⍰ Fixed Effects]*	Prob>chi2 = 0.2721	Prob>chi2 = 0.0000	Prob>chi2 = 0.7301
Breusch-Pagan LM test for random effects versus OLS *[if≤0.05 ⍰ use Random Effects]*	Prob>chibar2 = 0.0000	-	Prob>chibar2 = 0.0000
F-Test for fixed effects versus OLS *[if Prob>F ≤0.05 ⍰ use Fixed Effects]*	-	Prob>F = 0.0001	-
Testparm (Testing for Time-Fixed Effects) *[if≤0.05 ⍰ time fixed_effects needed]*	-	Prob>F = 0.1019	-
Decision	**Random Effects**	**Fixed Effects**	**Random Effects**

[37] Prior to multiple regression analysis, some model specifications were implemented on the panel data in order to select the most suitable regression model/s for this study.:

I. Hausman Test

The Durbin–Wu–Hausman test (also called the Hausman specification test) is a statistical hypothesis test in econometrics, developed in 1978 by Jerry A. Hausman (Hausman, 1978), has to be done first in order to determine whether the panel regression belongs to the fixed effects or random effects model, which helps to capture the effects of firm and time specific heterogeneities (Gujarati, 2003). The Hausman test is calculated as follows:

$$H = (\beta RE - \beta FE)'[Var(\beta FE) - Var(\beta RE)]\text{-}1\ (\beta RE - \beta FE)$$

Where:

$\boldsymbol{\beta_{FE}}$ are the coefficient estimates of the time-varying covariates from the fixed effects model.

$\boldsymbol{\beta_{RE}}$ are the corresponding estimated coefficients from the random effects model.

$\boldsymbol{Var(\beta_{FE})}$ is the estimate of the asymptotic (large sample) variances and covariance of the estimated coefficients.

$\boldsymbol{Var(\beta_{RE})}$ is the analogous quantity for the estimate of .

Therefore, if there is no correlation between the independent variable(s) and the unit effects, then estimates of β in the fixed effects model (βFE) should be similar to estimates of β in the random effects model (βRE) (Greene, 2008). In other words, if the result is equal or less than 0.05, the null hypothesis is rejected and the fixed effects model should be used since there are no differences between the estimates of $\boldsymbol{\beta}$ whether using fixed or random effects.

Then, either the Breusch-Pagan test (for random effects) or the F-test (for fixed effects) have to be carried out in order to make sure that the chosen model is more appropriate than the pooled ordinary linear model (OLS), as follows:

II. Breusch-Pagan Lagrange Multiplier Test (LM)

The Breusch–Pagan Lagrange Multiplier test (LM) was developed in 1979 by Trevor Breusch and Adrian Pagan (Breusch and Pagan, 1979), and is used to check the model for random effects based on the simple OLS (pooled) estimator (Gujarati, 2003). If $\boldsymbol{\hat{u}_{it}}$ is the $_{it}^{\text{th}}$ residual from the OLS regression, then the Lagrange multiplier test for one-way random effects is:

$$LM = \frac{NT}{2\,(T-1)}\left[\frac{\sum_{i=1}^{N}[\sum_{t=1}^{T}\hat{u}_{it}]^2}{\sum_{i=1}^{N}\sum_{t=1}^{T}\hat{u}_{it}} - 1\right]^2$$

In which failure to reject the null hypothesis, i.e. the result is higher than 0.05, suggests that there are no significant differences across units and, thus, no panel effect, which means OLS regression has to be done instead.

III. F-Test

An F-test is any statistical test in which the test statistic has an F-distribution under the null hypothesis. It is most often used when comparing statistical models that have been fitted to a data set, in order to identify the model that best fits the population from which the data was sampled. Sir Ronald A. Fisher initially developed the statistic as the variance ratio in the 1920s (Lomax, 2007). Suppose the fixed effects model is formulated as follows:

$$\boldsymbol{\gamma_{it} = X'_{it}\beta + u_i + \varepsilon_{it}}$$

The null hypothesis of the F-test following fixed effects regression is that in the proposed model, the observed and unobserved fixed effects ($\boldsymbol{u_i + \varepsilon_{it}}$) are equal to zero, i.e. they are equal across all units. Therefore, rejecting this hypothesis, when Prob>F is equal or less than 0.05, means that the fixed effects are non-zero, so the composite error terms ($\boldsymbol{u_i + \varepsilon_{it}}$) are correlated.

IV. Testing for Time-Fixed Effects (Testparm)

Finally, in order to see if time fixed effects are needed when running a fixed effects model, a joint test is needed to check whether the time dummies for all years are equal to zero or not (Torres-Reyna, 2007). If so, no time fixed effects are needed. On the other hand. if the Prob>F is equal or less than 0.05, the null hypothesis is rejected, meaning that coefficients for all years are not jointly equal to zero and, thus, time fixed effects have to be added to the model.

Firstly, the Hausman test was performed on each model, in which the results could not reject the null hypothesis for the first and third models; hence, the use of random effects regression, while the second model rejected the null hypothesis, suggesting the use of fixed effects regression (*Table 3-17*). Secondly, by using the Lagrange Multiplier test (LM) for random effects, the results of first and third models rejected the null, suggesting that panel regression was necessary. The F-Test was used to test the second model for fixed effects, and found that fixed effects had to be used in this model, not the OLS regression (*Table 3-17*). Finally, by using Testparm for fixed effects, it was found that there was no need to add time fixed effects' dummies for the second regression model (*Table 3-17*).

3.4.4 Results and Discussion

This sub-section illustrates the main results drawn from the three regression models regarding mediation analysis, in which the coefficient values and P-values (in brackets) are presented and discussed. For each model, variables were statistically evaluated by their P-value, which was considered highly significant at 0.01, significant at 0.05, or marginally significant at 0.1. The coefficient value, on the other hand, represented the average change in the dependent variable for one unit of change in the predictor variable while holding other predictors in the model constant.

$$\boldsymbol{ROA_{it}} = \beta 0 + \beta 1*UKCGI + \beta 2*FSIZE\_LN\_A + \beta 3*LVRG\_DE + \beta 4*LIFE + \beta 5*NONLIFE + \beta 6*UKCGCODE03 + \beta 7*UKCGCODE06 + \beta 8*UKCGCODE08 + \beta 9*UKCGCODE10 + \beta 10*UKCGCODE12 + \alpha + \mu_i + \varepsilon_{it} \quad \textbf{Model 01}$$

$$\boldsymbol{AGNCYCOSTS\_ASSETTRNOVR_{it}} = \beta 0 + \beta 1*UKCGI + \beta 2*FSIZE\_LN\_A + \beta 3*LVRG\_DE + \beta 4*LIFE + \beta 5*NONLIFE + \beta 6*UKCGCODE03 + \beta 7*UKCGCODE06 + \beta 8*UKCGCODE08 + \beta 9*UKCGCODE10 + \beta 10*UKCGCODE12 + \alpha i + \varepsilon_{it} \quad \textbf{Model 02}$$

$$\boldsymbol{ROA_{it}} = \beta 0 + \beta 1*UKCGI + \beta 2*AGNCYCOSTS\_ASSETTRNOVR + \beta 3*FSIZE\_LN\_A + \beta 4*LVRG\_DE + \beta 5*LIFE + \beta 6*NONLIFE + \beta 7*UKCGCODE03 + \beta 8*UKCGCODE06 + \beta 9*UKCGCODE08 + \beta 10*UKCGCODE10 + \beta 11*UKCGCODE12 + \alpha + \mu_i + \varepsilon_{it} \quad \textbf{Model 03}$$

Where:

***ROA**: is the dependent variable, and **UKCGI**: is the independent variable.*

***AGNCYCOSTS_ASSETTRNOVR**: is the mediator in the third model, which has been considered as a dependent variable in the second model.*

***FSIZE_LN_A, LVRG_DE, LIFE, NONLIFE, UKCGCODE03, UKCGCODE06, UKCGCODE08, UKCGCODE10, UKCGCODE12**: are the control variables.*

β_0: is the intercept term, and β_1 to β_{12}: are the regression coefficients for independent variables.

α_i: is a group-specific constant term.

μ_i: is a group-specific random element.

ε_{it}: is the error term, i: is index for entity, and t: is index for time.

I. Mediation Analysis Results

A summary of the regression results is presented in *Table 3-18* and *Table 3-19*, and discussed in the next three sub-sections, in which the association between ROA (dependent), Corporate governance index and its sub-indices (independent), and agency costs based on asset turnover ratio (mediator) are mainly investigated. In the first sub-section, the effect of corporate governance on firm performance are examined. The second sub-section investigates whether corporate governance (UKCGI) affected the agency costs, while in the third sub-section, the mediating role of agency costs on the relationship between corporate governance and firm performance is reported and discussed, in which impact of agency costs on firm performance is also tested.

Table 3-18: Summary of the Mediation Analysis Results (ROA, UKCGI & Agency Costs)

	Model 01 Random Effects	**Model 02 Fixed Effects**	**Model 03 Random Effects**
VARIABLES	**ROA**	**AGNCYCOSTS**	**ROA**
UKCGI	0.0265*	-0.265***	0.018
	(0.076)	(0.000)	(0.234)
Agency Costs (Asset Turnover Based)			-0.0395***
			(0.001)
Firm Size (Assets LN)	0.00109	-0.0152*	0.002
	(0.569)	(0.079)	(0.413)
Leverage (Debt to Equity Ratio)	-0.000357	-0.000127	-0.000398*
	(0.105)	(0.893)	(0.079)
Life Dummy	0.000412	0.0326	0.009
	(0.974)	(0.692)	(0.473)
Non-Life Dummy	0.0305***	0.274***	0.0319***
	(0.009)	(0.000)	(0.005)
UK CG Code 2003	0.0127**	-0.0291	0.0122**
	(0.021)	(0.120)	(0.024)
UK CG Code 2006	-0.00186	-0.0115	-0.001
	(0.741)	(0.539)	(0.821)
UK CG Code 2008	0.00141	-0.00141	0.004
	(0.799)	(0.938)	(0.520)
UK CG Code 2010	-0.000823	-0.0105	-0.001
	(0.881)	(0.556)	(0.898)
UK CG Code 2012 = o,	-	-	-
Constant	-0.0212	1.420***	0.022
	(0.493)	(0.000)	(0.499)
Number of ID	**66**	**66**	**66**
Observations	**621**	**600**	**600**
R-squared (within)	**0.0299**	**0.0725**	**0.0416**
R-squared (between)	**0.2014**	**0.1957**	**0.2491**
R-squared (overall)	**0.1310**	**0.1184**	**0.1606**

pval in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3-19: Summary of the Mediation Analysis Results (ROA, UKCGI Sub-Indices & Agency Costs)

	Model 01 Random Effects	**Model 02 Fixed Effects**	**Model 03 Random Effects**
VARIABLES	**ROA**	**AGNCYCOSTS**	**ROA**
UKCGSI (Leadership Sub-Index)	0.0162	-0.0703*	0.006
	(0.122)	(0.089)	(0.534)
UKCGSI (Effectiveness Sub-Index)	0.0252*	-0.120**	0.0238*
	(0.053)	(0.035)	(0.062)
UKCGSI (Accountability Sub-Index)	0.00165	-0.262***	0.001
	(0.886)	(0.000)	(0.949)
UKCGSI (Remuneration Sub-Index)	0.0256*	-0.057	0.024
	(0.076)	(0.228)	(0.101)
UKCGSI (Shareholders' Rights Sub-Index)	0.0191	-0.284***	0.015
	(0.160)	(0.000)	(0.273)
Agency Costs_Asset Turnover Based			0.0407*
			(0.0588)
Firm Size (Assets LN)	-0.00304	-0.00511	-0.00173
	(0.288)	(0.751)	(0.560)
Leverage (Debt to Equity Ratio)	-0.000314	0.000433	-0.000731*
	(0.276)	(0.801)	(0.0570)
Life Dummy	-0.000407	0.0123	0.00843
	(0.952)	(0.436)	(0.242)
Non-Life Dummy	0.0364***	-0.0858**	0.0324***
	(7.57e-07)	(0.0424)	(2.41e-05)
UK CG Code 2003	0.0177***	-0.0270	0.0187***
	(0.00582)	(0.168)	(0.00425)
UK CG Code 2006	0.00351	0.00781	0.00487
	(0.698)	(0.639)	(0.633)
UK CG Code 2008	0.00553	0.00612	0.00578
	(0.356)	(0.640)	(0.354)
UK CG Code 2010	-0.00707	0.00730	-0.00746
	(0.152)	(0.310)	(0.145)
UK CG Code 2012 = o,	-	-	-
Constant	0.0433	-0.171	0.024
	(0.313)	(0.333)	(0.586)
Number of ID	**33**	**33**	**33**
Observations	**253**	**238**	**238**
R-squared (within)	**0.1487**	**0.1313**	**0.1658**
R-squared (between)	**0.4595**	**0.0381**	**0.4883**
R-squared (overall)	**0.3222**	**0.0170**	**0.3205**

pval in parentheses
*** p<0.01, ** p<0.05, * p<0.1

1. Regression Results of Corporate Governance and Firm Performance

The first regression model of the mediation analysis investigated the relationship between this study's corporate governance index and firm performance with other control variables included. Model [1] in *Table 3-18* showed a significant positive association between UKCGI and ROA at 10% significance level, with an R-squared value of 0.1310, in which firm performance increased by 0.03% when the firm improved its governance practices by 1%. This result is consistent with previous studies (see Gompers, Ishii and Metrick, 2003; Brown and Caylor,

2006; Bhagat and Bolton, 2008; Bozec and Bozec, 2012; Munisi and Randøy, 2013), which found a significant positive relationship, suggesting that firms with good corporate governance have better returns and improved operating performance (see also other studies investigating individual CG measures, such as Diacon and O'sullivan, 1995; Bhagat and Black, 1999; Klapper and Love, 2004; Le and Buck, 2011; Yoo and Jung, 2014). Therefore, the assumption of the first hypothesis [**H1**] was confirmed, indicating that corporate governance in the UK, measured by our CG index (UKCGI), was related to operating performance, measured by ROA.

On the other hand, the first regression model, using CG sub-indices rather than UKCGI, was run again in order to explore the effects of specific CG sub-indices on firm performance. However, Model [1], illustrated in *Table 3-19*, showed non-significant relationships among all sub-indices, except the board effectiveness and board remuneration sub-indices, which had significant positive effects on firm performance at a 5% significance level, with an R-squared value of 0.3222. This result suggested that firms with improved board effectiveness and remuneration would help to expand board success, and, hence, enhance firm performance, even if it was a slight increase by only 0.025% each of the ROA (*Table 3-19*). Therefore, the first condition of the mediation relationship was partly met. Finally, with regard to the control variables, the results showed a non-significant negative association of both firm size, measured by the logarithm of total assets, and financial leverage, measured by debt to equity ratio, on firm performance (Model [1] in both *Table 3-18* and *Table 3-19*).

2. Regression Results of Corporate Governance and Agency Costs

In the second regression model of the mediation analysis, the impact of corporate governance index on agency costs was examined. Model [2], shown in *Table 3-18*, illustrated a highly significant and negative association between UKCGI and agency costs at a 1% significance level, with an R-squared value of 0.1184, in which firms could reduce their agency costs, by 0.265% for 1% improvement in their corporate governance practices. This result confirmed the second hypothesis [**H2**], suggesting that the corporate governance index had a significant effect in reducing agency costs, consistent with the agency theory and previous studies, such as (Henry, 2010), who has found that compliance with the good practices of corporate governance had a substantial mitigating effect on agency costs. Other studies have also confirmed this negative relationship (Ang, Cole and Lin, 2000; Singh and Davidson, 2003; Florackis, 2008; McKnight and Weir, 2009).

On the other hand, it can be seen from Model [2] in *Table 3-19* that all the CG sub-indices, except board remuneration, had a significant negative impact on agency costs at various significance levels, of which board accountability and shareholders' rights had the highest association with

agency costs, at -0.26% and -0.28% respectively. These results suggest that improving governance practices in general would reduce agency costs, while focusing on board accountability and shareholders' rights would multiply this negative effect on agency costs. Therefore, the second condition of the mediation relationship, and thus the second hypothesis, was met when using either the UKCGI or its sub-indices, except for board remuneration. Finally, with regard to the control variables, Model [2], as shown in *Table 3-18*, shows a marginal significant positive impact of firm size on agency costs, at a 10% significance level, suggesting that larger companies have better asset turnover, and lower agency costs. On the other hand, financial leverage had a non-significant relationship with agency costs, which meant that reduced leverage had nothing to do with agency costs. However, neither firm size nor financial leverage had any relationship with agency costs when using the CG sub-indices rather than the aggregated UKCGI (Model [2] in *Table 3-19*).

3. Regression Results of the Mediating Role of Agency Costs on Corporate Governance-Firm Performance Relationship

Finally, in order to examine whether agency costs mediated the association between corporate governance and firm performance, a mediation test was conducted, as described by Baron and Kenny (1986), who suggested that certain conditions have to be met in order to confirm the mediation relationship. Firstly, there should be a significant relationship between the independent and dependent variables. Secondly, there should be a significant relationship between the independent variable and the mediator, as dependent variable. Thirdly, there should be a significant relationship between the mediator and the dependent variable, while the association between the independent and dependent should be moderated after including the mediator as an additional independent variable in the same regression.

The first condition was tested, and a significant association between corporate governance (independent) and firm performance (dependent) was found, and so the first hypothesis [**H1**] was then confirmed (Model [1] in both *Table 3-18* and *Table 3-19*). Then, corporate governance (independent) was found to affect agency costs (mediator, but treated as dependent), which meant that the second condition was also met, and that the second hypothesis [**H2**] was confirmed, except for board remuneration (Model [2] in both *Table 3-18* and *Table 3-19*). Thirdly, including agency costs as an extra independent variable in the governance-performance regression, the first part of third condition was confirmed by the significant association between agency costs and firm performance (*Table 3-18* and *Table 3-19*). Model [3] in *Table 3-18* and *Table 3-19* indicates a very significant positive association between agency costs and ROA at a 1% significance level, with an R-squared value of 0.1606 (0.3205 when using CG sub-indices), by which reducing agency costs by 1% led to enhancing ROA by 0.04%. This result

was consistent with the assumption of agency theory that agency costs are significantly negatively associated with firm performance, which means that firms suffering lower agency problems tend to have a better operating performance. Prior studies have also revealed a negative association between agency costs and firm performance (Boardman, Shapiro and Vining, 1997; Gompers, Ishii and Metrick, 2003; Berger and Di Patti, 2006; Xiao and Zhao, 2009; Wang, 2010) and, thus, the first part of the third condition was met, and the third hypothesis [**H3**] was confirmed.

On the other hand, the second part of third condition suggested that, assuming other conditions have been met, if the relationship between corporate governance and firm performance becomes insignificant when the agency costs are included, it can be argued that the impact of corporate governance is perfectly mediated by agency costs. However, if the effect of corporate governance remains significant, even if reduced, it is suggested that governance-performance association is partially mediated, while there is no mediation effect if any of the above conditions have been violated (Baron and Kenny, 1986; Le and Buck, 2011; Huang, Wang and Wang, 2015; Spencer and Adams, 2013). Model [3], as depicted in in *Table 3-18*, showed no influence of corporate governance on firm performance with agency costs included in the regression, which supported the second part of the third condition, and confirmed the forth hypothesis [**H4**], suggesting that the relationship between corporate governance and firm performance was fully mediated by agency costs. This result is consistent with the previous two studies which have explored this relationship using individual corporate governance arrangements, and which found that agency costs mediate the relationship between state ownership (Le and Buck, 2011), or external governance (Huang, Wang and Wang, 2015), and firm performance. On the other hand, with the UKCGI broken down into its five sub-indices, Model [3], as shown in in *Table 3-19*, confirms that a significant association between board effectiveness and ROA still existed, although reduced, after including agency costs, suggesting a partial mediation of agency costs on the relationship between board effectiveness and firm performance, and confirming the fourth hypothesis [**H4**]. However, the mediation role of board remuneration was not met, although the relationship between board remuneration and firm performance became insignificant when agency costs were included in the regression, because the second condition was not met, in that there was no relationship between board remuneration and agency costs.

II. Post-Robustness Checks

This sub-section discusses how post-robustness checks were carried out in order to test the previous results. **Firstly**, another regression was done between the mediator and the dependent variable without the independent variable, in order to make sure that the relationship was purely significant. Again, it was clearly seen from the results, that agency costs mediated the association between corporate governance index and firm performance (*Table 3-20*). **Secondly**, as discussed previously, the corporate governance index (UKCGI) was calculated again, including the missing values as 'Zero' if a firm did not disclose a specific item, which resulted in the UK Corporate Governance Possible Index (UKCGI_PSBL). The results of this mediation analysis confirmed the mediating effect of agency costs on the relationship between the corporate governance index, in whatever way it has been calculated, and firm performance (Table 3-21). **Thirdly**, another proxy for firm performance was used, which was the return on equity ratio (ROE), in order to eliminate any expected collinearity between return on assets and the agency costs. The results of this mediation analysis were consistent with the previous results, confirming the mediating role of agency costs on the association between corporate governance index and firm performance (Table 3-22). **Finally**, although the data set was checked for outliers resulting from estimation and/or entry errors, there were still some real outliers that normally exist in the sampling frame from which the sample has been extracted. Therefore, the whole mediation analysis was implemented again after treating such outliers[38] in order to investigate their effects. The results confirmed the significant relationship between corporate governance and firm performance, indicating that the outliers had no effect on the governance-performance relationship. Moreover, this significant association did not change, although the effect was reduced, with agency costs as a mediator, suggesting a partial mediation relationship (Table 3-23) and. thus, no need to exclude outliers.

[38] Through winsorizing or by using IQR (interquartile range).

Table 3-20: Post-Robustness Check - Mediation Analysis Results (ROA & Agency Costs)

VARIABLES	Random Effects ROA
UKCGI	
Agency Costs_Asset Turnover Based	-0.0397*** (0.000542)
Firm Size (Assets LN)	0.00219 (0.236)
Leverage (Debt to Equity Ratio)	-0.000430* (0.0591)
Life Dummy	0.00834 (0.515)
Non-Life Dummy	0.0304*** (0.00855)
UK CG Code 2003	0.0110** (0.0371)
UK CG Code 2006	-0.00197 (0.722)
UK CG Code 2008	0.00307 (0.573)
UK CG Code 2010	-0.00105 (0.846)
UK CG Code 2012 = o,	-
Constant	0.0250 (0.445)
Observations	600
R-squared	
Number of ID	66

pval in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3-21: Post-Robustness Check - Mediation Analysis Results (ROA, UKCGI_PSBL & Agency Costs)

VARIABLES	(1) Model 01 Random Effects ROA	(2) Model 02 Fixed Effects AGNCYCOSTS_ASSETTRNOVR	(3) Model 03 Random Effects ROA
UKCGI_PSBL (Possible Index)	0.0127	-0.176***	0.00744
	(0.284)	(0.00342)	(0.522)
Agency Costs_Asset Turnover Based			-0.0399***
			(0.000505)
Firm Size (Assets LN)	0.00152	-0.0170*	0.00187
	(0.428)	(0.0509)	(0.319)
Leverage (Debt to Equity Ratio)	-0.000372*	-3.46e-05	-0.000412*
	(0.0928)	(0.971)	(0.0703)
Life Dummy	2.99e-06	0.0334	0.00880
	(1.000)	(0.687)	(0.489)
Non-Life Dummy	0.0298**	0.276***	0.0314***
	(0.0112)	(1.09e-05)	(0.00659)
UK CG Code 2003	0.0120**	-0.0252	0.0116**
	(0.0292)	(0.179)	(0.0311)
UK CG Code 2006	-0.00241	-0.00776	-0.00166
	(0.667)	(0.679)	(0.765)
UK CG Code 2008	0.001000	0.00115	0.00326
	(0.857)	(0.949)	(0.551)
UK CG Code 2010	-0.00109	-0.00893	-0.000892
	(0.844)	(0.618)	(0.870)
UK CG Code 2012 = o,	-	-	-
Constant	-0.0167	1.368***	0.0252
	(0.589)	(0)	(0.439)
Observations	621	600	600
R-squared		0.066	
Number of ID	66	66	66

pval in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3-22: Post-Robustness Check - Mediation Analysis Results (ROE, UKCGI & Agency Costs)

VARIABLES	(1) Model 01 Random Effects ROE	(2) Model 02 Fixed Effects AGNCYCOSTS_ASSETTRNOVR	(3) Model 03 Random Effects ROE
UKCGI	0.0746	-0.265***	0.0505
	(0.181)	(0.000478)	(0.393)
Agency Costs_Asset Turnover Based			-0.113**
			(0.0177)
Firm Size (Assets LN)	0.0146**	-0.0152*	0.0184**
	(0.0448)	(0.0790)	(0.0154)
Debt to Equity Ratio	-0.00128	-0.000127	-0.00158*
	(0.136)	(0.893)	(0.0898)
Life Dummy	0.0557	0.0326	0.0777
	(0.225)	(0.692)	(0.126)
Non-Life Dummy	0.0892**	0.274***	0.0846*
	(0.0411)	(1.16e-05)	(0.0671)
UK CG Code 2003	0.0658***	-0.0291	0.0654***
	(0.00500)	(0.120)	(0.00418)
UK CG Code 2006	-0.0481**	-0.0115	-0.0293
	(0.0460)	(0.539)	(0.216)
UK CG Code 2008	0.00646	-0.00141	0.00949
	(0.786)	(0.938)	(0.683)
UK CG Code 2010	-0.0125	-0.0105	-0.00961
	(0.597)	(0.556)	(0.677)
UK CG Code 2012 = o,	-	-	-
Constant	-0.183	1.420***	-0.0928
	(0.116)	(0)	(0.482)
Observations	618	600	597
R-squared		0.072	
Number of ID	66	66	66

pval in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3-23: Post-Robustness Check - Mediation Analysis Results without OUTLIERS

	(1)	(2)	(3)	(4)
	Model 01 Random Effects	Model 02 Fixed Effects	Model 03 Random Effects	Model 04 Random Effects
VARIABLES	ROA	AGNCYCOSTS_ASSETTRNOVR	ROA	ROA
UKCGI	0.0184*	-0.190***	0.0173*	
	(0.0513)	(0.00310)	(0.0625)	
AGNCYCOSTS_ASSETTRNOVR			-0.0427***	-0.0433***
			(1.62e-07)	(1.35e-07)
Firm Size (Assets LN)	0.000561	-0.0161*	0.000783	0.00151
	(0.674)	(0.0571)	(0.551)	(0.241)
LVRG_DE_q	-0.000512*	-0.000572	-0.000452	-0.000536*
	(0.0802)	(0.713)	(0.117)	(0.0630)
Life Dummy	0.00275	0.0595	0.00881	0.00836
	(0.742)	(0.458)	(0.290)	(0.330)
Non-Life Dummy	0.0208***	0.111*	0.0195**	0.0174**
	(0.00838)	(0.0714)	(0.0120)	(0.0287)
UK CG Code 2003	0.00794**	-0.0399**	0.00719*	0.00593
	(0.0403)	(0.0250)	(0.0582)	(0.111)
UK CG Code 2006	-0.00529	0.0162	-0.00374	-0.00437
	(0.183)	(0.363)	(0.338)	(0.259)
UK CG Code 2008	-0.00220	0.00874	-0.00127	-0.00175
	(0.576)	(0.617)	(0.742)	(0.648)
UK CG Code 2010	-0.00405	0.00870	-0.00346	-0.00377
	(0.301)	(0.615)	(0.367)	(0.322)
UK CG Code 2012 = o,	-	-	-	-
Constant	-0.00184	1.514***	0.0459**	0.0488**
	(0.929)	(0)	(0.0391)	(0.0322)
Observations	647	647	647	647
R-squared		0.065		
Number of ID	67	67	67	67

pval in parentheses

*** p<0.01, ** p<0.05, * p<0.1

3.5 Conclusion

This section presents the research findings of the mediation analysis for agency costs on the governance-performance relationship, emphasises the research contributions, highlights the limitations and, finally, suggests recommendations for further research.

3.5.1 Research Findings

The purpose of this study was to examine the impact of our built UK corporate governance index (UKCGI), and its sub-indices, on firm performance of insurance companies during the period 2004 to 2013. The mediating role of agency costs on this relationship were also investigated, in which agency costs were estimated based on the asset turnover ratio. The panel data set used in this study was hand-collected, mainly from the annual reports of 67 UK insurance firms, consisting of both listed and non-listed companies and, thus, only accounting-based performance measures were used in this study. Therefore, the return on assets (ROA) was chosen as the main proxy of firm performance in addition to the return on equity (ROE), which was used to check the robustness of the results. The UK corporate governance index consists of 35 statements categorised equally into five sub-indices representing the main aspects of the UK corporate governance code. Those sub-indices are board leadership, board effectiveness, board accountability, board remuneration and shareholders' rights. Finally, various model specifications were carried out in order to select the best model for the three panel regressions examining the mediating role of agency costs on governance-performance relationship; hence the choice of random effects model for the first and third regressions (Governance-Performance & Governance-Agency Costs-Performance), and fixed effects model for the second regression (Agency Costs-Performance). The main findings of those three regression models using the aggregated index (UKCGI) were then summarised, followed by the regression results using the UK CG sub-indices, as follows:

I. Main Research Findings

In the first stage, three regression models were run in order to investigate the mediating role of agency costs on the relationship between the UK corporate governance index (UKCGI) and firm performance. The first model confirmed the first hypothesis (H1), indicating that our built corporate governance index had a significant positive impact on firm performance of insurance companies in the UK (*Table 3-18*). The second model, which was concerned with the impact of corporate governance index on the agency costs, confirmed the second hypothesis (H2), suggesting a significant negative association between corporate governance and agency costs (*Table 3-18*). The third and fourth hypotheses (H3 + H4) were confirmed in the third regression

model, which examined the relationship between the corporate governance index, agency costs and firm performance (*Table 3-18*). In other words, the results indicated a highly negative significant impact of agency costs on firm performance, while the significant association between corporate governance and firm performance became insignificant, suggesting that governance-performance relationship is fully mediated by agency costs.

II. Research Findings for UK CG Sub-Indices

In the second stage, the previous mediation analysis was re-run using the sub-indices of the UK corporate governance index in order to examine the specific effect of each sub-index on firm performance in the presence of agency costs as a mediator. The first regression model confirmed the first hypothesis (H1) for only board effectiveness and board remuneration, which had a significant positive impact on firm performance, suggesting that improved board effectiveness and remuneration would help to enhance firm performance (*Table 3-19*). In the second regression, all sub-indices, except board remuneration, were proved to have a significant negative association with agency costs, which confirmed the second hypothesis (H2) except for the board remuneration sub-index (*Table 3-19*). The third hypothesis (H3) had already been confirmed in the third regression (*Table 3-18* and *Table 3-19*), while the fourth hypothesis (H4) was only confirmed for board effectiveness, suggesting that agency costs played a partial mediating role in the relationship between board effectiveness and firm performance.

3.5.2 Research Contributions & Policy Implications

This study has proved that our built corporate governance index (UKCGI) reflected a positive association between the corporate governance and firm performance of UK insurance companies over the period stretching between 2004 and 2013. In particular, the first core contribution of this analysis was that unlike other commercial and academic rating scores, our new corporate governance index (UKCGI), to the best knowledge of the researcher, is the first and only index that covers both listed and non-listed firms. On the other hand, although there have only been two studies that have examined the mediation role of agency costs on the governance-performance relationship, this study is still the first to investigate this mediation relationship using an aggregated corporate governance measure (i.e. UKCGI) rather than individual CG arrangements. The results have suggested that agency costs, based on asset turnover ratio, have a perfect mediation effect on the positive association between the corporate governance index and firm performance, while there is a partial effect on the relationship between only board effectiveness sub-index and firm performance.

Regarding policy implications, the corporate governance index, developed by the researcher in the second core chapter, could help investors to assess the governance structure of UK insurance companies when making investment decisions. It could also be a helpful benchmarking tool for regulators and policy makers, as well as for insurance companies themselves (self-benchmark). On the other hand, this study has also important consequences for both shareholders and managers of firms who are concerned about performance, suggesting that both principals and agents should be keen to adopt good corporate governance practices in order to mitigate agency costs, which in turn, improve firm performance and thus, shareholder wealth as a result.

3.5.3 Research Limitations

This study experienced some issues that would limit the significance of the research findings. Firstly, since the sample included both listed and non-listed companies, of which performance for non-listed companies cannot be estimated using market-based measures, this study used only accounting-based measures as performance proxies. Secondly, with regard to agency costs measurement, since there is no direct way to measure the absolute value of agency costs, the relative agency costs for a specific firm were estimated, according to Ang, Cole and Lin (2000), by the difference in the asset turnover ratio between a firm and the firm with zero agency-cost, as suggested by Jensen and Meckling (1976). However, since there was no firm with 100 percentage owner-manager, implying a zero agency-cost, this study considered the firm with the maximum asset turnover ratio to be the reference point for comparison, or a zero agency-cost firm. Thirdly, it was found that the board accountability sub-index has a low coefficient alpha score (0.3850), while 0.70 is the acceptable value for new scales (Devellis, 2003), although still a reliable sub-index with a little concern about the internal consistency[39] in which its statements need to be revised and checked. Finally, this study has presumed that corporate governance affected firm performance, although reverse causality may occur in some cases, such as when a successful firm awards directors more shares. It is also argued that such profitable firms are more likely to have sufficient funds to afford the cost of disclosing more information for stakeholders, i.e. comply with the UK CG code (Hussainey and Al-Najjar, 2012). Therefore, the results should be interpreted as a partial correlation, rather than a causal relationship.

[39] Internal Consistency means how closely related a set of items are as a group when measuring the same issue (Litwin, 1995; Devon et al., 2007).

3.5.4 Further Research

Given the partial mediation results of the UKCGI sub-indices, the statements of current corporate governance index need to be revised and tested in order to eliminate any co-linearity and inconsistency issues that might violate estimations and regression results. Secondly, future research on corporate governance might be concerned with adding more statements covering other CG arrangements that have not been included in the current UKCGI, and might benefit from other indices and codes of practices around the world in order to make it an international CG benchmarking index, rather than a UK CG index only. Moreover, the interacting relationship between CG arrangements should be considered, as some governance practices are treated as complements, even if, in fact, they might be substitutes (Bozec and Bozec, 2012; Yoo and Jung, 2014), such as the negative impact of tenure and the positive impact of experience. Finally, rather than using individual various measures for firm performance, further studies might estimate firm efficiency scores as one representative measure of firm performance.

Chapter 4

The Choice of Distribution Strategy as a Complementary Corporate Governance System, Does it work?

Chapter 4: The Choice of Distribution Strategy as a Complementary Corporate Governance System, Does it work?

Abstract

Distribution is one of the key determinants of success for all insurance companies, and the choice of distribution channels can determine the success of an insurer and significantly affect its profitability in related markets. Applying the non-parametric data envelopment analysis (DEA), the aim of this study is to compare the efficiency of distribution strategies, whether single or multi-channel, that insurance companies have implemented in the UK during the period 2004-2013. It then examines the extent to which the choice of a specific distribution strategy, namely independent agents, improve firm efficiency, by reducing agency conflicts between policyholders and managers and shareholders, acting as a complementary corporate governance system in stock and mutual insurance companies. The main findings show that multi-channel insurers have higher scale efficiency compared to other single strategies, in which they have almost reached their optimal size to operate efficiently and utilise their strengths. In the second stage, the association between corporate governance, estimated by the newly built corporate governance index (UKCGI), and firm performance, measured by the DEA efficiency scores, has been fully confirmed in stock companies. On the other hand, the results also show that independent agency strategy does play a vital role as a complementary corporate governance system, with strong evidence for stock companies, but with weaker evidence for mutuals.

Keywords: Distribution Strategy, DEA Efficiency Scores, Corporate Governance, Stock Companies, Mutuals, Insurance, United Kingdom.

4.1 Introduction

Distribution is one of the key determinants of success for all insurance companies, and the choice of distribution channels, according to Klumpers (2004); Brockett *et al.* (2005), can determine the success of an insurer and significantly affect its profitability in related markets. In the UK, both company sales forces and exclusive agents dominated the distribution of insurance products until deregulation in 1986, since when their importance has been diminishing, to the benefit of independent agents as well as banks, building societies, retailers and global brands (Webb and Pettigrew, 1999). More recently, developments in information technology have significantly helped direct insurance sales, such as process computerisation and call centres, leading to more sales with less staff and associated costs (Webb and Pettigrew, 1999). However, although insurers using either independent agents or direct sales, including both sales force and distance selling, have dominated the UK insurance market since then, their market shares have remained small compared to multi-channel insurers who use more than one distribution channel [40] (Insurance Europe, 2014). On the other hand, regarding the emerging conflicts between insurers and both policyholders and agents, some insurance companies have implemented complementary governance systems in order to help reduce such agency conflicts that cannot be mitigated using the basic corporate governance system (Ward, 2003). Finally, in addition to its importance for the whole UK economy, as will be discussed later, the UK insurance industry has been selected in this study for several reasons, namely, extensive regulatory changes following deregulation of the UK financial services sector in the mid-1980s, increased competition from other financial, and even non-financial companies, and technological developments (Webb and Pettigrew, 1999; Klumpers, 2004).

Most previous studies have examined the effect of specific distribution channels on the performance of insurance companies, mainly using two channels: independent financial advisors (IFAs) and exclusive agents (see Berger, Cummins and Weiss, 1997; Klumpers, 2004; Trigo-Gamarra, 2008; Park, Lee and Kang, 2009). Few studies, however, have tried a more comprehensive approach by investigating the effectiveness of the combination of distribution channels used in a specific company on the performance of such a company (Easingwood and Coelho, 2003; Coelho and Easingwood, 2004; Trigo-Gamarra and Growitsch, 2008; Easingwood and Coelho, 2010; Trigo-Gamarra and Growitsch, 2010). For example, a study, by (Trigo-Gamarra and Growitsch, 2010) recognised three types of distribution strategies, a multi-channel strategy and two single-channel strategies, which are direct distribution without

[40] For the purpose of this study, the various methods of selling insurance to consumers and business firms are referred to as 'Distribution Strategies', which might be a single-channel or a multi-channel strategy. Each strategy may include one or more of the distribution channels discussed in this study, namely, sales force, exclusive agents, independent intermediaries, Bancassurance, retailers and affinity partnerships, distance selling, and aggregators (price comparison websites).

the use of salespersons, and independent intermediaries. Therefore, this study investigated the impact of all distribution strategies used among insurance companies in the UK. In particular, 36% of the sample insurers were using multi-channel strategy to sell insurance products, while other insurers preferred to use a single channel strategy, in which independent intermediaries had the highest market share among other channels (42.66%), while exclusive agents still comprised a considerable percentage among single-channel strategies in the UK insurance industry (10.82%). However, the least popular single-channel strategies were direct writing via distance selling (4%) and Bancassurance (3%) (see *Table 4-7* - Descriptive Statistics).

Moreover, most previous studies on the association between distribution strategies and firm performance have been implemented in the USA (Kim, Mayers and Smith, 1996; Park, Lee and Kang, 2009), with a few others in European companies, such as Germany (Trigo-Gamarra and Growitsch, 2008; Trigo-Gamarra and Growitsch, 2010), while fewer studies in the UK have focused on one insurance line only, either life or non-life (Webb and Pettigrew, 1999; Ward, 2003; Klumpers, 2004; Kumar, 2009). On the other hand, corporate governance is considered as a key factor to improve performance, thereby facilitating growth in insurance companies, as it promotes accountability, enhances transparency, improves profitability and, finally, protects stakeholders' interests (Babu and P.Viswanatham, 2013). In this regard, some studies have investigated the impact of corporate governance on firm efficiency, mainly in the USA (Huang, Hsiao and Lai, 2007; Huang *et al.*, 2011), with less in the UK (Hardwick, Adams and Zou, 2003). However, to the best of the researcher's knowledge, only two studies have examined the link between corporate governance, distribution strategies and firm performance, in which both studies have investigated the effect of independent intermediaries as a mode of corporate governance to help control the insurers' opportunistic behaviour against policyholders. The first study used 1981 data from the A. M. Best Company for 1,480 property-liability insurance companies in the USA (Kim, Mayers and Smith, 1996), while the second one used data for 42 life insurance companies over the period 1990-1997 in the UK (Ward, 2003). In this study, the built UK Corporate Governance Index (UKCGI)[41] was used rather than individual corporate governance arrangements. To sum up, the following research questions will be answered:

1. ***Does the choice of distribution strategy affect the efficiency of insurance firms?***
2. ***To what extent would the choice of distribution strategy improve corporate governance good practices, leading to enhanced efficiency?***

This chapter is organised as follows: section 2 firstly gives an overview of the UK insurance distribution, including the regulations that have affected the insurance market and how

[41] The establishment of the UKCGI has been thoroughly discussed in Chapter 3 – Section 3.3.2.III.

insurers sell insurance products, as well as the distribution channels deployed in the UK. Channel typology and distribution strategies are reviewed and the impact on firm performance is discussed. The final part of the literature review has focused on the impact of distribution on corporate governance and, thus, on firm performance. Section 3 describes the dataset, sampling process, and how variables were estimated, including a summary of the data envelopment analysis, which was used to estimate the efficiency score, as a proxy of firm performance, in order to test the first proposed hypothesis. It also explains the research design and methodology, and justifies the choice of panel data multiple regression to answer the research question. Section 4 shows the descriptive statistics related to the key variables, robustness checks, model specifications and, finally, discusses the results of the regression models in the light of proposed hypotheses. Finally, section 5 summarises the main research findings and contributions, identifies the research limitations and recommends some areas for future research.

4.2 Literature Review

This section firstly describes the UK insurance market, and reviews the regulatory changes and technological advances that led to the developments in the distribution channels. It then defines single and multi-channel strategies, and summarises the benefits and shortcomings associated with each strategy. Following this, the relationship between distribution strategy and corporate governance, and the impact on firm efficiency are discussed and, finally, the related hypotheses are derived.

4.2.1 Distribution in the UK Insurance Market

I. Overview of the UK Insurance Market

The UK Insurance market is the third largest in the world after the US and Japan, and the largest in Europe, with around a fifth of the total European gross written premiums, and around quarter of the total European benefits and claims paid (Kumar, 2009; ABI, 2012; ABI, 2013; ABI, 2014; Swiss Re, 2014; ABI, 2015; Insurance Europe, 2014). It is also an essential part of the UK economy, managing £1.9trn in investments during 2014[42] (£1.8trn in 2013), paying £11.8bn in taxes (£10bn in 2013), contributing around 12% to UK GDP in 2013, and employing around 334,000 individuals (315,000 in 2013), of which around a third are employed directly by insurers, with the remainder in auxiliary services (Insurance Europe, 2014; ABI, 2014; ABI, 2015). The market consists of companies, Lloyd's underwriters, brokers and intermediaries and their clients, in which companies might be publicly quoted, such as Aviva and RSA, privately owned by foreign insurance groups, such as AXA and Zurich, or by banks, such as Direct Line and Esure, or mutual, such as BUPA and NFU Mutual (Kumar, 2009). As at January 2014, there were 911 authorised general insurance[43] companies in the UK (349 UK authorised and 562 EU authorised[44]), and 387 authorised life insurance[45] companies (210 UK authorised and 177 EU authorised[46]) (Bank of England, 2014; ABI, 2014).

According to ABI (2014), the UK general insurance industry received worldwide net premiums of £50.2bn and paid out claims of £32.1 in 2013, while the UK life insurance industry received worldwide net premiums of £160.4bn and paid out benefits of £191.2bn in the same year (see

[42] Available from the latest version of the annual report: UK Insurance – Key Facts (2015), released by Association of British Insurers (ABI).

[43] General or non-life insurance includes motor, property, accident, health, liability, pet insurance and other specialist lines, which play an import role in UK society as well as helping business to cope with unforeseen events and to recover more effectively (ABI, 2014).

[44] Headquartered in another European country and passport in under the EU Third Non-Life Directive (ABI, 2014).

[45] Life insurance and long-term savings includes pensions, annuities, investments, savings and protection policies, which are used to provide an income during retirement and provide for individuals and their families following an accident, illness or a death in the family (ABI, 2014).

[46] Headquartered in another European country and passport in under the EU Third Life Directive (ABI, 2014).

also Insurance Europe, 2014 [Numbers in €m]). Finally, of the 26.7m households in the UK in 2013: 20.4m had contents insurance, 20.1m had motor insurance, 17m had buildings insurance, 1.9m had private medical insurance. For long term savings products, 5.7m had life assurance, 2.3m had a personal pension, 0.6m had term life assurance, and 0.3m had income protection (Bulman, Kubascikova-Mullen and Whiting, 2014; ABI, 2015).

II. Regulatory Changes in the UK Insurance Market

In the UK, changes in distribution channels are mainly driven by regulatory and technological developments, and the emergence of new competitors, as well as changes in consumer demand and preferences (Webb and Pettigrew, 1999; Klumpers, 2004; Insurance Europe, 2014). Regarding regulatory changes, the insurance industry had operated in a passive environment until the 1980s, affected by a set of regulations that has efficiently protected insurance companies from competition (Webb and Pettigrew, 1999). Latterly, the Financial Services and Building Societies Acts of 1986 have deregulated, i.e. re-regulated, the financial services industry in the UK (Pettigrew and Whipp, 1991). Those two pieces of legislation, according to Webb and Pettigrew (1999), removed many of the barriers to entry for non-U.K. companies and nonfinancial services firms, as well as allowing existing financial services firms to expand into parallel sectors. By 1996, banks and building societies, global brands and multiple chain food retailers had entered the general and long-term insurance market, resulting in growing competitiveness with traditional insurers, i.e. sales force and exclusive agents (Webb and Pettigrew, 1999). Moreover, information technology has also played a significant role in the insurance industry serving direct insurance sales in particular, such as the establishment of call centres and the computerisation of claims handling and policy servicing, leading to improved customer service, less staff required and, thus, reduced operating costs (Webb and Pettigrew, 1999). However, in recent years a number of companies have been charged with the 'miss-selling' of personal pensions, which has led to reduced consumer trust in traditional pension providers, and increased demand for alternative products and suppliers as a result (Webb and Pettigrew, 1999; Klumpers, 2004).

The Financial Services and Markets Act 2000 (FSMA) completed the formal process to replace the eight financial services regulators which existed before 1997, through the Department for Trade and Industry (DTI) to the HM Treasury in preparation for the move to the Financial Services Authority (FSA) in 2001 (Ford, 2012). The FSA regulation involved both prudential requirements and controls over conduct of businesses, with financial stability being added later by the Financial Services Act 2010, rather than public awareness, as a key objective of the revised regulatory regime post-2009 financial crisis (The Investment Association, 2012; Ford, 2012; Rawlings, Georgosouli and Russo, 2014). Thereafter, the UK government announced the

planned break-up of the FSA by the Financial Services Act 2012, whereby the prudential supervision of banks and insurers has been transferred to the Prudential Regulatory Authority (PRA), a new subsidiary of the Bank of England, while the FSA has been re-named as the Financial Conduct Authority (FCA), introducing more intrusive supervision (Ford, 2012; The Investment Association, 2012; Rawlings, Georgosouli and Russo, 2014).

On the other hand, as a member of the European Union, the UK is also subject to the directives issued by the European Parliament. In this regard, the Third Generation of Life (92/96/EEC) and Non-Life (92/49/EEC) Insurance Directives established the 'single market' for insurance in the mid-1990s (Hardwick and Guirguis, 2007). Under this 'single passport' system, insurers authorised by prudential authorities in any member state are allowed to sell insurance throughout the EU, either online, or by establishing a branch or a subsidiary (Hardwick and Guirguis, 2007).

Recently, new regulations, such as the Retail Distribution Review (RDR) and the Gender Directive (Horn, 2014), which took effect from the first of January 2013, have also also affected insurance companies. For example, RDR has banned commission on investment products which negatively affects the Bancassurance channel, regardless of having met other training and experience requirements, while pricing has to be gender neutral, according to the Gender Directive, for all European insurance markets, which affects life and car insurance in particular (Horn, 2014). Finally, initiatives at the European level, such as the recently adopted Packaged Retail and Insurance-based Investment Products Regulation, could also have an impact on existing distribution structures (Insurance Europe, 2014).

III. Distribution in the UK Insurance Market

Insurance companies have used various distribution channels to sell their insurance products, with an increasing number of insurers utilizing a combination of different distribution channels to distribute their products efficiently (Easingwood and Coelho, 2003; Trigo-Gamarra and Growitsch, 2008; Trigo-Gamarra and Growitsch, 2010). According to O'shaughnessy (1995, p639); O'shaughnessy (2014), a distribution channel can be defined as "the network of people, institutions or agencies involved in the flow of a product to the customer, together with the informational, financial, promotional and other services associated with making the product convenient and attractive to buy and rebuy". Based on this definition, seven distribution channels are proposed, as follows: sales force, exclusive agents, independent intermediaries, Bancassurance, retailers and affinity partnerships, direct writing via distance selling, and aggregators.

Firstly, the sales agent is an employee of the insurance firm (Zweifel and Ghermi, 1990; Kim, Mayers and Smith, 1996; Easingwood and Coelho, 2003). Exclusive agents, on the other hand, are intermediaries acting as an agent of only one insurer (tied agents), but they are not technically the firm's employees (Zweifel and Ghermi, 1990; Barrese, Doerpinghaus and Nelson, 1995; Kim, Mayers and Smith, 1996; Berger, Cummins and Weiss, 1997; Park, Lee and Kang, 2009; Trigo-Gamarra and Growitsch, 2010; Insurance Europe, 2014).

Intermediaries include both multi-tied agents, who represent and sell the insurance products of several insurers, and brokers, who represent the interest of the insured, or customer, and sell the insurance products of many insurers (Zweifel and Ghermi, 1990; Barrese, Doerpinghaus and Nelson, 1995; Easingwood and Storey, 1996; Kim, Mayers and Smith, 1996; Berger, Cummins and Weiss, 1997; Park, Lee and Kang, 2009; Trigo-Gamarra and Growitsch, 2010; Insurance Europe, 2014; Kumar, 2009).

Bancassurance represents the fourth channel, in which insurance products are sold through the bank branch network using its wide customer base to price risk effectively, and benefit from enormous economies of scale (Easingwood and Storey, 1996; Kumar, 2009; Trigo-Gamarra and Growitsch, 2010; Chang, Peng and Fan, 2011; Horn, 2014; Insurance Europe, 2014). Some of the main bancassurers in the UK include Halifax, Lloyds Bank, and the Royal Bank of Scotland.

In the fifth distribution channel, insurers sell their products through other intermediaries, such as retailers, for example, Sainsbury's and the Post Office, or has affinity partnerships with car sellers, estate agents, travel agencies, etc. (Kumar, 2009; Insurance Europe, 2014).

The sixth distribution channel is direct writing, in which insurance products are distributed by insurers, without intermediaries, through distance selling using call centres, websites, mail, etc. (Barrese, Doerpinghaus and Nelson, 1995; Kim, Mayers and Smith, 1996; Easingwood and Storey, 1996; Park, Lee and Kang, 2009; Trigo-Gamarra and Growitsch, 2010; Insurance Europe, 2014). Regarding distance selling, the internet has become the main direct distribution channel, but insurance products may also be sold via telephone, television or mail (Trigo-Gamarra, 2007).

Finally, aggregators, or price comparison websites, which have grown substantially in recent years, taking a large share of the online market, due to the ability of their customers to compare insurance products from different brands according to their requirements and the offered prices as well (Kumar, 2009; Horn, 2014). Examples of well-known aggregators include CompareTheMarket.com, GoCompare.com, and MoneySupermarket.com.

In the UK, however, insurers are not obliged to disclose their distribution structure in detail, which means that information about the contribution of each single distribution channel to the total insurance business is not available although the Association of British Insurers (ABI) publishes annually aggregated statistics about how UK consumers purchase non-life insurance

[2004-2014][47] (see ABI, 2012; ABI, 2013; ABI, 2014; ABI, 2015), while the information about life distribution channels [2004-2012] has been extracted from the Insurance Europe Report (Insurance Europe, 2014). With regard to the type of distribution channel, it can be seen from *Table 4-1*, below, that independent intermediaries continued to be the main distribution channel for non-life insurance market in 2013 (37%), followed by direct distribution without the use of salespersons[48], including aggregators (35%), Bancassurance (12%), retailers and affinity partnerships (10%) and only 4% for company agents (ABI, 2014). However, *Table 4-1*, shows that intermediaries experienced a drop in market share from 55% in 2005, mainly at the expense of a jump in direct writing from 22% to becoming the second largest distribution channel in 2013. This was due to technological developments, such as the internet, mobile, social media, and aggregators (Kumar, 2009; Goh, 2012; Insurance Europe, 2014). The importance of banks doubled, although it still remained a small percentage, from 7% in 2005 to 12% in 2013, while retailers and other affinity groups increased a little from 8% to only 10% (*Table 4-1*). Moreover, detailed numbers about the life distribution channels, as illustrated in *Table 4-1*, show that intermediaries, including brokers, tied and multi-tied agents, were the most popular channel during the period 2004-2012, although their market share experienced a drop from around 95% in 2009 to 83% in 2012 (*Table 4-1*). Direct writing by company staff and distance selling, on the other hand, multiplied more than three times, from around 5% to up to 17% in 2012 (*Table 4-1*).

Table 4-1: Distribution Channels in the UK for Non-Life and Life Insurance Products

Item	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Non-Life Distribution Channels*											
Company Agents	6.00 %	5.00 %	5.00 %	7.00 %	6.00 %	6.00 %	7.00 %	5.00 %	5.00 %	5.00 %	5.00 %
Direct (Distance Selling, including Price Comparison Websites)	20.00 %	21.00 %	21.00 %	22.00 %	22.00 %	23.00 %	23.00 %	26.00 %	25.00 %	25.00 %	25.00 %
Independent Intermediaries (Tied & Multi-Tied Agents + Brokers)	54.00 %	54.00 %	54.00 %	54.00 %	56.00 %	57.00 %	57.00 %	56.00 %	55.00 %	54.00 %	54.00 %
Bancassurance	9.00 %	10.00 %	10.00 %	9.00 %	10.00 %	7.00 %	7.00 %	8.00 %	7.00 %	7.00 %	7.00 %
Utilities/Retailers/ Affinity Groups	9.00 %	8.00 %	8.00 %	7.00 %	5.00 %	5.00 %	6.00 %	5.00 %	7.00 %	7.00 %	7.00 %
Others	2.00 %	2.00 %	2.00 %	1.00 %	1.00 %	2.00 %	0.00 %	0.00 %	1.00 %	2.00 %	2.00 %

[47] In addition to what level of advice is given with the purchase of each type of life insurance [2009-2013].

[48] It is important to distinguish direct distribution from the broader concept of direct marketing, as the latter term describes "any communication (advertising or direct mail) that invites the potential customer to communicate directly (via mail or telephone) with the company" (Easingwood and Storey, 1996), whereas direct distribution means that the policies must also be sold without the use of any salesperson.

Item	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Life Distribution Channels**											
Direct Writing (Staff + Distance Selling)	**7.54 %**	**5.37 %**	**4.39 %**	**4.08 %**	**3.45 %**	**5.38 %**	**7.87 %**	**12.80 %**	**16.90 %**	**N/A**	**N/A**
Intermediaries	**92.46 %**	**94.63 %**	**95.61 %**	**95.92 %**	**96.55 %**	**94.62 %**	**92.13 %**	**87.20 %**	**83.10 %**	**N/A**	**N/A**
Intermediaries: Agents (Tied + Multi-Tied)	23.62 %	21.31 %	20.30 %	19.78 %	18.52 %	23.46 %	13.94 %	18.50 %	22.80 %	**N/A**	**N/A**
Intermediaries: Brokers	68.84 %	73.32 %	75.31 %	76.14 %	78.03 %	71.16 %	78.19 %	68.70 %	60.30 %	**N/A**	**N/A**
Intermediaries: Others (Utilities/Retailers/ Affinity Groups)	0.00 %	0.00 %	0.01 %	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	**N/A**	**N/A**
Bancassurance	**0.00 %**	**0.00 %**	**0.00 %**	**0.00 %**	**0.00 %**	**0.00 %**	**0.00 %**	**0.00 %**	**0.00 %**	**N/A**	**N/A**
Others	**0.00 %**	**0.00 %**	**0.00 %**	**0.00 %**	**0.00 %**	**0.00 %**	**0.00 %**	**0.00 %**	**0.00 %**	**N/A**	**N/A**

***Source:** Extracted and Compiled from the annual key facts reports of the Association of the British Insurers (ABI) 2005-2015*
****Source:** Extracted and Compiled from the Insurance Europe Report (Insurance Europe in Figures – N°50) 2004-2013*

With regard to the advice given, ABI (2014) claimed that consumers were more likely to purchase non-life insurance products directly due to the relative simplicity of such products, while the long-term insurance products, as a result of their complexity, were mostly bought with advice. In 2013, for example, over half of motor insurance (52%) and a fifth of domestic insurance (22%) was purchased directly by consumers, including sales via aggregators (price comparison websites) (ABI, 2014). In contrast, 70% of customers who purchased pension, protection or other long-term insurance products had had some kind of advice, ABI (2014) identified that advice was taken by 87% of consumers when selecting a pension product, and by only 45% for protection products. On the other hand, over the last 10 years, independent financial advisors (IFAs) remained the predominate life insurance distributor, with around 63% market share in 2013 and a peak value of 78% in 2011 (*Table 4-2*, below). However, according to *Table 4-1*, insurers who offered restricted advice suffered a 20% decline in their market share between 2005 and 2013 to the benefit of purchasing life insurance without advice, which has reached 30% in 2013 (*Table 4-2*).

Table 4-2: UK Life Insurance by the Level of Advice Given

Item	2009	2010	2011	2012	2013
IFAs/WoM[49]	68.00%	76.00%	78.00%	76.00%	63.00%
Non-Intermediaries (Non-Advised)	6.00%	11.00%	13.00%	17.00%	30.00%
Single Tied (Restricted Advice - from 2013)	26.00%	13.00%	9.00%	7.00%	7.00%

***Source:** Extracted and Compiled from the annual key facts reports of the Association of the British Insurers (ABI) 2010-2015*

[49] Independent Financial Advisors or Whole of Market Providers

Finally, the components of distribution strategy used by each company were extracted from the annual financial statements and/or company website for the period 2004-2013, as individual contributions of distribution channels are not disclosed, but only the aggregated premium income for life and/or non-life insurance. Therefore, this study investigated the impact of using different combinations of distribution channels, referred to as 'distribution strategy', which might include one or more distribution channels, on the efficiency of UK insurance companies. Thereafter, the association between corporate governance and firm efficiency has been explored, and the extent to which this relationship is affected by the choice of distribution strategy has been investigated.

IV. Towards Distribution Strategies

Prior to examining the impact of distribution strategies, whether single or multiple, it was first necessary to look at what differentiates one distribution channel from another, i.e. channel typology, and to suggest the most appropriate one. Different channel typologies have been proposed in the previous literature, in which some authors have investigated the most popular channels only, such as (Trigo-Gamarra, 2007; Trigo-Gamarra and Growitsch, 2010), who focused on direct writing insurers, independent agency insurers, and multi-channel strategy, which included insurers who used more than one channel. Many other studies have explored the difference between exclusive agents and independent agents (Zweifel and Ghermi, 1990; Barrese and Nelson, 1992; Kim, Mayers and Smith, 1996; Trigo-Gamarra, 2008; Park, Lee and Kang, 2009). On the other hand, (Easingwood and Coelho, 2003) suggested three different channels: traditional direct (sales force and bank networks), direct marketing (direct response advertising and direct mail), and intermediaries (independent agents and brokers), whereas branch networks and sales force, also direct response advertising and direct mail, had been treated as separated channels in previous work (Easingwood and Storey, 1996). For the purpose of this study, the criteria suggested by (Easingwood and Coelho, 2003) were followed and, thus, distribution channels were distinguished by the degree of contact and control offered, as per the following figure (*Figure 4-1*), which includes the different distribution channels in the UK insurance market.

No.	Distribution Channel	Control*	Contact**	Policy Renewal***
1	Sales Force	High	High	Insurer
2	Exclusive Agents	High	High	Insurer
3	Intermediaries (Independent Agents & Brokers)	Low	Low (Insurer) High (Agent)	Independent Agents(Agent) Brokers (Insurer)
4	Bancassurance	High	Low (Insurer) High (Agent)	Insurer
5	Retailers & Affinity Partnerships	High	Low (Insurer) High (Agent)	Insurer

No.	Distribution Channel	Control*	Contact**	Policy Renewal***
6	Distance Selling	High	Low	Insurer
7	Aggregators	Low	Low	Insurer

Figure 4-1: Distribution Channels in the UK Insurance Market
**Control: High (Dependent), Low (Independent), **Contact: High (Face-to-Fact), Low (Online - Distance Selling), ***Policy Renewal: by Insurer or by Agent.*

Based on the proposed channel typology, channels that had similar contact and control characteristics were treated as single channels, such as sales force and exclusive agents, Bancassurance, retailers and affinity partnerships, which resulted in five distribution channels that were fundamentally different in terms of contact and control, and one multi-channel strategy, as follows (*Figure 4-2*):

No.	Distribution Strategy	Control	Contact
1	Exclusive Agents & Sales Force	High	High
2	Intermediaries	Low	Low (Insurer) High (Channel)
3	Bancassurance, Retailers & Affinity Partnerships	High	Low (Insurer) High (Channel)
4	Distance Selling	High	Low
5	Aggregators	Low	Low
6	Multi-Channel Strategy	-	-

Figure 4-2: Distribution Strategies in the UK Insurance Market
*Control: High (Dependent), Low (Independent), **Contact: High (Face-to-Fact), Low (Contactless)

Having established the channel typology, it is now necessary to select the most appropriate rule to declare whether a single or multi-channel strategy is being used in a specific company. In the research so far, three alternative rules have been used in this regard; a 0 per cent cut-off classification rule, a larger than 0 per cent cut-off and, finally, grouping companies with similar mixes of channels, i.e. cluster analysis (Easingwood and Coelho, 2003). According to the first alternative, companies that obtain any percentage of premiums from two different channels at least are considered to be multi-channels providers, whereas those getting 100 per cent premiums from a single channel are classified as single-channel providers[50] (Dutta *et al.*, 1995; Klein, Frazier and Roth, 1990; Easingwood and Coelho, 2003; Trigo-Gamarra, 2007). In the second alternative, a percentage larger than 0 per cent would be selected as a cut-off classification rule, e.g. 15 per cent, in which companies need to obtain at least 15 per cent each from a minimum of two different channels in order to be classified as multi-channel providers

[50] "Although it is a strict definition of the distinction between a single and a multi-channel strategy", it may be argued that "the 0 per cent cut-off rule will yield an over-inflated multi-channel group" (Easingwood and Coelho, 2003). For example, "a company selling a tiny share through a second channel would be classified as multi-channel exactly the same as a company selling, say, 25 per cent share through a second channel" (Easingwood and Coelho, 2003).

(John and Weitz, 1988; Easingwood and Coelho, 2003). Finally, two different cut-off rules, 0 per cent and 15 per cent, would be included to define three types of single/multi-channel alternatives. A pure single channel strategy comprising companies whose premiums are obtained entirely from a single channel, an evolving multi-channel strategy with companies whose premiums from a second channel is between 0 and 15 percent, and an established multi-channel strategy comprising companies whose premiums from two different channels exceed 15 percent each (Easingwood and Coelho, 2003). However, although it can be argued that there is no one-fit-all channel classification rule[51], the most appropriate criteria should depend on the purpose of the research (Easingwood and Coelho, 2003). Thus, a 0 per cent cut-off classification rule was adopted in this study, since no detailed statistics on the individual contribution for each channel were available for the UK insurance companies.

Finally, the benefits and shortcomings of the different distribution strategies are discussed below, and the respective hypotheses are derived thereafter.

Sales Force & Exclusive Agents

In addition to sales force, insurance products used to be sold by exclusive agents, who were essentially product salespersons 'tied' to an product manufacturer (Goh, 2012). Both sales force and exclusive agents were considered in the research as a single channel, since they both involve face-to-face contact with the customer, and are tied to the insurer, either salary-based (company agents), or commission-based (tied agents). Having established this channel, insurers enjoy several advantages according to (Easingwood and Coelho, 2003), such as scale and scope economies, improved communication and co-ordination of activities, and more complicated products being delivered, due to high levels of personal contact with consumers. However, such channels require large investments, and might suffer lack of strategic flexibility if customer preferences change (Easingwood and Coelho, 2003).

Intermediaries (Independent Agents & Brokers)

This strategy means that insurers use only independent intermediaries to sell insurance products, including brokers and multi-tied agents. Intermediaries used to be, and still are, the dominant sales channel in the UK (Kumar, 2009; ABI, 2012; ABI, 2013; ABI, 2014; ABI, 2015; Insurance Europe, 2014; Insurance Europe, 2016). Insurers who rely on intermediaries as a single strategy gain wide market access without the need for large investments, benefit from the accumulated experience of the intermediaries, have high flexibility against environmental change and customer volatility, but their lack of ownership results in losing the benefits of

[51] See (Easingwood and Coelho, 2003) for advantages and disadvantages of each classification rule (pp35-38).

integration (Easingwood and Coelho, 2003). However, although lower fixed costs incur when using intermediaries, variable costs, mainly commissions, are higher than other distribution channels, such as exclusive agents, banks or direct writing (Zweifel and Ghermi, 1990; Easingwood and Coelho, 2003; Dahmen, 2004; Trigo-Gamarra, 2007). These high costs are usually justified by a higher level of service quality (Joskow, 1973; Cummins and Vanderhei, 1979; Barrese and Nelson, 1992; Berger, Cummins and Weiss, 1997; Klumpers, 2004; Brockett *et al.*, 2005), which enable insurers to reduce transaction costs, and develop more profitable business, such as complex and counselling-intensive insurance products, leading to higher revenues (Berger, Cummins and Weiss, 1997; Anderson, Ross and Weitz, 1998; Trigo-Gamarra, 2007). On the other hand, customers also benefit from reduced search costs (Poseya and Tennyson, 1998), a better market overview for the customer, and a better monitoring of the insurer by independent agents (Mayers and Smith, 1981; Kim, Mayers and Smith, 1996; Regan, 1997; Ward, 2003).

Bancassurance, Retailers and Affinity Partnerships

Similar to company agents, banks have a regulated sales force to sell insurance products to their consumer base (Easingwood and Coelho, 2003). On the other hand, an affinity group is a group of individuals who share the same interests, or belong to the same company and, thus, affinity members might be fans, subscribers, or even customers of a range of retailers, for example, such as Asda, Tesco, Sainsbury's, and the Post Office (Kumar, 2009). As with sales force and exclusive agents, this channel allows insurers to bring enormous economies of scale, and extensive personal contact with consumers, but involves lower levels of flexibility against unexpected changes in consumers preferences, for example (Easingwood and Coelho, 2003; Kumar, 2009). Finally, (Chang, Peng and Fan, 2011) argued that the benefits for insurers selling their insurance products through banks' channel have not been explored adequately, although such benefits have been confirmed from the banks' perspective.

Direct Writing via Distance Selling

Due to technological advances, insurers are increasingly using direct channel (e.g. company websites, direct response advertising, direct mail and direct telesales) as a complement to the traditional channels (sales force, exclusive agents and intermediaries), usually for standardised or low involvement products, such as household, motor, personal accident and travel (Easingwood and Coelho, 2003; Kumar, 2009; Goh, 2012). Direct insurers are able to provide insurance at lower costs compared to other channels due to lack of commission costs for insurance agents and, thus, attract customers by offering lower premiums (Easingwood and Coelho, 2003; Trigo-Gamarra, 2007). However, when establishing this channel insurers incur large fixed costs, due to higher investments, such as computer systems, call centres, and financial capital (Cummins and Rubio-Misas, 2006), and high marketing costs thereafter, for

customer acquisition and the creation of a well-known brand (Ennew and Waite, 2007). It is also too difficult for direct insurers to sell complex and counselling-intensive products, such as life and investment products, due to the personal advice and face-to-face contact needed for such products (Easingwood and Coelho, 2003; Trigo-Gamarra, 2007). Finally, direct writing is facing pressure from aggregators, which aim to satisfy consumer desire for transparency with respect to price (Kumar, 2009).

Aggregators (Price Comparison Websites)

According to (Kumar, 2009; Insurance Europe, 2014), the widespread use of the internet has led to the increasing popularity of aggregators, or price comparison websites, such as confused.com, comparethemarket.com, etc., that sell insurance without the use of salespersons, or any face-to-face contact with customers, similar to direct writing via distance selling. Price is the key driver of online quotes, meaning that new entrants, either insurers, brokers or even affinities, can enter the markets through aggregators, and operate at a lower cost (Kumar, 2009). However, as in the case of direct writing, only standardised or low involvement products, such as household, motor, personal accident and travel, can be sold through aggregators (Easingwood and Coelho, 2003; Kumar, 2009; Goh, 2012). Moreover, as brokers can also sell through the aggregator's websites, a specific product could be quoted multiple times at different prices on a single quote (Kumar, 2009). Finally, consumers often search aggregators' websites only to view insurance providers and compare prices, while they prefer to purchase directly from the insurer's direct channels (Kumar, 2009).

Multi-Channel Strategy

There are a number of possible explanations about why companies sometimes employ more than one channel, but they can be classified within two main aspects: '*scope economies*' and '*volatility in consumers' needs*' (Klein, Frazier and Roth, 1990; Cummins and Weiss, 1998; Easingwood and Coelho, 2003; Cummins and Weiss, 2012). Scope economies can be defined, according to (Dutta *et al.*, 1995), as the extent to which an insurer can spread distribution costs over the sales of its product lines. Thus, companies with many product lines would benefit from multi-channel strategies, and reach extended coverage of the market, as they find it easier to overcome the high investment costs required to establish additional distribution channels, such as call centres or direct mail departments, or which are due to high coordination costs which might arise between the channels (Easingwood and Storey, 1996; Webb, 2002; Easingwood and Coelho, 2003; Trigo-Gamarra, 2007). On the other hand, consumers' volatility is the amount of uncertainty about the changes in the needs and preferences of consumers (Klein, Frazier and Roth, 1990; Easingwood and Coelho, 2003). With this regard, the use of a multi-channel strategy might help existing customers to meet their needs by offering alternative channels to choose from (Tsay and Agrawal, 2004; Trigo-Gamarra, 2007; Coelho

and Easingwood, 2007). Moreover, information about customers can be shared by different channels (Easingwood and Coelho, 2003; Coelho and Easingwood, 2007), which makes it easier for a multi-channel insurer to target different customer segments, or even to reach new ones (Trigo-Gamarra, 2007; Coelho and Easingwood, 2007). Finally, a multi-channel strategy would help the insurer in the case of rising competition, to prevent the loss of market shares to new entrants with low price strategies, unlike single-channel strategies (Trigo-Gamarra, 2007). However, as discussed above with the case of aggregators, a multi-channel insurer might face the risk of channel cannibalization effects[52], in which customers might be redirected between the different channels, or use the new channels to obtain more information about insurance products which would then be purchased using the established channels (Dzienziol *et al.*, 2002; Trigo-Gamarra, 2007)

4.2.2 The Choice of Distribution and Performance

As has been shown, the UK insurance market is characterized by an increasing number of different products as a result of the liberalisation of the industry in the mid-1980s, the changes in customers' needs and technological developments (Webb and Pettigrew, 1999; Easingwood and Coelho, 2003; Klumpers, 2004; Kumar, 2009; Goh, 2012; Insurance Europe, 2014). On the other hand, insurers are increasingly relying on multi-channels strategies to reach an extended coverage of the market and make their products available to more customers (Coelho and Easingwood, 2004; Insurance Europe, 2014; Kumar, 2009; Easingwood and Coelho, 2003). However, although various empirical studies have previously investigated the impact of different distribution strategies on firm performance, most of these studies only compared exclusive agents against independent agents, as the most popular distribution strategies in the insurance industry (Zweifel and Ghermi, 1990; Barrese and Nelson, 1992; Kim, Mayers and Smith, 1996; Berger, Cummins and Weiss, 1997; Klumpers, 2004; Trigo-Gamarra, 2008; Park, Lee and Kang, 2009). One exception is the study by (Chang, Peng and Fan, 2011), which compared Bancassurance and traditional channel (company agents) in Taiwan, and found that traditional channels were significantly more efficient than the Bancassurance channel.

Many previous studies, (Joskow, 1973; Cummins and Vanderhei, 1979; Barrese and Nelson, 1992) have confirmed that independent agents incur much higher costs, although these are associated with higher service quality, than other distribution strategies, especially exclusive agents, in which the latter have been found to be more cost efficient if revenues are not taken into account (Berger, Cummins and Weiss, 1997). On the other hand, (Cummins, 1999) argued

[52] "Instead of increasing turnover and profits, the establishment of additional channels only redirects turnover from one channel to another" (Dzienziol et al., 2002).

that direct insurers have lower cost and revenue efficiencies, but higher technical efficiency than agent-based insurers, similar to (Brockett *et al.*, 2005), who found independent agency insurers to be more efficient than direct insurers, including exclusive agents, in a sample of US property-liability insurance firms. In contrast, (Klumpers, 2004) found that independent agency insurers were less efficient in terms of both cost and profit, compared to dependent agency insurers in a sample of UK life insurance firms.

Finally, as far as the researcher was aware, only one study had compared the efficiency of single- and multi- channel distribution strategies (Trigo-Gamarra, 2007; Trigo-Gamarra and Growitsch, 2010). In a sample of German life insurers, the authors compared the performance of the multi-channel strategy with each of two different single-channel strategies, direct writing and exclusive agents, and found that the multi-channel approach was superior to the specialised distribution strategies in the German life insurance industry (Trigo-Gamarra and Growitsch, 2010). The aim of the current study was, therefore, to compare the efficiency of single- and multi-channel strategies in the UK insurance industry, both stock and mutual, selling life, non-life or both products and, thus, based on the previous discussion, two hypotheses were derived:

H_1: Multi-channel insurers show a higher level of efficiency compared to single-channel Insurers.

H_2: Compared to other single-channel strategies, sales force and exclusive agents' insurers show the highest level of efficiency.

4.2.3 Corporate Governance, Distribution Strategy and Performance

In the following section, in order to examine the impact of a specific distribution strategy on the association between corporate governance and firm performance in the UK insurance market, based on the company's organisational form, two modes of corporate governance are first reviewed, followed by the agency conflicts related to each mode. Then, complementary governance systems are defined with their applications within insurance companies. Finally, the use of independent distribution as a complementary governance system is discussed, and a related hypothesis is derived.

Regarding the theoretical framework, there are many different theories to explain corporate governance, such as Agency Theory, Resource Dependency Theory, Stakeholder Theory, Transaction Cost Theory, Stewardship Theory, as well as less popular theories that have been developed later, such as Class Hegemony Theory, Managerial Hegemony Theory, Institutional

Theory, Political Theory and Network Governance Theory (see Mallin, 2012). However, the agency approach has been the most popular theory among other theories, as it has offered the basis for governance standards, codes and principles developed by many financial authorities around the world (Yusoff and Alhaji, 2012), while other theories are intended as complements to agency theory, rather than substitutes (Daily, Dalton and Cannella, 2003, p.375). Therefore, the proposed hypotheses have been based on the agency theory only as the main theory for the purpose of this study.

Agency theory has been first introduced by Alchian and Demsetz (1972), and then developed by Jensen and Meckling (1976), and it consists on the separation of ownership and control. In this theory, principals, shareholders or owners of the company, hires the agents, executives and management team, to operate the company in the principals' best interests, and thus, protect the ownership rights of shareholders. However, this theory suggests also that managers can be self-interested, and they might make decisions against the principals' interests (Clark, 2004; Davis, Schoorman and Donaldson, 1997; Jensen and Meckling, 1976; Ross, 1973; Padilla, 2002) (Abdullah and Valentine, 2009). Indeed, agency theory can be used to investigate the relationship between the ownership and management structure. However, in the case where there is a separation, this theory can be applied to align the objectives of the management team with those of the owners (Abdullah and Valentine, 2009). In this regard, corporate governance can be seen as a mechanism where a board of directors is a vital monitoring tool to minimize the principal-agent problems, which leads to reduce the agency costs, and maximise the firm's value (Deegan, 2004; Mallin, 2004). The deviation in the objectives of corporate principals and agents, Diacon and O'sullivan (1995) and Dharwadkar, George and Brandes (2000) argue, results from weak governance as well as the inability of minority shareholders to monitor and control managers' activities.

UK insurance companies are organized on either a stock, or mutual, basis. Stock companies, both publicly quoted and privately owned, are owned by their shareholders and, therefore, strive to maximize shareholder value, while mutual companies[53] are owned entirely by their policyholders[54], rather than shareholders, and so are not exposed to the market for corporate control (see Diacon and O'sullivan, 1995; Ward, 2003; NAIC, 2015; O'sullivan and Diacon, 2003). As stated before, insurance companies have been increasingly providing insurance ranging from simple to more complex products since deregulation in the mid-1980s (Webb and Pettigrew, 1999), and so managerial discretion needs to be high in order for managers to

[53] Includes mutual insurance companies, cooperative insurance companies, friendly societies, not-for-profit insurers, discretionary mutuals, and also limited companies majority-owned by mutual, cooperative, charitable or non-profit organisations.
[54] Any profits earned are returned to policyholders in the form of dividend distributions or reduced future premiums (NAIC, 2015).

monitor and exploit any profitable opportunity which might arise (Ward, 2003). Regarding the mode of corporate governance, insurance companies face two different agency problems, according to (Ward, 2003): shareholders who have to monitor and control managers for opportunistic behaviour, and policyholders who have to prevent exploitation by shareholders. According to (Mayers and Smith, 1981; O'sullivan and Diacon, 2003), stock companies are better at mitigating shareholder-manager agency conflicts, while agency problems between shareholders and policyholders are best solved by mutual companies.

Figure 4-3, below, presents a simplified framework of the agency relationships within the two modes of governance. In stock companies, according to (Ward, 2003), shareholders as principals employ managers as agents to act in their interests and maximise their wealth, while policyholders as principals employ insurance companies, i.e. managers, as agents to manage their risks and provide them with financial intermediary services. In this regard, managers have competing agency relationships with both shareholders and policyholders, which leads to another agency problem between large shareholders and widespread policyholders, when shareholders direct financial flows (dividends) towards themselves and away from policyholders (reserves). On the other hand, in mutual companies, policyholders are the principals who employ managers as agents to act in their interests and there are no shareholders to compete with. However, compared to large shareholders in stock companies, dispersed policyholders are unable to efficiently monitor and control their managers' opportunistic behaviour in the case of mutuals, especially with the increasing need for managerial discretion after mutuals have become able to underwrite more complex products, due to less prudential regulation following the financial deregulation since the 1980s (Webb and Pettigrew, 1999; Ward, 2003).

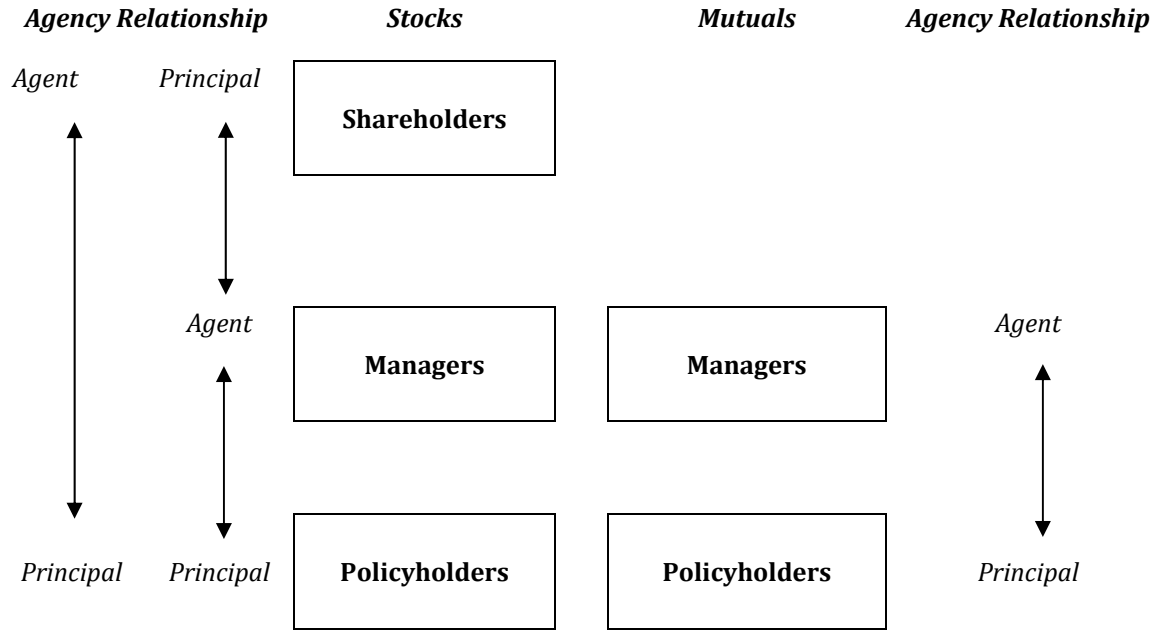

Figure 4-3: Agency Relationship in the UK Insurance
Source: (Ward, 2003)

As a result, insurance companies will introduce complementary governance systems if there is a net reduction in the overall agency costs[55]: shareholders-managers and shareholders-policyholders (Ward, 2003). As defined by (Milgrom and Roberts, 1995), two activities are considered to be strategic complements if doing more of one activity increases the marginal profitability of the other activity[56]. (Mayers and Smith, 1981) were the first to suggest the use of participating policies to reduce agency costs associated with the shareholder-policyholder conflicts in stock insurance firms. However, (Krishnaswami and Pottier, 2002) argued that a stock company would benefit from 'participating policies'[57] as a complementary governance system, but that would reduce the incentive to align the interests of shareholders and managers and, thus, suggested that using participating policies would be more likely in firms where shareholder-policyholder incentive conflict was more costly than shareholder-manager incentive conflict[58]. Therefore, there is a need for another alternative to be implemented in both stock and mutual companies as a complementary corporate governance system. (Kim, Mayers and Smith, 1996) suggested the use of a distribution strategy as a complementary governance system, which the current study has also applied, based on the broad definition of complementariness by (Milgrom and Roberts, 1995). Indeed, if choosing a specific distribution strategy changes the payoffs, so that firm efficiency rises when using a specific corporate governance structure, then corporate governance and distribution strategies are strategic complements.

As discussed above, distribution channels have increased, and insurers have increasingly used different distribution strategies since deregulation in the 1980s, technological advances and customer volatility (Webb and Pettigrew, 1999; Easingwood and Coelho, 2003; Klumpers, 2004; Kumar, 2009; Goh, 2012; Insurance Europe, 2014). On the other hand, insurance is either sold by direct agents working for one insurer, or independent agents representing the policyholder and selling from a range of insurers (Ward, 2003). Therefore, the choice of distribution strategy, according to (Kim, Mayers and Smith, 1996), incurs contracting costs due to insurer-agent conflicts (see also Marvel, 1982; Grossman and Hart, 1986; Sass and Gisser, 1989), as well as insurer-policyholder conflicts.

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[55] Agency costs are costs incurred in attempting to control incentive conflicts and include monitoring, bonding, and other contracting costs as well as any residual loss that may remain after optimal control mechanisms are applied (Jensen and Meckling, 1976).

[56] The standard definition of complementarity in economics states that two inputs to a production process are complements if a decrease in the price of one causes an increase in the use of the other (Milgrom and Roberts, 1995).

[57] Participating policies provide policyholders with a claim on the company's profits, or more commonly residual claimant rights (Krishnaswami and Pottier, 2002).

[58] Moreover, Ward (2003) argued that demutualisation, converting mutual to stock firms, is only expected when no other complementary modes of governance are introduced to monitor managerial discretion.

Firstly, regarding insurer-policyholder conflicts, the policyholder pay premiums in exchange for a bundle of contingent cash payments and services, but this prepayment, according to (Kim, Mayers and Smith, 1996), creates opportunities for exploitative behaviour by insurers. (Mayers and Smith, 1981) suggest that the use of independent agents[59] helps to control this type of opportunistic behaviour, due to their ability to negotiate claim settlements, and to threaten to switch their business to an alternative insurer, if an insurer has shown opportunistic behaviour against policyholders[60] (Mayers and Smith, 1981; Barrese and Nelson, 1992; Kim, Mayers and Smith, 1996). In the UK insurance industry, for example, independent agents are a key distribution channel, with 83% of life and 60% of non-life insurance business being sourced by independent agents in the year 2013 (Insurance Europe, 2016). In this way, (Ward, 2003) claimed that by monitoring managers and shareholders, independent agents may also reduce the agency costs associated with insurer-policyholder conflicts. Such an ability is justified by the fact that independent agents, according to (Ward, 2003), are qualified financial experts, who also represent many policyholders, by which any expended monitoring can provide wide benefits for the whole customer base. Finally, (Ward, 2003) stresses that independent agents are repeat purchasers, unlike most policyholders in life insurance especially, which means that as a result independent agents can recommend companies that show less opportunistic behaviour towards policyholders (Ward, 2003).

In relation to insurer-agent conflicts, the insurer has the incentive to renew business directly with the customer in order to reduce renewal commissions paid to the agent (Kim, Mayers and Smith, 1996). In the case of exclusive agents or branch office staff, the insurer decides on the renewal of an insurance policy, while the independent agents, on the other hand, own the customer list (names, coverage and renewal dates) and, thus, have the right to policy renewal and which of the insurers in their portfolio will receive the renewal business (Barrese and Nelson, 1992; Kim, Mayers and Smith, 1996). Therefore, (Barrese and Nelson, 1992) (Trigo-Gamarra, 2007) argued that insurers pay higher renewal commissions to independent agents, and thus incur higher monitoring costs, than in the case of exclusive agents, in order to keep their interests aligned, and to ensure that they do not move the client to another insurer. Indeed, as previously discussed, these higher costs are compensated for by higher service quality (Joskow, 1973; Cummins and Vanderhei, 1979; Barrese and Nelson, 1992; Berger, Cummins and Weiss, 1997; Klumpers, 2004; Brockett *et al.*, 2005), which is reflected, from a customer's point of view, in lower customer's search costs (Poseya and Tennyson, 1998), a

[59] According to Mayers and Smith (1981), Using independent agents have a comparative advantage in supplying higher service, higher-priced coverage.

[60] Moreover, in the case of independent agents reasons for selecting one product provider over another also have to be documented. Regulators audit agents on a regular basis and none compliance, or breach of the regulations, results in the imposition of fines. It is, therefore, difficult (but not impossible), for independent agents to act as agents of the life insurance companies, as opposed to their clients. (Ward, 2003)

better market overview, and better monitoring of the insurer (Regan, 1997), by screening different insurers for appropriate coverages, low prices, and financial stability (Trigo-Gamarra, 2007).

For the purpose of this study, distribution channels were classified by the degree of contact and the ownership of policy renewals (*Figure 4-1*), since the only matter for distribution strategies to effectively monitor opportunistic behaviour against policyholders is being non-controlled by the insurer, and having the right to renew policies themselves. Based on this proposed channel typology, channels that have similar control and policy renewal characteristics have been treated as single channels. Regarding policy renewals, independent agents have the right to renew policies themselves (Barrese and Nelson, 1992; Kim, Mayers and Smith, 1996; Ward, 2003; Trigo-Gamarra, 2007), while in the case of brokers and aggregators, their way of comparing prices from many insurers threatens opportunistic insurers, in which such behaviour is reflected mainly in higher prices for specific types of cover (Ward, 2003), since UK customers are sensitive about price (Kumar, 2009). Therefore, it can be argued that independent agents, as well as brokers and aggregators, have the ability to direct existing or new customers to other insurers that display less opportunistic behaviour (Mayers and Smith, 1981; Barrese and Nelson, 1992; Kim, Mayers and Smith, 1996; Ward, 2003), which results in two single distribution strategies and one mixed strategy (*Figure 4-4*, below).

No.	Distribution Strategy	Control	Policy Renewal
1	Exclusive Agents, Sales Force, Distance Selling, Bancassurance, Retailers & Affinity Partnerships	**High**	**Insurer**
2	Intermediaries & Aggregators	**Low**	Independent Agents(Agent) Brokers & Aggregators (Insurer)
3	Multi-Channel Strategy	-	-

Figure 4-4: Distribution Strategies and Corporate Governance

Figure 4-5, below, is an extension of *Figure 4-3*, by including independent agents between policyholders and the company (managers + shareholders) as a complementary corporate governance system, which depends upon its ability to mitigate the agency costs between policyholders and managers and shareholders, which, according to (Jensen and Meckling, 1976) should improve performance and increase the firm value. In the case of stock companies, independent agents help policyholders to monitor and control shareholders, while in mutual companies, independent agents attempt to monitor managers in the absence of shareholders (Ward, 2003).

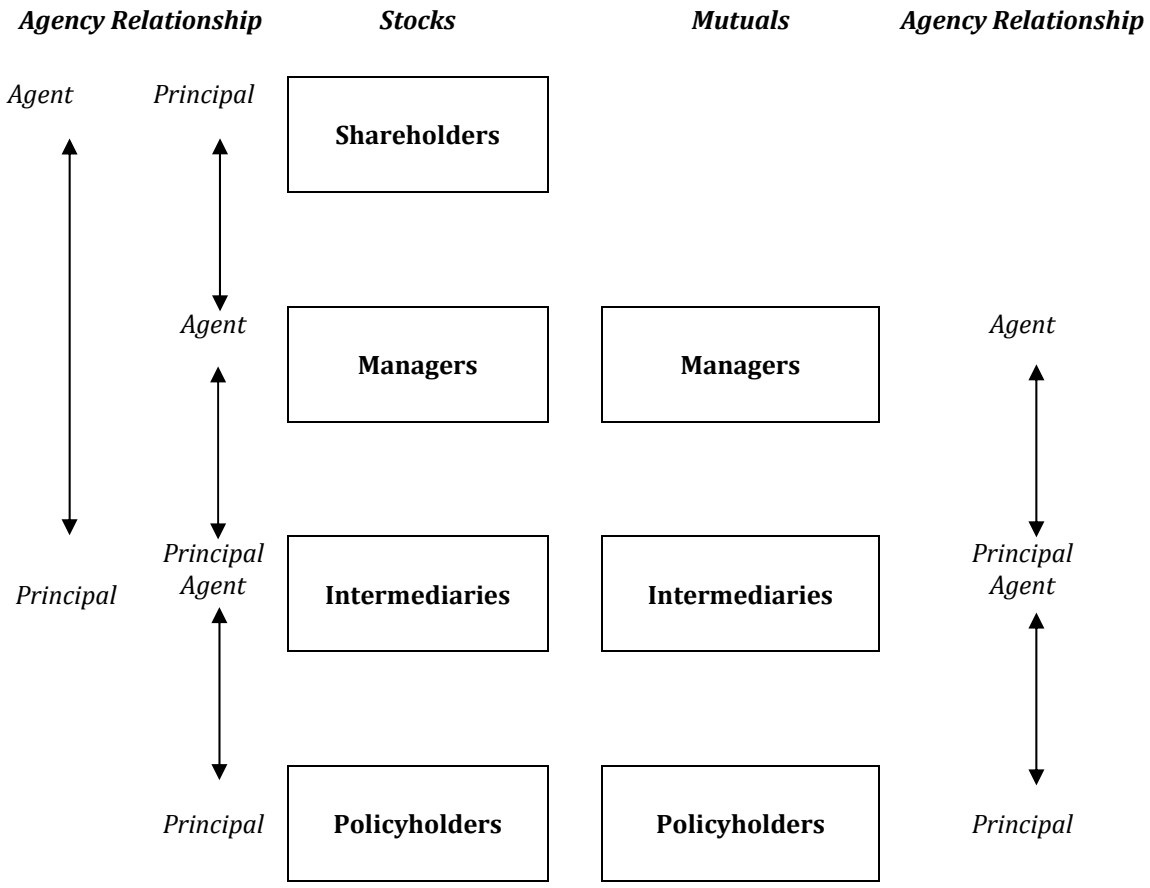

Figure 4-5: Independent Distribution and Agency Relationships
Source: (Ward, 2003)

To sum up, this study argues that independent agents help to bond the insurer's promise to provide services to policyholders, and help to control potential opportunistic behaviour by the insurer, leading to reduced agency costs and, thus, improved efficiency. Therefore, to be considered as a complementary corporate governance system, independent agents should strengthen the association between corporate governance and firm efficiency in the insurance industry, whether they are stocks or mutuals, as per the following hypotheses:

H3: There is a significant positive association between corporate governance and firm efficiency in the insurance industry

H4: The choice of independent agents help insurers to reduce the contracting conflicts, and associated agency costs, between policyholders, and managers and shareholders, leading to better firm efficiency.

4.3 Data and Methodology

This section first discusses the research philosophy, approach and methods used to answer the research questions, and justifies the choice of panel data analysis. It then describes the dataset and data sources, and finally, defines the variables used in this analysis.

4.3.1 Research Philosophy, Approach and Methods

Research philosophy is defined as a set of beliefs and views of the knowledge being examined in a research project, in which the philosophical assumptions justify how the research question will be answered (Flick, 2011; Saunders, Lewis and Thornhill, 2012; Bryman, 2012). The main research paradigms are *positivism*, *realism*, *interpretivism* and *pragmatism* (Saunders, Lewis and Thornhill, 2012). This study applied the positivism paradigm since its hypotheses, concerning the impact of corporate governance and distribution strategies on firm efficiency, and related theories could be empirically investigated using researchers' analysis tools rather than their values (Saunders, Lewis and Thornhill, 2012).

The choice of a specific philosophy helps to select the best-suited of two research approaches: deductive and inductive. The deductive approach starts from pre-existing theory to develop hypotheses, and to test those assumptions and, thus, it goes from general to the specific (Saunders, Lewis and Thornhill, 2012; Kothari, 2004; Silverman, 2013). In contrast, the inductive approach moves from the particular to general, as researchers start from observations, and then look for patterns in the data, which can help to generate new theories (Flick, 2011; Bryman and Bell, 2011). Therefore, this study implemented the deductive approach, as it was concerned with the need to investigate the casual relationships among variables in order to test hypotheses and, thus, generalise results rather than generating new theories (Saunders, Lewis and Thornhill, 2012).

Research methods have two main types, namely quantitative and qualitative. With quantitative methods, numeric data can be effectively collected from a large number of respondents, measured using various quantitative techniques, such as questionnaires and analysed using a variety of statistical analysis tools in order to test the established hypotheses (Goddard and Melville, 2004; May, 2011; Bryman, 2012). Qualitative methods, on the other hand, collect information using a descriptive and non-numerical approach, such as interviews, in order to examine the meaning of social phenomena, rather than the causal relationship between variables (Berg, 2004; Feilzer, 2010). Researchers have the choice to use either one or more quantitative methods, one or more qualitative methods, or even a mixture of both. The quantitative data required for empirical analysis is categorised into three groups: cross-

sectional data, time series data, and Longitudinal or panel data. In cross-sectional data, variables from several entities are collected at the same point of time, while in time series data, variables from one entity are observed over a period of time. In panel data, on the other hand, variables from several entities are gathered over a period of time (Gujarati, 2003; Goddard and Melville, 2004; Flick, 2011; Saunders, Lewis and Thornhill, 2012; Bryman, 2012; Greene, 2003; Huang, Hsiao and Lai, 2007)[61].

This study used quantitative methods to collect panel data in order to investigate the mediating role of agency costs on the association between corporate governance and firm performance of different insurance companies over a period of 10 years. Thereafter, the causal relationship between those three parties was examined using multiple regression analysis, as it was the most appropriate method of analysis when one dependent variable is assumed to be associated with two or more independent variables (Hair *et al.*, 2009) (see Diacon and O'sullivan, 1995; Core, Holthausen and Larcker, 1999; Bhagat and Bolton, 2008; Huang *et al.*, 2011).

4.3.2 Sample Selection and Data Sources

Similar to the last two chapters, the sampling frame for this study was extracted from FAME, a database that contains comprehensive information on companies in the UK and Ireland, which included all the 657 active insurance firms in the UK at the end of year 2014, both stock and

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[61] The basic regression model for panel data, (Greene, 2003), is written as:

$$\gamma_{it} = X'_{it}\beta + Z'_i\alpha + \varepsilon_{it}$$

Where:

- γ_{it} is the dependent variable.
- X'_{it} are the independent variables.
- β and α are coefficients.
- Z'_i is an unobserved entity specific effect.
- ε_{it} is the error term.
- $_i$ is index for entity
- $_t$ is index for time.

However, Greene (2003) argued that the individual effect Z'i contains a constant term and a set of individual of group specific variables. Those variables might be observed, such as gender and location, or unobserved, such as family specific characteristics, which are assumed to be constant over time (Greene, 2003). If Z'i is observed for all individuals, the original model turns into an ordinary least squares (OLS) model, or linear least squares model. Otherwise, panel data can be analysed using either fixed effects or random effects in order to capture the entity and time specific effects (Greene, 2003).

The primary difference between the fixed effects and random effects model is that the fixed effects model allows the intercepts of the regression to vary by entity, and does not require that individual entity effect to be independent of the regressors (Huang et al., 2007). Therefore, if Z'i is unobserved, but correlated with X'it, then the least squares estimator of β is biased and inconsistent due to omitted variables, and the fixed effects model is formulated as follows:

$$\gamma_{it} = X'_{it}\beta + \alpha_i + \varepsilon_{it}$$

Where:

- α_i is the unknown intercept for each entity.

The random effects model allows for differences among firms using the firm-specific error component εit, and does require the individual entity effect to be independent of the regressors (Huang et al., 2007) and, thus, the random effects model is expressed as follows:

$$\gamma_{it} = X'_{it}\beta + \alpha + u_i + \varepsilon_{it}$$

Where:

- u_i is a group specific random element.

In order to determine whether to apply the fixed effects or the random effects model, researchers often use the Hausman test (1978). Then, the Breusch-Pagan Lagrange Multiplier test (1979), or the F-Test, are required to decide between random effects or fixed effects models respectively, or an ordinary linear model (OLS).

mutual companies, and whether they were life, non-life, or composite. Moreover, those companies were either fully independent companies, parents of other subsidiaries, or subsidiaries of other companies, in that they had been authorised either by the UK [the Financial Conduct Authority (FCA)/ the Prudential Regulation Authority (PRA)], or by the European Economic Area (EEA). Given the statistical technique employed, firms for which the UK is not the main market, and firms with no insurance data available from the annual reports, were all excluded. For public-quoted companies, the firms also had to be listed at least for a year before the date of their accounting year end in 2003 to ensure that performance, capital structure and ownership were not affected by the new listing (Short and Keasey, 1999).

These sample selection criteria led to a sample of 67 firms, including 27 listed companies, with a total of 647 firm-year observations during the period 2004 – 2013. It started in 2004, which is a year after the release of the UK Corporate Governance Combined Code in 2003, and ended in 2013, the most recent year for which data was available at the time of data collection. Finally, information about the UK insurance firms, such as group status, UK Authorised, Listing in London Stock Exchange (LSE) or other international stock markets, was all obtained from the FAME database. On the other hand, due to the lack of a reliable secondary data source, all corporate governance data, major shareholders info, data about distribution channels, as well as inputs and outputs required to estimate the efficiency scores, were hand-collected from the annual reports and/or the websites of the sample firms. For companies where the directors' biographical data, board independence, board experience, and board out directorships were missing, other data sources were used, such as the FAME database, LinkedIn, DueDil.com (B2B Lead Generation-UK and Ireland), and endole.co.uk (UK Companies Info).

4.3.3 Variables: Description and Measurement

The key variables used in this study were the efficiency scores using DEA, distribution strategies, and the built corporate governance index (UKCGI), which consists of 35 binary variables across 5 sub-indices. Additional variables were added to the regression in order to control for the effects on firm efficiency, which were not captured by the corporate governance index and distribution strategies. A summary of all variables and their definitions as used in this study are presented in *Table 4-3*, below, while, the CG statements of the built corporate governance index (UKCGI) can be found in *Table 4-4*. Most measures of firm performance, agency costs, and the statements of corporate governance were estimated at the end of each year over the period 2004 to 2013.

Table 4-3: List of Variables

Variable Name	Label	Value	Source
Firm Performance			
TE_IN_CRS	Technical Efficiency CRS (Input-Oriented)	Input-Oriented Technical Efficiency under CRS (Constant Return to Scale)	Prepared and Compiled by the Researcher using Data Envelopment Analysis (DEA)
TE_IN_VRS	Pure Technical Efficiency VRS (Input-Oriented)	Input-Oriented Pure Technical Efficiency under VRS (Variable Return to Scale)	= (DEA)
TE_SCALE	Scale Efficiency	TE^{CRS}/TE^{VRS}	= (DEA)
TE_RTS	Return to Scale	Increasing, Decreasing, & Constant	= (DEA)
Distribution Strategies (Single vs Multi-Channel)			
DS_SFEA	Distribution Strategy_ Sales Force & Exclusive Agents Only	Yes=1, No=0	FAME & Annual Reports
DS_IMEDS	Distribution Strategy_Intermediaries Only	Yes=1, No=0	FAME & Annual Reports
DS_BRA	Distribution Strategy_Bancassurance, Retailers & Affinity Partnerships Only	Yes=1, No=0	FAME & Annual Reports
DS_OD	Distribution Strategy_Online (Direct) Only	Yes=1, No=0	FAME & Annual Reports
DS_OND	Distribution Strategy_Online (Indirect) Only	Yes=1, No=0	FAME & Annual Reports
DS_MLTI	Distribution Strategy_Multiple-Channel	Yes=1, No=0	FAME & Annual Reports
Distribution Strategies (Independent vs Direct)			
DS_IND	Distribution Strategy_Independent Only	Yes=1, No=0	FAME & Annual Reports
DS_NOIND	Distribution Strategy_Direct Only	Yes=1, No=0	FAME & Annual Reports
DS_MXDIND	Distribution Strategy_Mixed	Yes=1, No=0	FAME & Annual Reports
Corporate Governance			
UKCGI	UK Corporate Governance Index	consists of 35 binary statements categorised into 5 sub-indices (with missing values not considered)	Prepared and Compiled by the Researcher based on the UK CG Code 2003-2012
Control Variables			
Firm_Size	Firm Size	Ln (Total Assets)	Annual Reports
LVRG_DE	Financial Leverage	Total Liabilities (Debt) / Shareholders' Equity	FAME & Annual Reports
Life_Dummy	Whether it only transacts long-term insurance	Yes=1, No=0 (if this 0, and Non-life 0 => Composite)	FAME, Bank of England, Annual Reports
Non_Life_Dummy	Whether it only transacts general insurance	Yes=1, No=0 (if this 0, and life 0 => Composite)	FAME, Bank of England, Annual Reports

I. Distribution Strategies

Two channel typologies were adapted in this study in order to estimate the efficiency scores for single and multi-channel distribution strategies, and then to explore the impact of independent, direct and mixed strategies on the governance-efficiency association in the UK insurance industry (Figure *4-1*, Figure *4-2*, *Figure 4-4*, and *Table 4-3***Error! Reference source not found.**). The first channel typology classified the channels by both contact and control, and

resulted in five single strategies, which were: [1] sales force and exclusive agents, [2] intermediaries, [3] banks, retailers and affinity partnerships, [4] online direct writing, [5] aggregators, in addition to [6] multi-channel strategy. On the other hand, the second typology, using both control and policy renewal criteria, divided the channels into either (1) independent or (2) direct channels, as well as (3) a multi-channel strategy, including insurers who had implemented both types of agents.

II. Corporate Governance Index

In this study, the research's own corporate governance index (UKCGI) was considered to be the main independent variable of interest that covered most aspects of corporate governance practice in the UK, as discussed earlier in chapter 3 – Section 3.2.III, which gives full details of how the UKCGI was developed, scored and validated and, thus, is not repeated here. UKCGI is a composite measure of thirty-five statements and five sub-indices (*Table 4-4* below): Board Leadership, Board Effectiveness, Board Accountability, Board Remuneration, and Shareholders' Rights. The CG statements included in this index are based on the UK corporate governance codes from 2003 to 2012, and the guidance for unlisted companies in the UK in 2011, in order for the UKCGI to be comparable over the study period 2004-2013, and the data for those statements was extracted from the annual reports of the sample firms. The UK corporate governance code was considered to be an international corporate governance benchmarking tool due to its unique approach 'Comply or Explain', as well as its clear definition of good corporate governance practices starting from the Cadbury Committee in 1992 (Cadbury, 1992; FRC, 2003; FRC, 2006; FRC, 2008; Arcot, Bruno and Faure-Grimaud, 2009; FRC, 2010; FRC, 2012b; FRC, 2014).

UK Corporate Governance Index (UKCGI)

UKCGI = ∑ Actual Scores for CG Items / Maximum Score (without missing items)

Where for each statement: Y='1', N='0' (Non-disclosed items are not considered)

Table 4-4: UK Corporate Governance Index (UKCGI) Statements

No.	Statement	UK CG Code Provisions	UK CG Guidance and Principles for Unlisted Firms	Value Y=1, N=0
	Board Composition, Leadership & Independence			**Up to 7**
1	#The annual report should identify the Chairman, Chief Executive Officer (CEO) and Non-Executive Directors (NEDs).	A.1.2.	Principle 2	1, 0
2	#The board should identify in the annual report each non-executive director it considers to be independent.	B.1.1.	Principle 2	1, 0
3	#The annual report should identify the Chairmen and members of the three main board committees (nomination, audit & remuneration).	A.1.2.	Principle 4	1, 0
4	#The board should consists of 50% Independent non-executive directors at least (2 at least for small companies).	B.1.2.	Principle 10	1, 0
5	#The CEO and Chairman's duties should be separated (Board Non-Duality).	A.2.1.	Principle 3 + 10	1, 0
6	#The Chairman's other significant commitments should be disclosed to the board before appointment.	B.3.1.	Principle 3 + 10	1, 0
7	#The Chairman should be independent on appointment.	A.3.1.	Principle 3 + 10	1, 0
	Board Effectiveness			**Up to 7**
1	#The Company should have a secretary, and the access to its services and advice should be made available to all board members.	B.5.2.	Principle 2	1, 0
2	#All new directors joining the board should be given a full, official and tailored induction.	B.4.1.	Principle 8	1, 0
3	#The Company should arrange an appropriate insurance cover in respect of legal actions against its directors.	A.1.3.	Principle 2	1, 0
4	#The board and committees' members should have regular meetings during the year [For large companies: 8 board + 7 committees, For small companies: 4 board + 5 committees], including NEDs' meetings with Chairman only, or with the senior independent director only.	A.1.1.	Principle 4	1, 0
5	#The company should have a nomination committee.	B.2.1.	Principle 12	1, 0
6	#The nomination committee's report should include its work description, key responsibilities, and terms of reference.	B.2.4.	Principle 12	1, 0
7	#The nomination committee should comprise of 50% independent NEDs at least.	B.2.1.	Principle 12	1, 0
	Board Accountability			**Up to 7**
1	#The company should have an audit committee.	C.3.1.	Principle 12	1, 0
2	#The audit committee's report should include its work description, key responsibilities, terms of reference should also be included, as well as its role and the authority, financial statements, external audit process, non-audit services, objectivity & independence.	C.3.2. & C.3.3.	Principle 12	1, 0
3	#The audit committee should comprise solely of Ind NEDs.	C.3.1.	Principle 12	1, 0
4	#The chairman should not chair the audit committee (But may be a member if independent on appointment in smaller companies).	C.3.1.	x	1, 0
5	#The audit committee should include at least one member with relevant financial experience.	C.3.1.	Principle 12	1, 0
6	#The company should, at least annually, review of the effectiveness of the company's internal control systems.	C.2.1.	Principle 2 + 6	1, 0
7	#If the external auditor provides non-audit services, an explanation of how auditor objectivity and independence is safeguarded.	C.3.8.	Principle 6 + 12	1, 0
	Board Remuneration			**Up to 7**
1	#The company should have a remuneration committee.	D.2.1.	Principle 12	1, 0
2	#The remuneration committee's report should include its work description, key responsibilities, and terms of reference should be included, as well as its role and the authority.	D.2.1.	Principle 12	1, 0
3	#The remuneration committee should comprise solely of Ind NEDs.	D.2.1.	Principle 12	1, 0
4	#The company chairman should not chair the remuneration committee (But may be a member if independent on appointment).	D.2.1.	x	1, 0
5	#The board should state in the annual report how performance evaluation of the board, its committees and its individual directors has been conducted.	B.6.1.	Principle 2 + 13	1, 0
6	#Remuneration for executive directors should be compared with pay and employment conditions elsewhere in the group, and with other companies' remuneration.	D.1. Supporting Principles	Principle 5	1, 0
7	#The company should set the notice or contract periods at one year or less.	D.1.5.	x	1, 0

No.	Statement	UK CG Code Provisions	UK CG Guidance and Principles for Unlisted Firms	Value Y=1, N=0
	Shareholders' Rights			**Up to 7**
1	#There should be sufficient biographical details of the board of directors to enable shareholders to take an informed decision on their election or re-election.	B.7.1.	x	1, 0
2	#The board should appoint one of the independent non-executive directors to be the senior independent director, in case the normal channels of chairman, chief executive or other executive directors have failed to resolve any concerns they have.	A.4.1. & E.1.1.	x	1, 0
3	#The board should state the company's strategic aims, values and standards, its business model and strategy, and how the company generates or preserves value over the longer term.	C.1.1. & A.1 Supporting Principles	Principle 2 + 14	1, 0
4	#The board should state how it operates, its decision types and a strategic guideline, its business objectives, etc.	A.1.1. & C.1.2.	Principle 2 + 14	1, 0
5	#The directors should explain in the annual report their responsibility for preparing the annual report and accounts.	C.1.1.	Principle 2 + 14	1, 0
6	#The company should include a corporate governance statement, as well as a reference to the corporate governance code to which the company is subject, and a statement about compliance with that CG code.	DTR 7.2.1 R & DTR 7.2.9 R & DTR 7.2.4 G & LR 9.8.6 R	Principle 1 + 14	1, 0
7	#The board should state in the annual report the steps they have taken to ensure that board members have developed an understanding of the views of major shareholders about the company.	E.1.2.	Principle 7 + 14	1, 0

This table presents the 35 CG statements categorised equally into five CG sub-indices. Each of the CG statements was scored using the binary system in which, for the UKCGI items, the value given was '1' for the presence of the measured criteria in the firm, and Zero '0' otherwise. However, If a firm did not report on a particular item of the UKCGI, this item was not counted in the final score, while in the UKCGI_PSBL, the value Zero '0' was also given for such statement.

III. Efficiency Scores Measurement

According to (Cummins and Weiss, 2012; Cummins and Weiss, 2000), traditional performance measures have been dominated by frontier efficiency methodologies in terms of developing meaningful and reliable measures of firm performance, in which those modern measures summarize firm performance in a single measure relative to 'best practice' frontiers consisting of the dominate firms in the industry (see also Lin, Ma and Su, 2009; Nanka-Bruce, 2010)[62]. Traditional microeconomic theory assumes that all successful firms minimise costs and maximise profits, as they will not survive otherwise, while modern frontier methodologies estimate the efficiency and productivity of such firms that do not succeed in optimization (Cummins and Weiss, 2012). In general, *Efficiency* refers to "the success of a firm in minimising costs, maximizing revenue, or maximising profits, conditional on the existing technology" (Cummins and Weiss, 2012, p3), while *Productivity* refers to "changes in technology over time, such that firm can produce more output (technical progress), or less output (technical regress), utilising a given amount of inputs" (Cummins and Weiss, 2012, p3). In the following paragraphs, economic efficiency, total factor productivity, frontier efficiency methodologies, and data envelopment analysis (DEA) are discussed briefly, and the reader is referred to

[62] Nanka-Bruce (2010) used DEA efficiency scores to measure performance, which has been used also by Lin et al. (2009) as it compares firm performance to the revealed best-practice frontier.

(Banker, Charnes and Cooper, 1984; Charnes, Cooper and Thrall, 1991; Cummins, Tennyson and Weiss, 1999; Cooper, Seiford and Tone, 2000; Cummins and Weiss, 2000; Cooper, Seiford and Zhu, 2004; Cooper, Seiford and Tone, 2006; Cummins and Weiss, 2012) for a more detailed review, which has not been included here in order to save space.

Economic Efficiency, Total Factor Productivity, and Frontier Efficiency Methodologies

According to the microeconomic theory of the firm, the objective of a firm is to maximise profits by minimising cost and maximising revenues. Cummins and Weiss (2012) claimed that cost minimisation occurs when the firm minimises inputs conditional on the outputs produced, while revenue maximisation happens when the firm maximises outputs conditional on the inputs used [*Technical Efficiency*], although it is also important to choose the optimal combination of inputs, or outputs [*Allocative Efficiency*]. Therefore, *Cost Efficiency* is the product of technical efficiency and allocative efficiency (**CE = TE * AE**), i.e. costs might be higher than the frontier due to not using the most efficient technology (Technical Inefficiency) and/or not using the cost minimising input mix, or output mix (Allocative Inefficiency) (Cummins, Tennyson and Weiss, 1999; Cummins and Weiss, 2012). Therefore, Economic Efficiency can be estimated by comparing firms to the 'best practice' efficient frontiers, which consist of the most efficient firms in the industry (Cummins and Weiss, 2012). On the other hand, Total Factor Productivity is defined as the total quantity of outputs produced divided by the total inputs used in the production process (Fare, Grosskopf and Margaritis, 2008). In this regard, (Cummins and Weiss, 2012) argued that productivity and efficiency are related, since productivity at a given time is determined by the optimal technology available to produce outputs as well as the efficiency of firms that employ the technology.

There are two major methodologies to estimate frontiers: (1) econometric (parametric) approaches, mainly by using stochastic frontier analysis (SFA) (see Greene, 2008); and (2) mathematical programming (non-parametric) approaches, dominated by data envelopment analysis (DEA) (see Cooper, Seiford and Zhu, 2004; Fare, Grosskopf and Margaritis, 2008; Thanassoulis, Portela and Despic, 2008). The first technique for efficiency is the econometric approach, which is based on two stages: the choice of functional form and the approach used to separate random and inefficiency components of the error term, for which it is essential to make the right decision about both stages (Cummins and Weiss, 2000; Cummins and Weiss, 2012). The first stage is the estimation of a production, cost, revenue, or profit function, using an econometric method, such as ordinary least squares (OLS), while the second one is the separation of the estimated regression error terms into components, usually a two-sided random error component and a one-sided inefficiency component (Cummins and Weiss, 2000; Cummins and Weiss, 2012). However, in the second technique, the non-parametric approach

(DEA), neither functional form nor error term assumptions are required (Cummins and Weiss, 2000), while both efficiency and total factor productivity change can be estimated using such mathematical programming approaches (Cummins and Weiss, 2012). Indeed, it is argued that DEA results are highly correlated with conventional performance measures compared to the parametric approach, although the latter is also correlated and consistent with the DEA approach (Cummins, 1999; Cummins and Weiss, 2000).

Data Envelopment Analysis (DEA)

In order to estimate efficiency, data envelopment analysis (DEA) was introduced by Charnes, Cooper and Rhodes (1978), built on the method suggested by Farrell (1957), and used extensively in efficiency studies in a wide range of contexts (Charnes *et al.*, 2013), such as the public sector, including public schools and universities, (Lewin and Morey, 1981; Ruggiero, 1996; Thanassoulis *et al.*, 2016), energy and environmental studies (Zhou, Ang and Poh, 2008; Omid *et al.*, 2011; Zhou, Poh and Ang, 2016), infrastructure and transportation (Gillen and Lall, 1997; Martín, Gutiérrez and Román, 2004), health care (Jacobs, 2001; Pelone *et al.*, 2015), financial services, including banking (Sherman and Gold, 1985; Yue, 1992; Laplante and Paradi, 2015), and insurance (Cummins and Vanderhei, 1979; Cummins and Weiss, 2000; Yang, 2006; Eling and Luhnen, 2008; Ansah-Adu, Andoh and Abor, 2012; Cummins and Weiss, 2012). It is a non-parametric approach that calculates the 'best practice' efficient frontiers among other decision-making units (DMUs) in the industry that constitute the reference set and have an efficiency score of 1.0, and less than 1.0 for other DMUs that have not been included in the dominating set (Cummins and Weiss, 2000; Cummins and Weiss, 2012). DEA has also been used to split cost efficiency into its main components, technical efficiency (TE) and allocative efficiency (AE), as well as decomposing technical efficiency into pure technical efficiency (PTE) and scale efficiency (SE) (Cummins, Tennyson and Weiss, 1999). One of the most popular DEA models was proposed by Charnes, Cooper and Rhodes (1978) based on the assumption of constant return-to-scale (CRS) and known as the CCR model (Charnes *et al.*, 2013). Another widely used model introduced the variable return-to scale (VRS) suggested by Banker, Charnes and Cooper (1984) and is known as the BCC model (Charnes *et al.*, 2013). Other DEA models have been used less frequently in previous research, such as the additive model of Charnes *et al.* (1985), the multiplicative model of Charnes *et al.* (1982), and the Cone-Ratio DEA model of Charnes *et al.* (1990).

Finally, the results of efficiency analysis can be misleading or meaningless if inputs and outputs and their prices have been poorly defined, especially in the service sector, where many outputs are intangible and many prices are implicit and sometimes unavailable (Cummins and Weiss, 2000; Cummins and Weiss, 2012). Similar to other financial firms, insurance outputs comprise

mainly of intangible services, and so three major approaches have been implemented to measure such outputs – the asset (intermediation) approach, the user-cost approach, and the value-added approach (Berger and Humphrey, 1992; Cummins and Weiss, 2000; Cummins and Weiss, 2012; Berger *et al.*, 2000). The intermediation approach considers financial firms as pure financial intermediaries, in which the inputs consist of borrowed funds, such as policy reserves, and the outputs are assets (Brockett *et al.*, 2005). However, this approach would be inappropriate for insurance companies since they provide many services in addition to financial intermediation (Cummins, Tennyson and Weiss, 1999; Cummins and Weiss, 2012). The user-cost approach considers a financial product as input or output according to its net contribution to the revenues of the financial firm. If the financial returns on assets are more, or the financial costs are less, than the opportunity costs of funds, then the product is considered to be a financial output, while it is a financial input otherwise (Hancock, 1985). However, this method would not be appropriate for insurance companies either, since insurance policies bundle together many services with implicit prices (Cummins, Tennyson and Weiss, 1999; Cummins and Weiss, 2012). On the other hand, the value-added approach is the most appropriate method for insurance companies (Berger and Humphrey, 1992; Berger, Cummins and Weiss, 1997; Cummins, Tennyson and Weiss, 1999; Trigo-Gamarra and Growitsch, 2008; Eling and Luhnen, 2008; Trigo-Gamarra and Growitsch, 2010). It considers categories that have significant value-added, based on operating cost allocations, as important outputs, while other categories, according to their other features, might be considered as unimportant outputs, intermediate products, or inputs (Berger and Humphrey, 1992; Cummins, Tennyson and Weiss, 1999; Cummins and Weiss, 2000; Cummins and Weiss, 2012).

DEA Efficiency Scores for Insurance Companies

Following prior studies in the insurance industry, this study used data envelopment analysis (DEA), a non-parametric approach, to measure efficiency scores (Cummins, Tennyson and Weiss, 1999; Cummins and Weiss, 2000; Hardwick, Adams and Zou, 2003; Yang, 2006; Eling and Luhnen, 2008; Huang *et al.*, 2011; Ansah-Adu, Andoh and Abor, 2012; Cummins and Weiss, 2012; Brockett *et al.*, 2005). As a non-parametric method, DEA uses linear programming to measure the relationship between multiple inputs and outputs, enabling management to benchmark the best-practice decision-making units (DMUs), and to calculate scores denoting their efficiency, which can be explained as performance measures. Moreover, it is less vulnerable to the specification errors related to the parametric approaches, and less demanding in terms of the efficiency structure. Finally, DEA provides estimates of the potential improvements that can be made by inefficient DMUs (see Huang *et al.*, 2011; Cummins, Tennyson and Weiss, 1999; Cummins and Weiss, 2012).

There are certain considerations that have to be met when using DEA to estimate efficiency, namely, the number of DMUs, selection of inputs and outputs, negative numbers, zero values and missing data (Sarkis, 2002). Firstly, previous studies have suggested the number of DMUs to be used should range from at least twice the number of inputs and outputs considered to two times the product of inputs and outputs, in which those numbers should be used as minimums (Bowlin, 1998; Golany and Roll, 1989; Dyson *et al.*, 2001; Sarkis, 2002). Secondly, the selection of inputs and outputs (discussed below) should take into account total values, rather than quantities and prices, due to data availability, implicit prices, which are sometimes unavailable for insurance products and services (Cummins and Weiss, 2000; Cummins and Weiss, 2012), especially in small and non-listed companies. Thirdly, it has been argued that basic DEA models are not capable of analysing DMUs with negative numbers or zero values for inputs and outputs (Charnes, Cooper and Thrall, 1991; Sarkis, 2002). However, Bowlin (1998) argued that replacing the negative and zero values by a very small positive value that is less than any other value in the data set, would not affect the efficiency score. Finally, when some observations have missing inputs or outputs, it is usually better to eliminate any DMUs that lack data for any input or output, since the remedies for missing data are still quite limited and relatively subjective (Sarkis, 2002). All inputs and outputs in this study were checked, and negative and zeros values were replaced by a very small positive value, while no missing values were found. Inputs and outputs were then deflated by the UKCPI in order to be expressed in year 2004 thousand pounds units.

Inputs

Inputs for insurance companies can be categorised into three main groups: [1] labour (agent and home office); [2] business services, materials and physical capital; and [3] financial capital (debt and equity) (Cummins, Tennyson and Weiss, 1999; Cummins and Weiss, 2000; Huang, Hsiao and Lai, 2007; Huang *et al.*, 2011; Cummins and Weiss, 2012). Labour can be divided into agent labour and home office labour, due to different prices as well as different combinations by insurance firms, e.g. some firms using direct marketing in whole or in part, while others depend mainly on agents (Cummins, Tennyson and Weiss, 1999). Physical capital expenditures, such as machinery, office supplies, transportation and computers, are usually a small portion of the total capital and, hence, combined with business services and materials (Cummins, Tennyson and Weiss, 1999). Finally, financial capital, especially equity capital, has to be maintained in order for policyholders to be satisfied that payments would be paid even if claims exceed expectations, which indicates the importance of financial capital (Cummins, Tennyson and Weiss, 1999). Therefore, consistent with the previous literature and for the purpose of this study, four inputs were selected, which were personnel expenses (Yang, 2006; Huang, Hsiao and Lai, 2007; Huang *et al.*, 2011), operating expenses (agent commissions are

included) (Yang, 2006; Ansah-Adu, Andoh and Abor, 2012), invested assets[63] (Yang, 2006; Ansah-Adu, Andoh and Abor, 2012), and the number of distribution channels[64].

Outputs

Consistent with prior efficiency studies of financial firms, insurance outputs were estimated using the value-added approach, in which financial products with significant value added, based on operating cost allocations, were considered as outputs (Berger and Humphrey, 1992; Berger, Cummins and Weiss, 1997; Cummins, Tennyson and Weiss, 1999; Trigo-Gamarra and Growitsch, 2008; Eling and Luhnen, 2008; Trigo-Gamarra and Growitsch, 2010). In this regard, insurance companies provide three main services: risk-pooling and risk-bearing; real financial services relating to insured losses; and financial intermediation. Firstly, insurers collect premiums and pay claims, risk pooling function, resulting in underwriting and other related expenses that comprise a major part of the value added in insurance (Cummins, Tennyson and Weiss, 1999). Moreover, insurers can also help policyholders to mitigate risks resulting from unexpected loss and investment shocks, a risk bearing function (Cummins, Tennyson and Weiss, 1999). Secondly, insurers also provide other real financial services, such as financial planning, risk surveys, and loss prevention services (Cummins, Tennyson and Weiss, 1999). Finally, as previously discussed, insurers are pure financial intermediaries who have access to funds from policyholders, invest those funds into assets and other investments, and pay back claims and other expenses (Cummins, Tennyson and Weiss, 1999; Brockett *et al.*, 2005). As a result, the net interest margin between return earned on assets and return credited to policyholders represents the value-added of the intermediation function (Cummins, Tennyson and Weiss, 1999). Therefore, following the value added approach, and consistent with the previous literature and for the purpose of this study, three outputs were selected to reflect the various services provided by insurers, which were: net premiums earned (Yang, 2006; Huang, Hsiao and Lai, 2007; Ansah-Adu, Andoh and Abor, 2012), claims incurred (Yang, 2006; Huang, Hsiao and Lai, 2007; Huang *et al.*, 2011; Ansah-Adu, Andoh and Abor, 2012), and net investment income (Yang, 2006; Ansah-Adu, Andoh and Abor, 2012).

Table 4-5, below, presents the summary statistics for the inputs and outputs used in the efficiency analysis for the whole observation period. Multi-channel insurers showed the highest average values in all inputs and outputs, while online direct insurers had, by far, the lowest averages among other distribution strategies. It can also be seen from *Table 4-5* that

[63] Few studies have used this item as an output although logic says that a company invests in assets or other ways to get returns. Therefore, it is argued that invested assets should be considered as an input used to generate the net investment income as an output.
[64] It is also argued that the number of channels affects the output.

sales force and exclusive agents (SFEA) and the intermediaries (IMEDS) had the second and third highest outputs, respectively, while distribution via banks, retailers and affinity partnerships was the second lowest in terms of both inputs and outputs (*Table 4-5*).

Table 4-5: A Summary Statistics for Inputs and Outputs by Distribution Strategy (Single vs Multi-Channel)

Variable	SFEA	IMEDS	BRA	OD	Multi	Total
Inputs						
i_Staff Costs_DF04	64,271	56,310	52,300	39,443	408,524	182,590
i_Operating Costs_DF04	376,375	217,111	202,743	109,071	973,530	498,570
i_Invested Assets_DF04	7,171,415	8,617,086	3,185,581	4,353,752	47,400,000	22,200,000
i_Distribution Channels	1	1	1	1	3	2
Outputs						
o_Premiums Earned_DF04	639,233	654,893	584,086	453,631	3,943,638	1,810,711
o_Claims_DF04	523,165	612,556	294,674	385,492	4,085,636	1,820,645
o_Net Investment Income_DF04	606,354	481,617	257,541	200,073	3,480,038	1,571,616

Note: All variables are expressed in 2004 Thousand Sterling Pound units by deflating with the UK Consumer Price Index.
Where SFEA: Sales Force & Exclusive Agents, IMEDS: Independent Intermediaries, BRA: Bancassurance, Retailers & Affinity Partnerships, OD: Online Direct, Multi: Multi-Channel Strategy.

IV. Control Variables

In this study, some control variables were included in order to reduce the influence of confounding factors (Hussainey and Al-Najjar, 2012). Firstly, firm size, estimated by the logarithm of total assets, was added to capture the potential financing effect, as well as the potential scale and scope economies, related to larger firms (Short and Keasey, 1999; Ang, Cole and Lin, 2000), which might find it easier to utilise sales force or exclusive agents (Sass and Gisser, 1989; Kim, Mayers and Smith, 1996). (Filatotchev, Lien and Piesse, 2005; Hewa-Wellalage and Locke, 2011; Munisi and Randøy, 2013; Andreou, Louca and Panayides, 2014) have also used firm size as a control variable in their analysis.

FZIZE (Firm Size)

Firm Size = LN (Total Assets)

Financial leverage is calculated as the ratio of debt to equity, since high debt means debtholders monitor highly leveraged firms more closely and put pressure on such firms to adapt good governance practices (Broberg, Tagesson and Collin, 2010), while shareholders' equity is also related to the problems between managers and shareholders.

LVRG_DE (Financial Leverage)

Financial Leverage = Total Debt / Shareholders' Equity

On the other hand, prior studies have controlled for the industry type (Ang, Cole and Lin, 2000; Filatotchev, Lien and Piesse, 2005; Le and Buck, 2011; Hussainey and Al-Najjar, 2012; Munisi and Randøy, 2013; Al-Najjar and Hussainey, 2016). However, since only insurance firms have been included, this study has controlled for insurance line by using two dummy variables, life and non-life, to capture the possible variations in the level of efficiency and the choice of distribution strategy and corporate governance structure. The first dummy variable had the value '1' for firms selling life products only, and the other variable had '1' if were firms selling non-life products only (Diacon and O'sullivan, 1995), while assigning '0' for both variables indicated firms selling both life and non-life products (composite status).

LIFE, NONLIFE Dummy Variables

Life Company (Selling Life Products Only) ⟹ LIFE =1 & NONLIFE =0
Non-Life Company (Selling Non-Life Products Only) ⟹ LIFE =0 & NONLIFE =1
Composite Company (Selling Both Life & Non-Life Products) ⟹ LIFE =0 & NONLIFE =0

Finally, since there is a difference between mutual and stock insurance companies in terms of agency conflicts (Mayers and Smith, 1981; Diacon and O'sullivan, 1995; Ward, 2003; NAIC, 2015), one dummy variable was added to the regression models in order to control for the effects of being a mutual company with policyholders who were shareholders, or a stock company with separated shareholders and policyholders. The '1' value was then assigned if the company was quoted, whether publicly or privately, and '0' otherwise, as follows:

STCKvsMTL (Stock vs Mutual Dummy)

STCKvsMTL = '1' if Stock Company, '0' if Mutual Company.

4.4 Data Analysis and Discussion

This section presents the descriptive statistics, the robustness checks, the results of model specifications, the efficiency scores for distribution strategies and, finally, the regression results for the association between the UK corporate governance index (UKCGI) and firm efficiency through the choice of distribution strategy.

4.4.1 Descriptive Statistics

This sub-section presents an overview of the 67 sample firms over the period 2004-2013, and summarises the descriptive statistics for the corporate governance index, agency costs, firm performance and other control variables used in this study. Firstly, the following table provides an overview of the pooled sample firms (*Table 3-5*), in which the upper part of the table includes firms' characteristics. The table shows that firm age ranged from one year to 112 years during the period 2004-2013 with an average age of around 42 years, while firm size differed according to the way it was estimated, based on either total assets or the number of staff. For example, firm size, based on the natural logarithm of total assets, ranged from around 9 to 20, with an average of around 15. The sample comprised 23 life (34%), 36 non-life (54%) and 8 composite insurance companies, on average, during the period 2004-2014. Almost 97% of the headquarters were based in the UK, 96% of the companies were authorised by the UK authorities (FSA/PRA), and around 61% of sample firms were members of the Association of British Insurers (ABI). Finally, only 30% were publicly quoted between 2004-2013, which means that 20 out of the 67 firms were listed in the London Stock Exchange (LSE) and/or in other stock markets (see *Table 3-5*).

On the other hand, board's characteristics for the sample firms are presented in the lower part of the table (*Table 3-5*). In general, the average board size during the period 2004-2013 was around nine directors, with a minimum of two and a maximum of twenty-two directors. With regard to board structure, boards consisted of a majority (81%) of directors with UK nationality, while only 8.96% on average were female. Regarding board independence, *Table 3-5* shows that an average of 38% of board directors were independent non-executives, while only 15.35% of firms in the sample had the same person holding the positions of CEO and Chairman at the same time (Chair/CEO Duality), which is consistent with the recommendations of the Cadbury Report (Cadbury, 1992; FRC, 2014). In the terms of board experience, *Table 3-5* shows that the average board tenure ranged from a few months (0.17) to over ten years (10.35), with an average of around four years, while the average board age was a few months beyond 54 years old, with a minimum of 42 and a maximum of over 67 years old. Regarding board financial incentives and managerial ownership, the average board

remuneration was about £250k per year, and ranged from as little as £3,333 to a maximum of £1,271k, with an average of 33% paid to the highest paid directors, usually the CEOs. On the other hand, directors owned around 24% of the outstanding shares on average, although some firms had more than 59% managerial ownership, while the major shareholding ratio reached 76% on average. Finally, around 93% of sample firms used one of the big four audit firms[65], while the auditor independence ratio, calculated by the ratio of audit fees divided by the total fees paid to the external auditor, reached 73% on average (See *Table 3-5*).

Table 4-6: Overview of the Main Figures for the Pooled Sample

Variable	N	Median	Mean	SD	Min	Max
Firms' Characteristics						
FAGE	643	31	41.93	34.60	1	112
FSIZE_LN_A	647	14.53	14.80	2.14	8.87	19.73
FSIZE_LN_S	475	6.56	6.68	1.79	2.94	10.97
LIFE	647	0	0.34	0.47	0	1
NONLIFE	647	1	0.54	0.50	0	1
UKHDQRTR	647	1	0.97	0.16	0	1
UKAUTH	647	1	0.96	0.20	0	1
UKABI	647	1	0.61	0.49	0	1
LSTD_OR	647	0	0.30	0.46	0	1
LSTD_YEARS	165	11	15.74	14.57	1	49
Boards' Characteristics						
BRDSIZE	645	8	8.69	2.98	2	22
BRDUKRATIO	645	87.50%	80.60%	22.49%	0	1
BRDFMLRATIO	645	7.69%	8.96%	10.54%	0%	50%
INED	645	40%	38.16%	20.14%	0%	90%
BRDNONDLTY	645	1	84.65%	36.07%	0	1
BRDTNR	645	3.89	4.19	1.99	0.17	10.35
BRDAGE	645	55.15	54.29	4.88	41.95	67.71
BRDREM_AV	558	188	250.04	194.27	3.33	1,271.24
HPAIDDIR	551	33.02%	37.24%	15.39%	7.09%	93.83%
BRDOWN	396	0%	2.64%	10.93%	0%	83.94%
MJRSHRHLDRS	642	100%	76.34%	36.95%	0%	100%
AUDITORBIG4	647	1	92.89%	25.72%	0	1
AUDITORIND	636	74.27%	73.15%	22.10%	3.51%	100%

Where FAGE: Firm Age, FSIZE_LN_A: Firm Size = Ln (Total Assets), FSIZE_LN_S: Firm Size = Ln (Staff), LIFE: Life Dummy, NONLIFE: Non-Life Dummy, UKHDQRTR: Whether the headquarter is the UK, UKAUTH: Whether the company is authorised by the UK (FCA/PRA), UKABI: Whether the company is a member of the Association of British Insurers (ABI), LSTD_OR: Whether the company is listed (In the London Stock Exchange or another market), LSTD_YEARS: the number of years the company is listed, BRDSIZE: Board Size, BRDUKRATIO: Ratio of Board Members with UK Nationality, BRDFMLRATIO: Ratio of Board Female Members, INED: Ratio of Independent Non-Executive Directors, BRDNONDLTY: Whether CEO/Chairman are separated (Non-Duality), BRDTNR: Average Board Tenure, BRDAGE: Average Board Age, BRDREM_AV: Average Board Remuneration, HPAIDDIR: Remuneration for the highest paid

[65] The Big Four are the four largest international accountancy firms; PricewaterhouseCoopers (PwC), Deloitte, Ernst & Young (EY), and KPMG.

director, BRDOWN: Board Ownership Ratio, MJRSHRHLDRS: Ratio of Major Shareholders (3%). AUDITORBIG4: Auditor from Big 4 Audit Firms, AUDITORIND: Auditor Independence Ratio.

Therefore, the following sub-sections discuss the descriptive statistics that present the main features of the data used in this study, namely, mean, median, standard deviation, minimum, and maximum.

I. Distribution Strategies

Table 4-7, below, shows the descriptive statistics for the study period (2004-2013) categorised by distribution channels, single vs multi-channel distribution strategies, and independent vs direct distribution strategies. Firstly, intermediaries still dominated the distribution channels, with 70% of insurance companies using multi-tied agents and/or brokers, while the second most popular channel was direct writing through mail, telephone, websites, etc. (36.50%), while other channels have achieved less than 20% each (*Table 4-7*). In the second panel, where distribution strategies have been described based on a single or multi-channel strategy to sell insurance, around 37% of insurers had adapted a multi-channel strategy to sell insurance products. However, intermediaries, as a single strategy, were the most popular strategy among the other strategies, even multi-channel, at 43% (*Table 4-7*). On the other hand, sales force and exclusive agents reached only 11%, while direct writing and distribution through banks, retailers and affinity partnerships were the least popular single strategies at 4%, 3% respectively (*Table 4-7*). With regard to the channels included in the multi-channel strategy, *Table 4-8*, below, shows that direct writing was the most widespread channel among multi-channel insurers (90%), followed by intermediaries (75%), banks, retailers and affinity partnerships (37%), aggregators (31%) and, finally, sales force and exclusive agents (21%). Finally, the last panel represents distribution strategies classified by whether the inherent channels were independent, direct or mixed channels (*Table 4-7*). The independent distribution strategy, which included both intermediaries and aggregators, predominated the other two strategies, at 42.66%, while the other single strategy, in which insurers sold their products through non-independent (direct) channels, such as sales force, exclusive agents, direct writing, and banks, barely touched 21%. On the other hand, 33% of insurers preferred to use a mixed strategy, in which both independent and direct channels were used to sell insurance (*Table 4-7*).

Table 4-7: Descriptive Statistics for Pooled Sample (2004-2013) – [Distribution Channels & Distribution Strategies]

Variable	Label	N	Mean	SD
Distribution Channels				
CHNL_SFEA	Channel_Sales Force & Exclusive Agents	647	18.24%	38.65%
CHNL_IMEDS	Channel_Intermediaries (Agents & Brokers)	647	69.86%	45.92%
CHNL_BRA	Channel_Bancassurance, Retailers & Affinity Partnerships	647	16.38%	37.04%
CHNL_ONLINE_DRCT	Channel_Online_Direct Writing	647	36.48%	48.17%
CHNL_ONLINE_INDRCT	Channel_Online_Indirect (Aggregators)	647	11.13%	31.47%
Distribution Strategies (Single vs Multi-Channel)				
DS_SFEA	Distribution Strategy_ Sales Force & Exclusive Agents Only	647	10.82%	31.09%
DS_IMEDS	Distribution Strategy_Intermediaries Only	647	42.66%	49.50%
DS_BRA	Distribution Strategy_Bancassurance, Retailers & Affinity Partnerships Only	647	3.09%	17.32%
DS_OD	Distribution Strategy_Online (Direct) Only	647	4.02%	19.65%
DS_OND	Distribution Strategy_Online (Indirect) Only	647	0.00%	0.00%
DS_MLTI	Distribution Strategy_Multiple-Channel	647	36.01%	48.04%
Distribution Strategies (Independent vs Direct)				
DS_IND	Distribution Strategy_Independent Only	647	42.66%	49.50%
DS_NOIND	Distribution Strategy_Direct Only	647	21.02%	40.78%
DS_MXDIND	Distribution Strategy_Mixed	647	32.92%	47.03%

Table 4-8: Descriptive Statistics for Distribution Channels within Distribution Strategies

DIST_STRTGY_MLTPL	CHNL_SFEA	CHNL_IMEDS	CHNL_BRA	CHNL_ONLINE_DRCT	CHNL_ONLINE_INDRCT
SFEA	100.00%	0.00%	0.00%	0.00%	0.00%
MEDS	0.00%	100.00%	0.00%	0.00%	0.00%
BRA	0.00%	0.00%	100.00%	0.00%	0.00%
OD	0.00%	0.00%	0.00%	100.00%	0.00%
MC	20.60%	75.54%	36.91%	90.13%	30.90%
Total	**18.24%**	**69.86%**	**16.38%**	**36.48%**	**11.13%**

Where SFEA: Sales Force & Exclusive Agents, IMEDS: Independent Intermediaries, BRA: Bancassurance, Retailers & Affinity Partnerships, OD: Online Direct, MC: Multi-Channel Strategy.

In relation to insurance line, it can be seen from *Table 4-9*, below, that intermediaries were most popular among life, non-life and composite insurers, at 63%, 71% and 86% respectively, followed by sales force and exclusive agents for life insurers (31%), while direct writing was the second most popular for non-life (35%) and composite insurers (67%). In terms of single and multi-channel distribution strategies, intermediaries were by far the most prevalent single strategy for non-life insurers and life insurers as well (50% and 40%, respectively), and the

second most for composite insurers at around 31% (*Table 4-9*). On the other hand, *Table 4-9* shows that the multi-channel strategy was the strategy most adapted by composite insurers, at nearly 68%, and the second most for non-life insurers (37%), and shared the same percentage with sales force and exclusive agents for life insurers (23%). Finally, *Table 4-9* clearly highlights the large dominance of independent strategy in both life (40%) and non-life insurers (47%), and multi-channel distribution in composite insurers (55%).

Table 4-9: Descriptive Statistics for Pooled Sample (2004-2013) by Insurance Line – [Distribution Channels & Distribution Strategies]

Variable	**Insurance Line**		
Distribution Channels	**Life**	**Non-Life**	**Composite**
CHNL_SFEA	31.05%	11.11%	14.29%
CHNL_IMEDS	62.56%	70.94%	85.71%
CHNL_BRA	12.79%	16.24%	27.27%
CHNL_ONLINE_DRCT	27.40%	35.33%	67.53%
CHNL_ONLINE_INDRCT	2.28%	16.24%	12.99%
Distribution Systems (Single vs Multiple)	**Life**	**Non-Life**	**Composite**
DS_SFEA	22.83%	5.41%	1.30%
DS_IMEDS	39.73%	47.01%	31.17%
DS_BRA	4.57%	2.85%	0.00%
DS_OD	9.13%	1.71%	0.00%
DS_OND	0.00%	0.00%	0.00%
DS_MLTI	22.83%	37.32%	67.53%
Distribution Systems (Independent vs Direct)	**Life**	**Non-Life**	**Composite**
DS_IND	39.73%	47.01%	31.17%
DS_NOIND	36.53%	12.82%	14.29%
DS_MXDIND	22.83%	34.47%	54.55%

Where CHNL_SFEA: Channel_Sales Force & Exclusive Agents, CHNL_IMEDS : Channel_Intermediaries (Agents & Brokers), CHNL_BRA: Channel_Bancassurance, Retailers & Affinity Partnerships, CHNL_ONLINE_DRCT: Channel_Online_Direct Writing, CHNL_ONLINE_INDRCT: Channel_Online_Indirect (Aggregators), DS_SFEA: Distribution Strategy_ Sales Force & Exclusive Agents Only, DS_IMEDS: Distribution Strategy_Intermediaries Only, DS_BRA: Distribution Strategy_Bancassurance, Retailers & Affinity Partnerships Only, DS_OD: Distribution Strategy_Online (Direct) Only, DS_OND: Distribution Strategy_Online (Indirect) Only, DS_MLTI: Distribution Strategy_Multiple-Channel, DS_IND: Distribution Strategy_Independent Only, DS_NOIND: Distribution Strategy_Direct Only, DS_MXDIND: Distribution Strategy_Mixed.

II. DEA Efficiency Scores - Technical and Scale Efficiencies

As discussed in section 3.3., scale efficiency results were derived from the technical efficiency estimations with Constant Return to Scale (CRS) and Variable Return to Scale (VRS). *Table 4-11*, below shows the annual statistics for the period 2004-2013, including the number of firms,

average technical efficiencies under CRS (TE^{CRS}) and VRS (TE^{VRS}), as well as the scale efficiency scores (SE), for all insurers and by insurance line. Since efficiency scores were estimated separately for every year in the observation period, they were compared between the different groups during the study period, and related conclusions were drawn about the changes in efficiency level between the different groups over time. However, efficiency scores for the same group could not be compared by year due to the fact that the annual sub-samples did not include the same number of observations, especially before the year 2010 (*Table 4-11*).

Prior to comparing the efficiency scores of the sub-groups in the sample, the non-parametric Kruskal-Wallis equity-of-populations rank test was used (Kruskal and Wallis, 1952; Kruskal and Wallis, 1953). This test is a multiple generalisation of the two-sample Mann-Whitney-Wilcoxon test (Mann and Whitney, 1947; Wilcoxon, 1945) and, thus, compared more than two independent groups of sampled data in order to test the hypothesis that all groups came from identical populations, and that there were no significant differences between such groups. According to the Kruskal-Wallis test, there is a significant difference in the efficiency scores between the different distribution strategies (*Table 4-10*; *P*-Value=0.0001<0.05). The same results were obtained when comparing the efficiency scores of stock and mutual companies, insurers selling life, non-life, or both products, individual insurance firms, and finally, among small, medium and large companies (*Table 4-10*; *P*-Value=0.0001<0.05).

Table 4-10: Kruskal-Wallis Equality-of-Populations Rank Test for Efficiency Scores by Distribution Strategy and Insurance Line

Efficiency Scores' Comparison	Result*
Single vs Multi-Channel Strategies	P-Value=0.0001
Independent vs Direct Strategies	P-Value=0.0001
Stock vs Mutual Insurance Firms	P-Value=0.0001
Life, Non-Life & Composite Insurance Firms	P-Value=0.0001
Individual Insurance Firms (DMUs)	P-Value=0.0001
Small, Medium & Large Insurance Firms	P-Value=0.0001

**If P-value<0.05 => statistically significant difference in the median between the different groups*

The results showed that TE^{CRS} ranged between 71.41% and 80.75%, while TE^{VRS} swung between 75.81% and 88.81% during the observation period (*Table 4-11*). Moreover, due to the conflicting results between TE^{CRS} and TE^{VRS}, it was vital to analyse scale efficiency in order to determine how insurers could improve their efficiency by adjusting their size. *Table 4-11* indicates that scale efficiency (SE) fluctuated between 87% and 96% on average, meaning that moving to the optimal size could improve the efficiency of insurance firms by 13% and 4%, respectively. Regarding the insurance line, TE^{CRS} for life insurers spread between 67% and

89%, TE^{VRS} reached 96%, and scale efficiency (SE) swung between 83% and nearly 100%, while non-life insurers achieved TE^{CRS} scores between 56% and 80%, TE^{VRS} scores between 69% and up to 89%, and scale efficiency between 86% and 98% (*Table 4-11*). On the other hand, insurers who sold both life and non-life products suffered from lower levels of efficiency, based either on TE^{CRS} (62%-79%), or TE^{VRS} (72%%-84%), while, akin to life and non-life insurers, moving to optimal size would improve their efficiency by around 17% and 3% (*Table 4-11*).

Table 4-11: Technical & Scale Efficiency Scores by Insurance Line over study period (2004-2013)

Year	Total				Life				Non-Life				Composite			
	N	CRS	VRS	SE	N	CRS	VRS	SE	N	CRS	VRS	SE	N	CRS	VRS	SE
2004	57	71.41%	77.85%	92.58%	18	89.20%	89.66%	99.38%	27	56.32%	68.99%	85.90%	12	78.68%	80.09%	97.39%
2005	61	71.64%	75.81%	94.35%	20	84.15%	84.85%	97.12%	33	64.23%	71.06%	92.27%	8	70.89%	72.79%	96.01%
2006	64	75.59%	84.18%	89.92%	21	87.91%	96.03%	90.99%	35	68.09%	78.02%	88.15%	8	76.03%	80.02%	94.88%
2007	65	75.06%	78.52%	96.06%	22	79.07%	85.16%	92.98%	36	73.54%	75.21%	98.05%	7	70.33%	74.61%	95.51%
2008	66	71.81%	81.45%	87.37%	23	68.79%	81.98%	82.91%	36	73.76%	81.16%	90.73%	7	71.77%	81.18%	84.73%
2009	66	77.37%	85.93%	89.92%	23	78.91%	87.55%	90.03%	36	76.12%	85.21%	89.56%	7	78.72%	84.37%	91.40%
2010	67	80.75%	88.81%	90.85%	23	84.99%	92.59%	91.67%	37	79.98%	88.48%	90.32%	7	70.90%	78.16%	90.98%
2011	67	73.67%	82.30%	88.01%	23	67.09%	75.91%	85.15%	37	79.99%	88.19%	90.62%	7	61.89%	72.22%	83.55%
2012	67	80.32%	87.73%	90.82%	23	85.70%	89.40%	94.96%	37	78.83%	88.84%	88.47%	7	70.53%	76.39%	89.67%
2013	67	79.93%	87.24%	90.94%	23	85.19%	90.11%	93.34%	37	79.14%	88.11%	89.62%	7	66.78%	73.22%	90.07%
Total	**647**	**75.87%**	**83.14%**	**91.03%**	**219**	**80.82%**	**87.24%**	**91.61%**	**351**	**73.59%**	**81.82%**	**90.46%**	**77**	**72.15%**	**77.46%**	**91.91%**

Where CRS: Technical Efficiency under CRS (Constant Return to Scale), VRS: Technical Efficiency under VRS (Variable Return to Scale), SE: Scale Efficiency = TE_{CRS}/TE_{VRS},

III. UK Corporate Governance Index (UKCGI)

Similar to chapter 3, below are the descriptive statistics of this study's new UK corporate governance index (UKCGI), and its sub-indices for the pooled sample (*Table 4-12*). Firstly, the UK Corporate Governance Index (UKCGI), calculated as the ratio of each company score to the total maximum score (excluding missing statements), ranged from 9% to 100% with an average of around 59%. On the other hand, the corporate governance possible index (UKCGI_PSBL), calculated by including missing items in the total maximum score, had a lower average (48%) and a lower minimum ratio (3%) (*Table 4-12*). Regarding the UK corporate governance sub-indices, board remuneration (UKCGIREM_SUB) had the highest average of around 83%, board accountability (KCGIACNTBLTY_SUB) had the second highest (68%), while board effectiveness (UKCGIEFCTVNS_SUB), board leadership (UKCGILDRSHP_SUB), and shareholders' rights (UKCGIISHRHLDRS_SUB), had the lowest averages at 61.01%, 60.87%, and 54.10% respectively.

Table 4-12: UK Corporate Governance Index - Pooled Sample (2004-2013)

Variable	N	Median	Mean	SD	Min	Max
UKCGI	647	47.37%	59.12%	26.25%	9.09%	100.00%
UKCGI_PSBL	647	27.14%	47.62%	33.22%	2.86%	100.00%
UKCGILDRSHP_SUB	647	57.14%	60.87%	28.01%	0.00%	100.00%
UKCGIEFCTVNS_SUB	647	66.67%	61.01%	28.80%	0.00%	100.00%
UKCGIACNTBLTY_SUB	647	50.00%	68.17%	25.97%	0.00%	100.00%
UKCGIREM_SUB	272	100.00%	82.85%	28.78%	0.00%	100.00%
UKCGISHRHLDRS_SUB	647	35.71%	54.10%	30.85%	0.00%	100.00%

Where UKCGI: UK Corporate Governance Index, UKCGI_PSBL: UKCGI (Possible Score) with missing values considered as "Zero", UKCGILDRSHP_SUB: Board Leadership Sub-Index, UKCGIEFCTVNS_SUB: Board Effectiveness Sub-Index, UKCGIACNTBLTY_SUB: Board Accountability Sub-Index, UKCGIREM_SUB: Board Remuneration Sub-Index, UKCGISHRHLDRS_SUB: Shareholders Rights Sub-Index.

More details about the UK CG index and its sub-indices over the period 2004-2013 are presented in *Table 4-13* below. In general, 10 firms on average (16%) did not disclose governance information in their annual reports at all, while of those who disclosed, the compliance ratio reached 72% overall. With regard to the sub-indices, board accountability (UKCGIACNTBLTY_SUB) had the highest non-disclosure ratio (49%), followed by board effectiveness (UKCGIEFCTVNS_SUB) with 31%, and marginal non-disclosure ratios for the other sub-indices (less than 1%). On the other hand, board remuneration (UKCGIREM_SUB) and board accountability (UKCGIACNTBLTY_SUB) had the highest compliance ratio of the disclosed information (around 85% each), while shareholders' rights (UKCGIISHRHLDRS_SUB) had the worst non-compliance ratio so far (46%), followed by board leadership (UKCGILDRSHP_SUB) with an average of 39%.

Table 4-13: Descriptive Statistics for UK CG Sub-Indices

No.	Statement	Possible Score	Total Observations	Total Firms	No Disclosure	No Disclosure%	Compliance	Compliance%	No Compliance	No Compliance%
-	**UK Corporate Governance Index**	**35**	**647**	**65**	**10**	**16%**	**40**	**71.92%**	**17**	**28.08%**
[1]	Board Composition, Leadership & Independence Sub-Index	7	647	65	0.11	0.18%	39	61.00%	25	39.00%
[2]	Board Effectiveness Sub-Index	7	647	65	20	31%	48	73.76%	17	26.24%
[3]	Board Accountability Sub-Index	7	647	65	32	49%	55	85.30%	10	14.70%
[4]	Board Remuneration Sub-Index	7	256	26	0.12	0.46%	22	85.59%	4	14.41%
[5]	Shareholders' Rights Sub-Index	7	647	65	0.19	0.29%	35	53.96%	30	46.04%

Regarding the quality of corporate governance overtime, it is clear from *Table 4-14* that UKCGI had improved by 10% during the last 10 years, from 54% in 2004 to 64% in 2013. On the other hand, *Table 4-14* shows that board effectiveness had had a similar increasing trend (10%), while board leadership and accountability had increased by 13%, 12% respectively, but shareholders' rights had improved slightly, by less than 7% with a constant score during the period 2008-2011 (55%). However, although the highest average (88%), board remuneration had declined by 3% over the study period (2004-2013), with peak values for 2005 (89.52%) and 2006 only (90.89%) (*Table 4-14*).

Table 4-14: Descriptive Statistics for UKCGI & Sub-Indices by Years (2004-2013)

Year	N	UKCGI	UKCGSUB_ LDRSHP	UKCGSUB_ EFCTVNS	UKCGSUB_ ACNTBLTY	UKCGSUB_ REM	UKCGSUB_ SHRHLDRS
2004	57	54.19%	55.14%	54.34%	59.98%	87.59%	50.63%
2005	61	53.37%	52.22%	53.06%	63.86%	89.52%	49.34%
2006	64	56.97%	55.80%	60.31%	67.63%	90.89%	52.68%
2007	65	57.91%	58.46%	60.99%	67.25%	84.76%	53.30%
2008	66	59.22%	59.74%	61.36%	70.35%	77.58%	55.19%
2009	66	60.54%	62.77%	62.99%	70.24%	78.37%	55.19%
2010	67	60.20%	63.11%	62.97%	68.87%	79.40%	55.01%
2011	67	61.05%	64.61%	63.01%	69.62%	81.87%	55.01%
2012	67	62.39%	66.74%	64.18%	69.51%	79.87%	56.50%
2013	67	64.03%	68.23%	65.14%	72.78%	84.78%	57.14%
Total	**647**	**59.12%**	**60.87%**	**61.01%**	**68.17%**	**82.85%**	**54.10%**

Where UKCGI: UK Corporate Governance Index, UKCGI_PSBL: UKCGILDRSHP_SUB: Board Leadership Sub-Index, UKCGIEFCTVNS_SUB: Board Effectiveness Sub-Index, UKCGIACNTBLTY_SUB: Board Accountability Sub-Index, UKCGIREM_SUB: Board Remuneration Sub-Index, UKCGISHRHLDRS_SUB: Shareholders Rights Sub-Index.

IV. Control Variables

The descriptive statistics of the control variables are presented for the pooled sample (*Table 3-9*). Firstly, the firm size, as the natural logarithm of total assets, ranged from around '9' to '20', with an average of '15' approximately. On the other hand, the financial leverage, calculated as the ratio of debt to equity, swung from as low as '0' to a maximum of around '118', which was a huge ratio indicating that financing by debt in some firms had outweighed financing through shareholders' equity, with an average of about '12' only.

Table 4-15: Descriptive Statistics for Control Variables - Pooled Sample

Variable	N	Median	Mean	SD	Min	Max	Skewness	Kurtosis
FSIZE_LN_A	647	14.53	14.79	2.14	8.87	19.73	0.22	2.95
LVRG_DE	621	4.47	11.57	17.49	0.01	117.84	3.01	13.69
LIFE	647	0.00%	33.85%	47.36%	0.00%	100.00%	0.68	1.47
NONLIFE	647	100.00%	54.25%	49.86%	0.00%	100.00%	-0.17	1.03

Where FSIZE_LN_A: Firm Size=Ln(Total Assets), LVRG_DE: Financial Leverage (Total Debt / Total Equity), LIFE: Life Dummy, NONLIFE: Non-Life Dummy

4.4.2 Robustness Checks

An assessment of the robustness of the association within the data was carried out in order to identify potential endogenous variables. These checks were a correlation matrix, multicollinearity, heteroscedasticity and serial correlation tests.

I. Correlation Matrix

Both Spearman's and Pearson's Coefficients were estimated and are presented in *Table 4-16*, below, since there is no reliable test to check normality for relatively small samples. From this table, it can be seen that no high correlation (r=0.9 or above) was found among the independent and control variables (Pallant, 2011), indicating no multicollinearity problems. On the other hand, *Table 4-16* shows a positive significant correlation was found between the UK corporate governance index and the efficiency score, suggesting that firms with good corporate governance would have improved efficiency. Firm size and financial leverage had also a positive correlation with the efficiency score (*Table 4-16*).

Table 4-16: Correlation Matrix (Spearman's & Pearson's Correlations) [p<0.1]*

Spearman's\Pearson's	TE_IN_CRS	UKCGI	FSIZE_LN_A	LVRG_DE	LIFE	NONLIFE
TE_IN_CRS	**1.0000**	0.0993*	0.2888*	0.2104*	0.1459*	-0.1020*
UKCGI	0.0558	**1.0000**	0.4125*	0.1290*	0.1268*	-0.2410*
FSIZE_LN_A	0.2646*	0.3170*	**1.0000**	0.4662*	0.3246*	-0.4235*
LVRG_DE	0.1799*	0.2169*	0.5103*	**1.0000**	0.5238*	-0.5244*
LIFE	0.1585*	0.0476	0.3062*	0.6156*	**1.0000**	-0.7789*

Spearman's\Pearson's	TE_IN_CRS	UKCGI	FSIZE_LN_A	LVRG_DE	LIFE	NONLIFE
NONLIFE	-0.1121*	-0.1576*	-0.3654*	-0.6134*	-0.7667*	**1.0000**

Where TE_IN_CRS: Technical Efficiency under CRS (Constant Return to Scale), UKCGI: UK Corporate Governance Index, *FSIZE_LN_A: Firm Size=Ln(Total Assets), LVRG_DE: Financial Leverage (Total Debt / Total Equity), LIFE: Life Dummy, NONLIFE: Non-Life Dummy*

II. Multicollinearity (VIF), Heteroscedasticity & Serial Correlation Tests

The first test was the variance inflation factor (VIF), which is used to identify the presence of multicollinearity, e.g. whether two or more variables are highly correlated, which might affect the estimation of the regression parameters (Hair *et al.*, 2009). The VIF test is written as follows (Wooldridge, 2002):

$$VIF = \frac{1}{1 - R_i^2}$$

Where:

R_i^2 is the unadjusted R^2 when X_i is regressed against all the other independent variables in the model.

Therefore, if the VIF result is bigger than 10, there is a problem with multicollinearity (Gujarati, 2003). The VIF for the proposed regression model was calculated (*Table 4-17*, below). The results showed no multicollinearity problem, since the mean VIF was less than 10 (1.95). Heteroscedasticity was also tested in this study using the modified Wald statistic, which indicated no problem with heteroscedasticity, as shown in *Table 16*. Finally, the Wooldridge test for autocorrelation in panel data was used and the results showed no problems with autocorrelation (*Table 4-17*).

Table 4-17: Multicollinearity (VIF), Heteroscedasticity & Serial Correlation Tests

Test	Results
Multicollinearity Test (VIF) *[if VIF<10 => there is no Multicollinearity problem]*	Mean VIF = 1.95
Modified Wald Test for GroupWise Heteroscedasticity *[if<0.05 => there is no Heteroscedasticity]*	Prob>chi2 = 0.0000
Wooldridge Test for Autocorrelation in Panel Data *[If<0.05 => Variables are not serially correlated]*	Prob>F = 0.0046

4.4.3 Model Specifications

Since this study used panel data to explore the mediating role of agency costs on the relationship between corporate governance and firm performance, some panel econometric tests were carried out in order to select the best panel model for the regression relationship. Those tests are the Hausman test, the Breusch-Pagan Lagrange Multiplier test (LM), the F-test, and finally, testing for time fixed effects (see Hausman, 1978; Gujarati, 2003; Greene, 2008;

Breusch and Pagan, 1979; Lomax, 2007; Torres-Reyna, 2007)[66]. *Table 4-18* below presents a summary of the specification tests for the proposed regression.

Table 4-18: Model Specifications

Specification Test	Results
Hausman test for fixed versus random effects model *[If ≤0.05 ⍰ Fixed Effects]*	Prob>chi2 = 0.0040
Breusch-Pagan LM test for random effects versus OLS *[if≤0.05 ⍰ use Random Effects]*	-
F-Test for fixed effects versus OLS *[if Prob>F ≤0.05 ⍰ use Fixed Effects]*	Prob>F= 0.0286
Testparm (Testing for Time-Fixed Effects) *[if≤0.05 ⍰ time fixed_effects needed]*	Prob>F= 0.0513
Decision	**Fixed Effects**

[66] Prior to multiple regression analysis, some model specifications were implemented on the panel data in order to select the most suitable regression model/s for this study.:

I. Hausman Test

The Durbin–Wu–Hausman test (also called the Hausman specification test) is a statistical hypothesis test in econometrics, developed in 1978 by Jerry A. Hausman (Hausman, 1978), has to be done first in order to determine whether the panel regression belongs to the fixed effects or random effects model, which helps to capture the effects of firm and time specific heterogeneities (Gujarati, 2003). The Hausman test is calculated as follows:

$$H = (\beta RE - \beta FE)'[Var(\beta FE) - Var(\beta RE)]\text{-}1\ (\beta RE - \beta FE)$$

Where:

$\boldsymbol{\beta_{FE}}$ are the coefficient estimates of the time-varying covariates from the fixed effects model.

$\boldsymbol{\beta_{RE}}$ are the corresponding estimated coefficients from the random effects model.

$\boldsymbol{Var(\beta_{FE})}$ is the estimate of the asymptotic (large sample) variances and covariance of the estimated coefficients.

$\boldsymbol{Var(\beta_{RE})}$ is the analogous quantity for the estimate of .

Therefore, if there is no correlation between the independent variable(s) and the unit effects, then estimates of β in the fixed effects model (βFE) should be similar to estimates of β in the random effects model (βRE) (Greene, 2008). In other words, if the result is equal or less than 0.05, the null hypothesis is rejected and the fixed effects model should be used since there are no differences between the estimates of $\boldsymbol{\beta}$ whether using fixed or random effects.

Then, either the Breusch-Pagan test (for random effects) or the F-test (for fixed effects) have to be carried out in order to make sure that the chosen model is more appropriate than the pooled ordinary linear model (OLS), as follows:

II. Breusch-Pagan Lagrange Multiplier Test (LM)

The Breusch–Pagan Lagrange Multiplier test (LM) was developed in 1979 by Trevor Breusch and Adrian Pagan (Breusch and Pagan, 1979), and is used to check the model for random effects based on the simple OLS (pooled) estimator (Gujarati, 2003). If $\hat{\boldsymbol{u}}_{it}$ is the $_{it}^{\text{th}}$ residual from the OLS regression, then the Lagrange multiplier test for one-way random effects is:

$$LM = \frac{NT}{2\,(T-1)}\left[\frac{\sum_{i=1}^{N}[\sum_{t=1}^{T}\hat{u}_{it}]^2}{\sum_{i=1}^{N}\sum_{t=1}^{T}\hat{u}_{it}} - 1\right]^2$$

In which failure to reject the null hypothesis, i.e. the result is higher than 0.05, suggests that there are no significant differences across units and, thus, no panel effect, which means OLS regression has to be done instead.

III. F-Test

An F-test is any statistical test in which the test statistic has an F-distribution under the null hypothesis. It is most often used when comparing statistical models that have been fitted to a data set, in order to identify the model that best fits the population from which the data was sampled. Sir Ronald A. Fisher initially developed the statistic as the variance ratio in the 1920s (Lomax, 2007). Suppose the fixed effects model is formulated as follows:

$$\boldsymbol{\gamma_{it} = X'_{it}\beta + u_i + \varepsilon_{it}}$$

The null hypothesis of the F-test following fixed effects regression is that in the proposed model, the observed and unobserved fixed effects ($\boldsymbol{u_i + \varepsilon_{it}}$) are equal to zero, i.e. they are equal across all units. Therefore, rejecting this hypothesis, when Prob>F is equal or less than 0.05, means that the fixed effects are non-zero, so the composite error terms ($\boldsymbol{u_i + \varepsilon_{it}}$) are correlated.

IV. Testing for Time-Fixed Effects (Testparm)

Finally, in order to see if time fixed effects are needed when running a fixed effects model, a joint test is needed to check whether the time dummies for all years are equal to zero or not (Torres-Reyna, 2007). If so, no time fixed effects are needed. On the other hand. if the Prob>F is equal or less than 0.05, the null hypothesis is rejected, meaning that coefficients for all years are not jointly equal to zero and, thus, time fixed effects have to be added to the model.

Firstly, the Hausman test rejected the null hypothesis; hence, the use of fixed effects regression and, thus, there was no need to use the Lagrange Multiplier test (LM) for random effects. Secondly, the F-Test was used to test the model for fixed effects, and found that fixed effects had to be used in this model, not the OLS regression (*Table 3-17*). Finally, by using Testparm for fixed effects, it was found that there was no need to add time fixed effects' dummies to the regression model (*Table 3-17*).

4.4.4 Results and Discussion

This sub-section discusses the main analysis results regarding the association between the choice of distribution strategy and firm performance on one hand, and the impact of such strategy on the quality of corporate governance structure, and the governance-efficiency association, on the other.

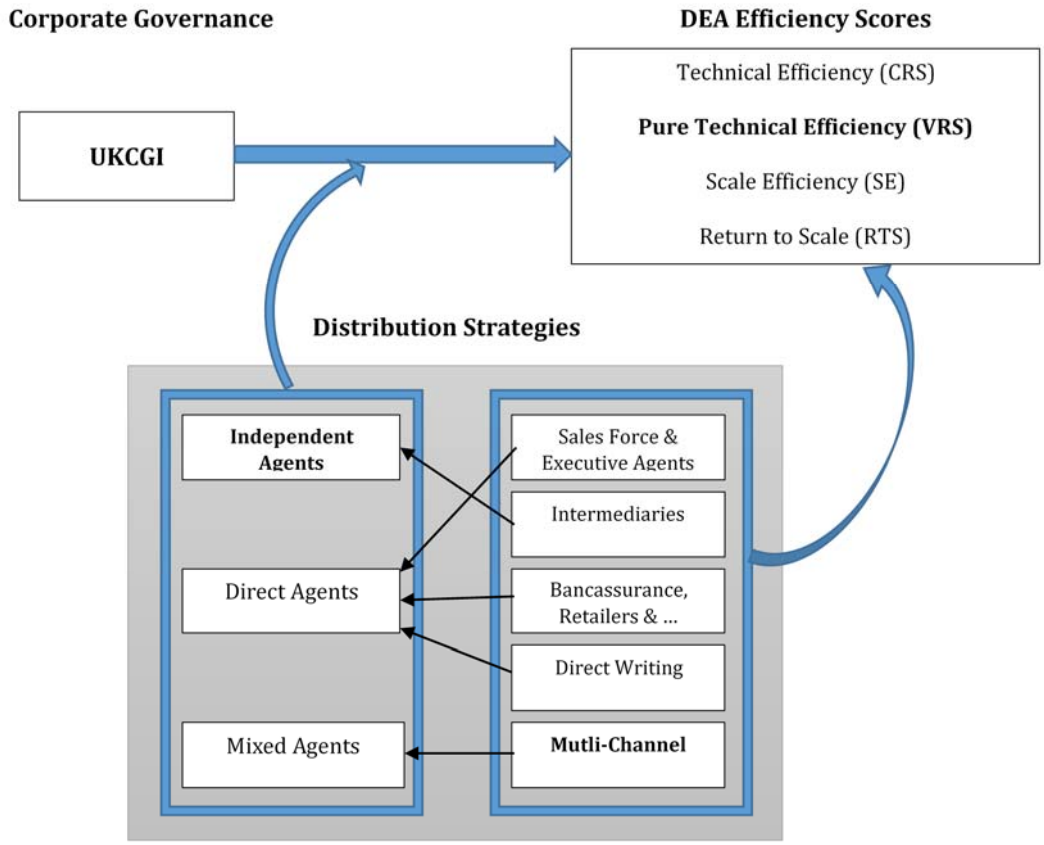

Figure 4-6: Framework of the Two-Stage Relationship: Corporate Governance, Distribution Strategy and Firm Efficiency
*(**Source**: the researcher's interpretation of the suggested two-stage framework of the relationship between distribution strategy and firm efficiency on one hand, and the impact of distribution strategy on the association between corporate governance and firm efficiency on the other.)*

I. Distribution Strategy and Efficiency Scores

The first aim of this study was to examine the association between firm performance and the choice of a specific distribution strategy, single- or multi-channel, to sell insurance products. Therefore, the main descriptive statistics regarding the efficiency scores of distribution strategies by year are presented in *Table 4-19* below, which reports the average technical efficiency based on CRS and VRS, and the scale efficiency, as well as for single and multi-channel strategies, during the study period 2004-2013. Under the assumption of both, constant return to scale and variable return to scale, sales force and exclusive agents showed the highest average efficiency (83%), while the multi-channel strategy had the second highest score based on CRS (79%), followed by banks, retailers and affinity partnerships (78%), which in turn had the second highest score based on VRS (82%), followed by direct writing (84%) (*Table 4-19*).

On the other hand, sales force and exclusive agents showed slightly lower scale efficiency scores that the multi-channel insurers, for most years, 2011 and 2013 especially, which seems to be the most efficient strategy reaching their optimal size. This scale efficiency was underlined by the fact that most multi-channel insurers operated under nearly constant return to scale (0.24), while RTS for other strategies ranged from 0.53 to 0.70 on average (*Table 4-19*). Banks, retailers and affinity partnerships, on the other hand, had the second highest scale efficiency at 95.35%, although most insurers using this strategy operated under increasing return to scale (*Table 4-19*). This is might be due to the fact that insurers benefit from the customer bases that banks, retailers and affinity partnerships have already established, and therefore they reach scale efficiency sooner than self-established channels. Finally, according to *Table 4-19*, direct writing had, by far, the worst scale efficiency among other strategies (77.61%), indicating that insurers using direct writing only are not able to operate at their optimal size and, thus, the channel should only be used together with other well-established channels to improve efficiency advantages.

Table 4-19: Technical & Scale Efficiency Scores by Distribution Strategy (Single vs Multi-Channel)

Year	Sales Force & Exclusive Agents					Intermediaries					Bancassurance, Retailers & Affinity Partnerships				
	N	CRS	VRS	SE	RTS	N	CRS	VRS	SE	RTS	N	CRS	VRS	SE	RTS
2004	7	86.30%	88.33%	97.44%	57.14%	25	67.64%	73.34%	92.78%	72.00%	2	74.51%	75.75%	98.31%	100.00%
2005	7	81.09%	82.21%	98.42%	57.14%	26	63.34%	68.58%	91.68%	69.23%	2	61.16%	61.99%	98.44%	100.00%
2006	7	91.50%	93.11%	98.34%	57.14%	27	66.72%	81.11%	82.64%	81.48%	2	63.05%	65.66%	96.06%	100.00%
2007	7	89.74%	89.76%	99.98%	42.86%	26	67.20%	71.16%	95.61%	84.62%	2	70.94%	71.07%	99.81%	100.00%

Year	Sales Force & Exclusive Agents					Intermediaries					Bancassurance, Retailers & Affinity Partnerships				
	N	CRS	VRS	SE	RTS	N	CRS	VRS	SE	RTS	N	CRS	VRS	SE	RTS
2008	7	80.95%	85.90%	90.13%	42.86%	27	70.34%	82.44%	83.32%	66.67%	2	80.37%	81.69%	97.92%	50.00%
2009	7	82.88%	88.24%	93.15%	57.14%	29	72.21%	82.97%	86.38%	68.97%	2	100.00%	100.00%	100.00%	0.00%
2010	7	83.19%	90.24%	91.26%	57.14%	29	80.96%	90.53%	88.70%	58.62%	2	91.70%	100.00%	91.70%	50.00%
2011	7	66.40%	78.89%	74.80%	71.43%	29	75.96%	86.33%	87.48%	55.17%	2	71.94%	78.40%	88.63%	50.00%
2012	7	86.97%	93.67%	91.77%	42.86%	29	78.69%	88.89%	87.82%	48.28%	2	87.58%	95.20%	92.26%	100.00%
2013	7	80.51%	90.52%	87.30%	42.86%	29	76.16%	86.73%	87.22%	58.62%	2	82.33%	90.08%	90.34%	50.00%
Total	**70**	**82.95%**	**88.09%**	**92.26%**	**52.86%**	**276**	**72.18%**	**81.56%**	**88.26%**	**65.94%**	**20**	**78.36%**	**81.98%**	**95.35%**	**70.00%**

Year	Online (Direct Writing)					Multi-Channel					Total				
	N	CRS	VRS	SE	RTS	N	CRS	VRS	SE	RTS	N	CRS	VRS	SE	RTS
2004	2	98.70%	98.79%	99.91%	50.00%	20	71.08%	76.83%	93.57%	40.00%	57	71.41%	77.85%	92.58%	59.65%
2005	3	83.09%	83.30%	99.59%	33.33%	20	79.18%	79.60%	99.35%	20.00%	61	71.64%	75.81%	94.35%	49.18%
2006	3	84.78%	88.32%	94.55%	33.33%	23	81.58%	84.76%	96.56%	39.13%	64	75.59%	84.18%	89.92%	60.94%
2007	3	56.89%	71.05%	79.87%	100.00%	24	80.67%	82.07%	98.49%	41.67%	65	75.06%	78.52%	96.06%	63.08%
2008	3	36.30%	71.08%	62.53%	100.00%	24	75.62%	77.99%	96.39%	20.83%	66	71.81%	81.45%	87.37%	48.48%
2009	3	64.89%	98.18%	66.67%	66.67%	23	83.53%	84.93%	98.30%	13.04%	66	77.37%	85.93%	89.92%	45.45%
2010	3	57.61%	96.03%	60.86%	66.67%	24	81.72%	83.56%	97.79%	12.50%	67	80.75%	88.81%	90.85%	41.79%
2011	2	42.56%	71.02%	59.27%	100.00%	25	73.57%	78.39%	93.60%	28.00%	67	73.67%	82.30%	88.01%	46.27%
2012	2	57.07%	78.04%	69.45%	100.00%	25	80.18%	83.92%	95.02%	28.00%	67	80.32%	87.73%	90.82%	43.28%
2013	2	73.40%	84.22%	84.18%	50.00%	25	82.85%	85.91%	96.14%	0.00%	67	79.93%	87.24%	90.94%	32.84%
Total	**26**	**65.16%**	**84.16%**	**77.61%**	**69.23%**	**233**	**79.10%**	**81.91%**	**96.50%**	**24.03%**	**647**	**75.87%**	**83.14%**	**91.03%**	**48.84%**

Where N: Number of Firms, CRS: Technical Efficiency under CRS (Constant Return to Scale), VRS: Technical Efficiency under VRS (Variable Return to Scale), SE: Scale Efficiency = TE_{CRS}/TE_{VRS}, RTS: Return to Scale (Increasing, Decreasing, Constant)

To sum up, although sales force and exclusive agents showed marginally higher efficiency scores than multi-channel insurers, the latter showed more ability to utilise their strengths efficiently and operate at their optimal size. Therefore, the first hypothesis (H_1) must be accepted, and the fact that implementing multi-channel strategy incurs extra expenses should be withdrawn by the more scale efficiency brought about by the use of more than one channel, suggesting that multi-channel insurers are more efficient than other single-channels insurers (Trigo-Gamarra, 2007; Trigo-Gamarra and Growitsch, 2008; Trigo-Gamarra and Growitsch, 2010). On the other hand, sales force and exclusive agents were the most efficient strategy among other single strategies based on both CRS and VRS (*Table 4-19*). However, taking into account the scale efficiency, *Table 4-19* shows that Bancassurance, retailers and affinity partnerships, by far, were the best single strategy that allowed insurers to operate efficiently at their optimal size, followed by sales force and exclusive agents, intermediaries, and online direct writing. This was true since insurers with such strategy were able to utilise the wide customer bases that banks, retailers and other affinity groups had already established, and to benefit from massive economics of scale without the need for huge investments (Easingwood and Coelho, 2003; Kumar, 2009). Though, sales force and exclusive agents, due to low scale efficiency (*Table 4-19*), had not yet reached a sufficiently large firm size to realise their theoretical advantages, which rejected the second hypothesis (H_2), that sales force and exclusive agents are the most efficient strategy compared to other single distribution strategies. This result was inconsistent with Chang, Peng and Fan (2011), who found that the Bancassurance channel were significantly less efficient than sales force and exclusive agents, while this study found that banks, retailers and affinity partnerships were, in fact, slightly less efficient, but with higher scale efficiency, than sales force and exclusive agents (*Table 4-19*). Finally, with regard to the intermediaries, being less efficient than direct strategies was consistent with (Berger, Cummins and Weiss, 1997), (Cummins, 1999), (Klumpers, 2004), but inconsistent with (Brockett *et al.*, 2005), which might be due to the fact that independent agents incur much higher costs, although they provide higher service quality (Joskow, 1973; Cummins and Vanderhei, 1979; Barrese and Nelson, 1992).

III. Governance-Efficiency Relationship and the Choice of Distribution Strategy

The second aim of this study was to examine the impact of corporate governance on firm efficiency in both stock and mutual insurance companies, and to explore the complementary role, if any, of a specific distribution strategy, namely independent strategy, on the association between corporate governance and firm efficiency in the UK insurance market during the period 2004-2013.

Main Regression Results

Table 4-20 shows the regression results between the corporate governance index (UKCGI) and the efficiency scores during the study period 2004-2013, in which the coefficient values and P-values (in brackets) are presented and discussed. Additional sub-regression models were run for the three different distribution strategies based on the extent to which insurers had control of the employed channels[67] (*Table 4-20*). For each model, variables were statistically evaluated by their P-value, which was considered to be highly significant at 0.01, significant at 0.05, or marginally significant at 0.1. The coefficient value, on the other hand, represented the average change in the dependent variable for one unit of change in the predictor (independent) variable while holding other predictors in the model constant.

$$\boldsymbol{TE\_IN\_VRS_{it}} = \beta 0 + \beta 1 * UKCGI + \beta 2 * FSIZE\_LN\_A + \beta 3 * LVRG\_DE + \beta 4 * LIFE + \beta 5 * NONLIFE + \alpha i + \varepsilon_{it}$$

Where:

***TE_IN_VRS**: is the dependent variable, and **UKCGI**: is the independent variable.*

***FSIZE_LN_A, LVRG_DE, LIFE, and NONLIFE**: are the control variables.*

***β_0**: is the intercept term, and **β_1 to β_{12}**: are the regression coefficients for independent variables.*

α_i: is a group-specific constant term.

ε_{it}: is the error term, i: is index for entity, and t: is index for time.

The first regression model explored the association between the corporate governance index (UKCGI) and firm efficiency, with other control variables included. *Table 4-20* shows a significant positive association between UKCGI and the efficiency score based on VRS at 10% significance level, in which the firm efficiency increased by 0.2% when corporate governance practices were enhanced by 1%. This result confirmed the third hypothesis (H_3) in general, and was consistent with agency theory and the prior literature (see Diacon and O'sullivan, 1995; Bhagat and Black, 1999; Core, Holthausen and Larcker, 1999; Weir and Laing, 2001; Klapper and Love, 2004; Thomsen, Pedersen and Kvist, 2006; Huang, Hsiao and Lai, 2007; Ponnu and

[67] In other words, the first strategy, independent agents, includes both independent intermediaries and aggregators only. The second strategy, direct agents, included all other channels that insurers had control of, which were sales force and exclusive agents, direct writing, banks, retailers and affinity partnerships, while the last strategy represented insurers who used both type of channels; independent and direct.

Karthigeyan, 2010; Le and Buck, 2011; Dedu and Chitan, 2013; Andreou, Louca and Panayides, 2014; Gupta and Sharma, 2014; Yoo and Jung, 2014), suggesting that corporate governance plays a vital monitoring role in minimising agency conflicts in order to ensure that the interests of managers, shareholders and other stakeholders are aligned and, thus, long-lasting firm efficiency is reached (Cadbury, 1992; Mayer, 1997; Diacon and O'sullivan, 1995; FRC, 2014).

The second, third and fourth regression models examined the governance-efficiency relationship for different categories of insurers based on the distribution strategy implemented. It can be seen from *Table 4-20* that corporate governance had a highly significant positive effect on the efficiency of insurers using independent distribution strategy only, while no statistically significant impact was found for insurers using a direct strategy, or even a mixed strategy. Moreover, the amount of corporate governance effect on firm efficiency, measured by the coefficient value, doubled when using an independent strategy to 0.4% from 0.2% when improving governance practices by 1%, indicating that corporate governance practices had become more efficient with the monitoring help of independent agents as a complementary corporate governance system, therefore, leading to improved performance, enhanced shareholders' wealth, as well as protecting other stakeholders' interests, especially policyholders. This result confirmed the fourth hypothesis (H_4) in general, and was consistent with the only two other similar studies by (Kim, Mayers and Smith, 1996) and (Ward, 2003) that found that the use of independent distribution strategy was more likely to assist in solving the remaining agency conflicts between shareholders, or managers in mutuals, and policyholders.

Table 4-20: Summary of Main Regression Results, and Results by Distribution Strategy (Independent vs Direct)

	Model 01	**Model 02**	**Model 03**	**Model 04**
VARIABLES	**Main**	**DS_IND**	**DS_NOIND**	**DS_MXDIND**
UKCGI	0.202**	0.393***	0.352	0.037
	(0.022)	(0.004)	(0.255)	(0.757)
Firm Size (Assets LN)	0.017	0.0331**	0.0836*	0.169***
	(0.103)	(0.026)	(0.059)	(0.000)
Leverage (Debt to Equity Ratio)	-0.00113	-0.000195	-0.0115*	-0.00785***
	(0.315)	(0.875)	(0.088)	(0.002)
Life Dummy	-0.176*	-	-	-0.252***
	(0.081)			(0.006)
Non-Life Dummy	-0.0531	-	-0.211	0.022
	(0.494)		(0.240)	(0.820)
Constant	0.558***	0.139	1.790***	-1.704***
	(0.001)	(0.504)	(0.002)	(0.001)
Number of ID	**66**	**32**	**13**	**24**
Observations	**621**	**276**	**123**	**204**
R-squared (within)	**0.0224**	**0.0652**	**0.0517**	**0.1584**
R-squared (between)	**0.0539**	**0.0666**	**0.1217**	**0.3058**
R-squared (overall)	**0.0179**	**0.0207**	**0.0378**	**0.1965**

pval in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Where DS_IND: Distribution Strategy_Independent Only, DS_NOIND: Distribution Strategy_Direct Only, DS_MXDIND: Distribution Strategy_Mixed.

Regression Results by Organisational Form (Stock vs Mutual)

Regarding organisational form, *Table 4-21* – the main regression results showed that corporate governance was more efficient in stock companies than in mutuals, due to the fact that shareholders play a significant role in monitoring the opportunistic behaviour of managers, in that improving corporate governance practice by 1% resulted in optimising performance and enhancing efficiency by 0.26%. This result confirmed the third hypothesis (H_3) in stock companies, and was consistent with agency theory and prior studies, such as (Mayers and Smith, 1981). However, shareholders in mutual companies, i.e. policyholders, cannot control the managers due to their widespread ownership (Ward, 2003), which was confirmed by a negative relationship, although it was not statistically significant (*Table 4-21*). The other three models in *Table 4-21* show the same regression for insurers using independent agents only (DS_IND), direct agents only (DS_NOIND), or multi-channel, including both independent and direct (DS_MXDIND). It was clear that corporate governance had augmented the effect on stock companies using independent agents only (0.378), while no significant effects were noticed for the other strategies.

Table 4-21: Summary of Main Regression Results by Organisational Structure (Stock vs Mutual)

VARIABLES	Main		DS_IND		DS_NOIND		DS_MXDIND	
	Stock	**Mutual**	**Stock**	**Mutual**	**Stock**	**Mutual**	**Stock**	**Mutual**
UKCGI	0.264***	-0.234	0.378***	1.71	0.558	-0.101	0.138	-0.684
	(0.004)	(0.443)	(0.007)	(0.136)	(0.179)	(0.797)	(0.262)	(0.290)
Firm Size (Assets LN)	0.016	-0.043	0.0338**	-0.675*	-0.0906*	-0.218	0.148***	0.015
	(0.134)	(0.795)	(0.023)	(0.075)	(0.068)	(0.332)	(0.000)	(0.972)
Leverage (Debt to Equity Ratio)	-0.000585	-0.0084	-0.000299	0.0327	0.0125*	0.019	-0.004	-0.012
	(0.613)	(0.172)	(0.811)	(0.115)	(0.096)	(0.498)	(0.137)	(0.346)
Constant	0.541***	1.695	0.138	8.569*	1.707***	3.985	-1.524***	1.257
	(0.001)	(0.462)	(0.508)	(0.068)	(0.007)	(0.203)	(0.002)	(0.838)
Number of ID	**61**	**6**	**31**	**1**	**11**	**3**	**22**	**2**
Observations	**571**	**50**	**266**	**10**	**94**	**29**	**193**	**11**
R-squared (within)	**0.0290**	**0.1281**	**0.0639**	**0.6022**	**0.0517**	**0.0711**	**0.1260**	**0.5063**
R-squared (between)	**0.0472**	**0.4653**	**0.0804**	**-**	**0.1670**	**1.0000**	**0.2672**	**1.0000**
R-squared (overall)	**0.0093**	**0.3198**	**0.0294**	**0.6022**	**0.0461**	**0.6540**	**0.1744**	**0.5127**

pval in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Where DS_IND: Distribution Strategy_Independent Only, DS_NOIND: Distribution Strategy_Direct Only, DS_MXDIND: Distribution Strategy_Mixed.

On the other hand, the impact of corporate governance on the efficiency of mutuals was still non-significant statistically, although the sign of the relationship had turned positive for mutual companies using independent agents only, indicating that independent agents helped

corporate governance in mutuals as well, although there was only weak evidence[68], to mitigate contracting conflicts, reduce agency costs and, thus, improve efficiency. This result, therefore, confirmed the last hypothesis, (H_4) in both stock and mutual companies, and was consistent with the results of (Ward, 2003), suggesting that independent agents, as a complementary corporate governance system, help to reduce the agency conflicts between insurers and policyholders in both stock and mutual companies, and contribute, as a result, to the overall corporate governance aim of mitigating agency conflicts between managers, shareholders, and other stakeholders' performance (Fama and Jensen, 1983; Shleifer and Vishny, 1986b; McKnight and Weir, 2009).

[68] This might be due to the small number of observations, leading to less accurate results, and the non-ability to measure the real effects of corporate governance on firm efficiency.

4.5 Conclusion

This section summarises the research findings of the data envelopment analysis (DEA) and the governance-efficiency regression model, features the research contributions, identifies the limitations and, finally, recommends some areas for further research.

4.5.1 Research Findings

The aim of this study was to compare firm efficiency in terms of distribution strategies, whether single or multi-channel, that insurance companies implemented in the UK during the period 2004-2013. It then examined the extent to which the choice of a specific distribution strategy, namely, independent agents, improved firm efficiency, by reducing agency conflicts between policyholders and managers and shareholders, acting as a complementary corporate governance system, in both stock and mutual insurance companies. The panel data set used in this study was hand-collected mainly from the annual reports of 67 UK insurance firms, consisting of both stock and mutual companies. Regarding firm efficiency, the data envelopment analysis (DEA) was used to estimate the technical efficiency scores annually over the study period 2004-2013, and used a combination of four inputs and three outputs. Distribution strategies were categorised into four single strategies; firstly, sales force and exclusive agents, secondly, independent intermediaries, thirdly, banks, retailers and affinity partnerships and, finally, online direct writing, in addition to a multi-channel strategy. With regard to corporate governance, the built UK corporate governance index (UKCGI) was used as a measure of the good practice, as discussed in depth in chapter 3. Finally, efficiency scores were checked for significant differences, while various robustness checks were carried out on the regression models followed by some specification tests. Hence the choice of the fixed effects model for the governance-efficiency regression model and the other sub-regression models. The main findings of DEA efficiency scores, and the regression models are summarised, as follows.

In the first stage, the different single and multi-channel distribution strategies were compared in terms of the firm efficiency scores under both assumptions, constant return to scale and variable return to scale, as well as the efficiency scale. It was evident that multi-channel insurers had higher scale efficiency than those using the other distribution strategies (Trigo-Gamarra, 2007; Trigo-Gamarra and Growitsch, 2008; Trigo-Gamarra and Growitsch, 2010), especially sales force and exclusive agents which had higher efficiency scores based on either CRS or VRS. In other words, although sales force and exclusive agents were the most efficient strategy, and they were able to retrieve some of their scale efficiency over time, it is assumed

that, compared to multi-channel insurers, they, as well as other single strategies, had not yet reached their optimal size to utilise their strengths and operate efficiently.

In the second stage, the association between corporate governance and firm efficiency was examined for insurers using independent, direct, or both types of agents as a distribution strategy. The results from *Table 4-20* showed a significant positive relationship between corporate governance, estimated by the UKCGI, and the efficiency score, under the assumption of variable return to scale, which was consistent with agency theory and the previous literature (Diacon and O'sullivan, 1995; Core, Holthausen and Larcker, 1999; Klapper and Love, 2004; Thomsen, Pedersen and Kvist, 2006; Huang, Hsiao and Lai, 2007; Le and Buck, 2011; Dedu and Chitan, 2013; Andreou, Louca and Panayides, 2014), indicating that good corporate governance does help to improve firm efficiency in insurance companies. With regard to the choice of distribution strategy, it was clear that improving corporate governance led to even better efficiency in insurance companies using independent agents only, while the relationship for insurers using other strategies was found to be statistically not significant (*Table 4-20*). More specifically, good corporate governance had a highly significant impact on firm efficiency in stock insurance companies, while its effect turned to weak negative in the case of mutuals. On the other hand, using independent agents as a complementary corporate governance system led to an augmented impact on firm efficiency in stock companies, while a positive effect, even though it was weak and not-statistically significant, was observed in mutual companies (*Table 4-21*).

4.5.2 Research Contributions and Policy Implications

Having defined single and multi-channel distribution strategies in the UK insurance industry, multi-channel insurers proved their ability to exploit their strengths and operate at their optimal size more than those using other single strategies, even those with higher efficiency scores. In particular, this study is the first, as far as the researcher knows, to investigate the impact of single and multi-channel strategies on firm efficiency, while most prior studies have focused on the most popular distribution systems, exclusive agents and independent agents, and only one study has examined the efficiency of multi-channel strategy with direct and independent strategies in pairs. On the other hand, using efficiency scores rather than individual performance measures, this study has also confirmed the significant positive association between corporate governance, estimated by the built corporate governance index (UKCGI) and firm performance, estimated by technical efficiency based on variable return to scale. However, although less efficient than other strategies, the use of independent agents represents an efficient mechanism to mitigate contracting conflicts and reduce agency costs

between policyholders, agents and insurers (managers and shareholders), acting as a complementary corporate governance system in both stock and mutual companies.

Regarding policy implications, this study could first help insurers themselves to assess and improve their efficiency by choosing the most efficient distribution strategy to operate at their optimal size with maximum scale efficiency, and/or to moderate agency conflicts between the insurers and their stakeholders, especially policyholders. It could also be helpful to regulators and policymakers for analysing the insurance market and the main trends regarding distribution structure, corporate governance practice and firm efficiency, in order to regularly update and amend the regulations towards a specific distribution strategy, and/or preferred corporate governance practices, which lead either to maximising efficiency directly, or to mitigating agency conflicts and monitoring costs and, thus, improve efficiency, as a result.

4.5.3 Research Limitations

Apart from being significant, the results have been exposed to a number of limitations. Firstly, regarding the efficiency measurement, although the choice of inputs and outputs has been justified by the previous literature, a different number of inputs or outputs, more or less, might lead to significant differences in the efficiency scores, which would alter the results partly or completely. Additionally, input prices were not used in this study due to implicit insurance prices for individual insurers, and the lack of a reliable source of average prices for the whole industry. Secondly, Borges, Nektarios and Barros (2008) have claimed that both of the DEA-CCR and DEA-BCC models used in this study, would successfully identify the inefficient units while being biased with efficient units, as too many units would be rated as efficient. Other DEA models have been suggested to solve this problem, such as the Cross-Efficiency DEA model (Sexton, Silkman and Hogan, 1986; Doyle and Green, 1994) and the Super-Efficiency DEA model (Andersen and Petersen, 1993). Moreover, Cummins and Weiss (1998) argued that in most applications of the non-parametric methodologies, such as the data envelopment analysis (DEA), any deviation from the frontier efficiency, even by random error or bad luck, should be considered as inefficiency. Finally, with regard to distribution strategies, a more precise classification rule could have been applied to distinguish single from multi-channel strategies if data about the contribution of each distribution channel had been available for each insurance company over the study period.

4.5.4 Further Research

Some further research areas and possible extensions of the present study can also be suggested. Firstly, this study identified the multi-channel strategy as a strategy that includes more than one channel, regardless of the contribution of each channel, or what strategies have

been used. Therefore, research into the structure of multi-channel strategies and its impact on firm efficiency is urgently needed. Secondly, since efficiency scores are estimated annually, it is necessary to adopt alternative DEA models for panel data, such as the Malmquist Productivity Index[69] (Caves, Christensen and Diewert, 1982; Fare *et al.*, 1994), which is a frontier-based method, mostly DEA, in order to estimate the Total Factor Productivity (TFP) change over time (see Grosskopf, 1993; Fare *et al.*, 1994; Cummins, Tennyson and Weiss, 1999; Cummins and Weiss, 2000; Eling and Luhnen, 2008; Eckles, Saardchom and Powell, 2011; Cummins and Weiss, 2012). Finally, further studies might explore the impact of distribution strategy as a complementary corporate governance system for different suggested categories, such as insurance line (life, non-life and composite), or quoting type (listed, non-listed).

[69] The theory of Malmquist Productivity Index was originated by Caves, Christensen and Diewert (1982) while the empirical methodology was suggested by Fare et al. (1994). The TFP change of firm has two primary components that can be estimated by the Malmquist Productivity Index as well: the shift in the production frontier over time, i.e. technical change, and the shift in the firm's location relative to the production frontier over time, i.e. technical efficiency change (Grosskopf, 1993; Fare et al., 1994; Cummins and Weiss, 2012).

Chapter 5

Conclusion

Chapter 5: Conclusion

The primary theme of this thesis has been Corporate Governance (CG) in the UK Insurance Industry, which connects the three core chapters' examination, from different perspectives, of the effectiveness of corporate governance on firm performance under different conditions and various methodologies. In this thesis, the impact of various corporate governance arrangements on the performance of UK life and non-life insurance firms, both listed and non-listed, during the period 2004-2013 has been examined, taking into account also the Financial Crisis of 2008 and the underwriting insurance cycle (First Core Chapter [Chapter 2]). Secondly, a corporate governance index has been developed by the researcher, and the mediating role of agency costs on the governance-performance association has been explored (Second Core Chapter [Chapter 3]). Finally, data envelopment analysis (DEA) has been employed to estimate a set of efficiency scores for the distribution strategies used in the insurance industry, and the complementary role of independent agents on corporate governance has been investigated in both stock and mutual companies (Third Core Chapter [Chapter 4]).

This section summarises the research findings of the three core chapters, highlights the policy implications of the whole thesis, underlines the limitations faced by the researcher and, finally, offers recommendations and suggests some areas for further research.

5.1 Research Key Findings

In the first core chapter, the aim was to examine the impact of various corporate governance arrangements on the firm performance, measured by the return on assets (ROA), the return on equity (ROE) and the adjusted combined ratio, in UK life and non-life insurance firms, both listed and non-listed, during the period 2004-2013. The second aim was to give insight into the effectiveness of corporate governance practices used prior to, throughout, and following, the Financial Crisis of (2007-09), as well as taking into account the underwriting insurance cycle.

The main findings showed that longer tenure length and an extra bonus ratio with higher ownership ratio for executives, but a shorter tenure length for independent non-executives, improved firm performance. However, board size, the proportion of independent non-executive directors (INEDs), board non-duality, the average number of INEDs outside directorships, major shareholders, and the auditor independence ratio were non-significant. Regarding the type of insurance, most corporate governance arrangements had a clear impact on firm performance in non-life insurance companies, while only tenure length and outside

directorships had significant effects on firm performance in life and composite companies. Secondly, being listed in a stock market made insurance firms more sensitive to the changes in corporate governance arrangements than non-listed companies, while tenure length and the average number of outside directorships for independent non-executives, major shareholders and independent auditor were the only arrangements that affected non-listed companies, albeit negatively. Thirdly, during the global financial crisis of 2007-09, the firms with separate chairman and CEO, longer tenure length for executives who were paid extra bonuses in cash rather than in shares and, finally, shorter tenure length for independent non-executives with less outside directorships, experienced improved performance compared to other insurance firms. Finally, in the soft market, additional independent non-executives with shorter tenure length and more outside directorships, extra bonuses and other performance-related benefits paid to executives, and more non-audit services provided by auditors, helped insurance firms to improve performance, despite the lower premiums and increased competition.

In the second core chapter, the aim was to assess whether the newly built UK Corporate Governance Index (UKCGI), developed by the researcher, indicated any association between governance structure and firm performance, measured by the return on assets (ROA), in the UK life and non-life insurance companies, both listed and non-listed, during the period 2004-2013. The second aim was to investigate the mediating role of agency costs, estimated based on the asset turnover ratio, on the relationship between corporate governance and the performance of UK insurance companies. The UK corporate governance index consists of 35 statements categorised equally into five sub-indices representing the main aspects of the UK corporate governance code. Those sub-indices are board leadership, board effectiveness, board accountability, board remuneration and shareholders' rights.

The main findings indicated a significant association between the research's newly built corporate governance index (UKCGI) and firm performance, measured by the return on assets (ROA). Thereafter, three regression models were run in order to investigate the mediating role of agency costs on the relationship between the UK corporate governance index (UKCGI) and firm performance, as suggested by Baron and Kenny (1986). The first model confirmed that the corporate governance index had a significant positive impact on firm performance, and the second model also confirmed the significant negative association between corporate governance and agency costs. Finally, the last model indicated a highly negative significant impact of agency costs on firm performance, while the significant association between corporate governance and firm performance became insignificant, suggesting that the relationship between corporate governance and firm performance is fully mediated by agency costs. However, with regard to the UKCGI sub-indices, only the board effectiveness sub-index met the mediating conditions, although the governance-performance association was still

significant, suggesting that agency costs play a partial mediating role in the relationship between board effectiveness and firm performance.

In the third core chapter, the aim was to compare the efficiency of distribution strategies, whether single or multi-channel, that life and non-life insurance companies, both stock and mutual, implemented in the UK during the period 2004-2013. The second aim was to examine the extent to which the choice of independent agents as a complementary corporate governance system has any impact on the relationship between the newly built corporate governance index and firm efficiency, by reducing agency conflicts between policyholders and managers and shareholders. Regarding firm efficiency, data envelopment analysis (DEA) was used to estimate the technical efficiency scores yearly over the study period 2004-2013, using a combination of four inputs and three outputs. In the first stage, the efficiency scores of the different distribution strategies were compared under both assumptions; constant return to scale and variable return to scale, as well as the efficiency scale. The results indicated that although sales force and exclusive agents showed marginally higher efficiency scores than multi-channel insurers, the latter showed more ability to utilise their strengths efficiently and operate at their optimal size, as they had higher scale efficiency than the other distribution strategies. In the second stage, the association between corporate governance and firm efficiency was examined for insurers using different distribution strategies. The results showed a significant positive relationship between corporate governance, estimated by the UKCGI, and the efficiency scores, under the assumption of variable return to scale, indicating that good corporate governance does help to improve firm efficiency in insurance companies. Finally, with regard to the choice of distribution strategy, the results also showed that independent agency strategy does play a vital role as a complementary corporate governance system, with strong evidence for stock companies, but weaker evidence for mutuals.

5.2 Policy Implications

The research findings of the three core chapters appear to have significant implications for shareholders or investors, regulators and policy-makers, as well as for insurance companies themselves, and even for customers or policyholders, as follows.

Firstly, based on the first core chapter, investors should be aware of the specific corporate governance arrangements that have higher effect on the performance of the UK insurance firms in which they are considering to invest. Regulators and policy-makers, in turn, should draw on these results to revise the recommendations for the best practice of corporate governance that have not been associated with improved firm performance. Special attention should be drawn

to those arrangements that have different effects on listed or non-listed firms, life or non-life insurers, pre-, during, or following any turbulent periods.

Secondly, the corporate governance index, developed by the researcher in the second core chapter, could help investors to assess the governance structure of UK insurance companies when making investment decisions. It could also be a helpful benchmarking tool for regulators and policy makers, as well as for insurance companies themselves (self-benchmark). On the other hand, this study also has important consequences for both shareholders and managers of firms who are concerned about performance, suggesting that both principals and agents should be keen to adopt good corporate governance practices in order to mitigate agency costs, which, in turn, improve firm performance and, thus, shareholder wealth.

Finally, the results of the third core chapter could first help insurers themselves to assess and improve their efficiency, by choosing the most efficient distribution strategy to operate at their optimal size with maximum scale efficiency, and/or to moderate agency conflicts between the insurers and their stakeholders, especially policyholders. It could also be helpful for regulators and policymakers in analysing the insurance market and the main trends regarding distribution structure, corporate governance practice and firm efficiency, in order to regularly update and amend the regulations towards a specific distribution strategy, and/or preferred corporate governance practices, which lead either to maximising efficiency directly, or to mitigating agency conflicts and monitoring costs, and thus, improve efficiency.

To sum up, the results of this research have significant implications for investors, regulators and insurance companies themselves. More important, regulators should focus more on CG arrangements that fail to have an impact on improving performance, reducing agency costs or even that have an unexpected impact on firm performance, especially during a crisis period, and promote CG reform that considers the differences between stock and mutual firms, listed and non-listed, and even life, non-life and composite insurance companies. The results also suggest the need to check the effectiveness of the best practices of corporate governance more often, i.e. yearly, for any potential improvements that might help to effectively align the interests of managers, shareholders, policyholders and other stakeholders.

5.3 Research Limitations

As expected in any research, this study suffered from several limitations and weaknesses, which limit the significance of the research findings, and need to be acknowledged in order to provide recommendations for further research.

Firstly, regarding corporate governance measurement, this thesis did not examine all arrangements and practices used by the UK boards, or suggested by the UK corporate governance codes, since data for such variables was not available for all companies, from either

annual reports, FAME, or other online sources. For example, information on the biographical details for directors, board meetings, board experience and board sub-committees was available only for listed companies and most large non-listed companies, as the disclosure of such details is not compulsory for non-listed companies.

Secondly, regarding the newly built corporate governance index (UKCGI), the sub-index for board accountability had a low coefficient alpha score (0.3850). While 0.70 is the acceptable value for new scales (Devellis, 2003), although this is still a reliable sub-index, there is a little concern about the internal consistency[70] and its statements need to be revised and checked.

On the other hand, the index developed by the current research was based on the best practices of the UK corporate governance code, mainly for listed companies, as well as the Corporate Governance Guidance and Principles for Unlisted Companies in the UK. However, non-listed companies are not obliged to comply with either code, which might alter the validity of the newly built index, although listed companies are also free either to comply with the principles or to explain the reasons for non-compliance. Moreover, when scoring the UKCGI items, a specific item was not considered as a part of the index if the firm did not report that particular item, since both listed and non-listed firms were included where disclosure, either comply or explain, was compulsory only for listed firms, and voluntary otherwise.

Thirdly, with regard to agency costs measurement, since there was no direct way to measure the absolute value of agency costs, the relative agency costs for a specific firm were estimated, according to Ang, Cole and Lin (2000), by the difference in the asset turnover ratio between a firm and the firm with zero agency-cost, as suggested by Jensen and Meckling (1976). However, since there was no firm with 100 percentage owner-manager, implying a zero agency-cost, this study considered the firm with the maximum asset turnover ratio to be the reference point for comparison, or a zero agency-cost firm.

Fourthly, regarding firm performance measurement, this study utilised only accounting-based performance measures, since the sample included both listed and non-listed companies, in which market-based measures, such as Tobin's Q, cannot be estimated for non-listed companies.

Fifthly, regarding the DEA efficiency measurement, although the choice of inputs and outputs has been justified by the previous literature, a different number of inputs or outputs, more or less, might lead to significant differences in the efficiency scores and, thus, alter the results partly or completely. Additionally, input prices were not used in this study due to implicit insurance prices for individual insurers, and the lack of a reliable source of average prices for the whole industry. On the other hand, Borges, Nektarios and Barros (2008) have claimed that both the DEA-CCR and DEA-BCC models, which were used in this study, would successfully

[70] Internal Consistency means how closely related a set of items are as a group when measuring the same issue (Litwin, 1995; Devon et al., 2007).

identify the inefficient units, while being biased against efficient units, as too many units would be rated as efficient. Other DEA models have been suggested to solve this problem, such as the Cross-Efficiency DEA model (Sexton, Silkman and Hogan, 1986; Doyle and Green, 1994) and the Super-Efficiency DEA model (Andersen and Petersen, 1993). Moreover, Cummins and Weiss (1998) argued that in most applications of the non-parametric methodologies, such as the data envelopment analysis (DEA), any deviation from the frontier efficiency, even by random error or bad luck, would be considered as inefficiency.

Sixthly, with regard to distribution strategies, more precise classification rules would have been applied to distinguish single from multi-channel strategies if data about the contribution of each distribution channel had been available for each insurance company over the study period.

Sevenly, regarding the causality relationship, it was assumed that corporate governance affected performance in insurance companies, although reverse causality may occur in some cases, such as when a successful firm awards directors more shares, directors themselves might increase their ownership in such firms, or higher bonus and other performance-related benefits. Therefore, the results should be interpreted as a partial correlation, rather than a causal relationship.

Finally, it could be argued that the financial crisis 2007-09 has ongoing effects past 2009, in addition to the possible effects of the Eurozone crisis 2010-12, as well as the ongoing effects of the regular changes to the UK corporate governance code during the study period 2004-2013, with further anticipated, as per April 2016. Therefore, there is the possibility that such changes and extended effects have controlled the way that corporate governance affected performance, rather than assuming pure influence over the years 2004-2013, especially after the financial crisis of 2007-09.

5.4 Further Research

Further research areas and possible extensions of the present study are suggested as follows, in which some justifications are included in the above limitations.

Firstly, regarding corporate governance arrangements, this study calls for further investigation into the impact of specific activities that board members undertake within board committees, their experience in insurance, and their commitment to attending board and committees meetings. Moreover, the interacting relationship between CG arrangements should be considered, as some governance practices are treated as complements, even if, in fact, they might be substitutes (Bozec and Bozec, 2012; Yoo and Jung, 2014), such as the negative impact of tenure and the positive impact of experience.

Secondly, regarding the newly built corporate governance index (UKCGI), given the partial mediation results of the current corporate governance sub-indices (UKCGI), its statements need to be revised and tested in order to eliminate any co-linearity and inconsistency issues that might violate estimations and regression results. Moreover, future research on corporate governance might be concerned with adding more statements covering other CG arrangements that have not been included in the current UKCGI, and it might benefit from the addition of other indices and codes of practices from around the world in order to make it an international CG benchmarking index, rather than a UK CG index only.

Thirdly, regarding the DEA efficiency measurement, since efficiency scores have been estimated annually, it is necessary for future research to adopt alternative DEA models for panel data, such as the Malmquist Productivity Index[71] (Caves, Christensen and Diewert, 1982; Fare *et al.*, 1994), which is a frontier-based method, mostly DEA, in order to estimate the Total Factor Productivity (TFP) change over time (see Grosskopf, 1993; Fare *et al.*, 1994; Cummins, Tennyson and Weiss, 1999; Cummins and Weiss, 2000; Eling and Luhnen, 2008; Eckles, Saardchom and Powell, 2011; Cummins and Weiss, 2012)

Fourthly, regarding distribution strategies, this study has identified multi-channel strategy as a strategy that includes more than one channel, regardless of the contribution of each channel, or what strategies have been used. Therefore, further research is urgently encouraged into the structure of multi-channel strategies and its impact on firm efficiency.

Fifthly, further studies might explore the impact of distribution strategy as a complementary corporate governance system for different suggested categories, such as insurance line (life, non-life and composite) or quoting type (listed, non-listed), in order to explore any insights within such categories.

Finally, regarding the causality relationship, this research has presumed that corporate governance affects firm performance, although reverse causality may occur in some cases. Thus, further research could explore the direction of causation by using lagged independent variables (see Eisenberg, Sundgren and Wells, 1998) in order to see, for example, if there is any relationship between past performance and corporate governance.

[71] The theory of Malmquist Productivity Index was originated by Caves, Christensen and Diewert (1982) while the empirical methodology has been suggested by Fare et al. (1994). The TFP change of firm has two primary components that can be estimated by the Malmquist Productivity Index as well: the shift in the production frontier over time, i.e. technical change, and the shift in the firm's location relative to the production frontier over time, i.e. technical efficiency change (Grosskopf, 1993; Fare et al., 1994; Cummins and Weiss, 2012).

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