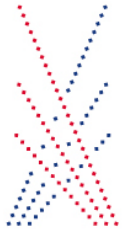

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How Efficient is Distribution Strategy as a Complementary Corporate Governance Instrument for the UK Insurance Industry?

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Abstract:

Distribution for an insurance company is considered one of the key success factors, where the chosen distribution strategy would significantly affect an insurer's profitability on the long-run. Applying the non-parametric data envelopment analysis (DEA), the aim of this study has been taken a different perspective to examine the extent to which the choice of a specific distribution strategy, namely Independent Intermediaries, would improve firm efficiency, by reducing agency conflicts between policyholders, managers, and shareholders. In other words, would a specific distribution strategy act as complementary corporate governance instrument in insurance companies, in the UK during the period 2004-2013? The main findings show that a significant positive association between corporate governance, estimated by the newly built corporate governance index (UKCGI), and firm performance, measured by the DEA efficiency scores, has been confirmed in stock companies. In the second stage, the results revealed that although multi-channel insurers have higher scale efficiency compared to other single strategies, using Independent Intermediaries as a distribution strategy does play a vital role as a complementary corporate governance instrument, which improve firm efficiency, with strong evidence for stock companies, but with weaker evidence for mutuals.

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

1. Introduction

Distribution for an insurance company is considered one of the key success factors, where the chosen distribution strategy. according to Klumpers (2004); Brockett et al. (2005), would significantly affect an insurer's profitability on the long-run. In the UK, both direct company sales forces and exclusive agents dominated the insurance distribution until deregulation in 1986, in which independent agents, banks, and retailers have become more popular thereafter (Webb and Pettigrew 1999). Thereafter, developments in information technology, such as process computerisation and call centres, have significantly helped direct insurance sales leading to more sales with less staff and associated costs (Webb and Pettigrew 1999). Aggregators, or price comparison websites, such as CompareTheMarket.com and MoneySupermarket.com, have also 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). Finally, apart from its importance for the whole UK economy as 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, 2013, 2014; Insurance Europe 2014; Swiss Re 2014; ABI 2015), 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).

On the other hand, according to Babu and P.Viswanatham (2013), corporate governance is considered 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. In this regard, some studies have investigated the impact of corporate governance on firm efficiency, mainly in the USA (Huang et al. 2007; Huang et al. 2011), with less in the UK (Hardwick et al. 2003). However, to the best of the researcher's knowledge, only two studies have examined the link between distribution strategies, corporate governance 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 et al. 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)[1] was used rather than individual corporate governance arrangements. To sum up, the following research question will be answered:

To what extent would the choice of distribution strategy improve corporate governance good practices, leading to enhanced efficiency?

2. Literature Review

2.1. Distribution in the UK Insurance Market

I. Regulatory Changes in the UK Insurance Market

In the UK, changes in distribution channels are mainly driven by regulatory and technological developments, 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 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 et al. 2014). 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. 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).

II. 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, 2010). According to O'Shaughnessy (1995, p639; 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.

[1] The establishment of the UKCGI has been thoroughly discussed in my working paper titled "Developing A Corporate Governance Index for the UK, A Necessary Panacea for the Insurance Industry?", which has been presented at the BAM2018 SIG Corporate Governance Conference at Leeds University during the period 11-12 June 2018.

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][2] (see ABI 2012, 2013, 2014, 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 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[3], including aggregators (35%), Bancassurance (12%), retailers and affinity partnerships (10%) and only 4% for company agents (ABI 2014). However, Table 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 1. Moreover, detailed numbers about the life distribution channels, as illustrated in Table 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 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 1).

Table 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%

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

[3] 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
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%
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*

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.

III. 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 et al. 1996; Trigo-

Gamarra 2008; Park et al. 2009), while 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). This study, however, will identify all available distribution channels, and categorise them later on based on several criteria, such as control, contact, or policy renewal (see Figure 1 below).

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
6	Distance Selling	High	Low	Insurer
7	Aggregators	Low	Low	Insurer

Figure 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.*

Having identified the distribution channels in the UK, the next step will be to select a specific criterion, either control, contract, policy renewal, or a mixture of more than one, that should be used to combine several channels into one distribution strategy. However, it is important to first investigate the types of relationships between corporate governance, distribution strategy and firm performance in the insurance industry in order to choose the most appropriate selection criterion/s for the purpose of this study.

2.2. 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, although many different theories have been emerged to explain corporate governance (see Mallin 2012)[4], the proposed hypotheses have been based on the agency

[4] 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

theory only since 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 mainly as complements to agency theory, rather than substitutes, with some exemptions (Daily et al. 2003, p.375).

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[5] are owned entirely by their policyholders[6], rather than shareholders, and so are not exposed to the market for corporate control (see Diacon and O'Sullivan 1995; O'Sullivan and Diacon 2003; Ward 2003; NAIC 2015). 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 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, since policyholders are the shareholders in mutuals.

Figure 2 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

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

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).

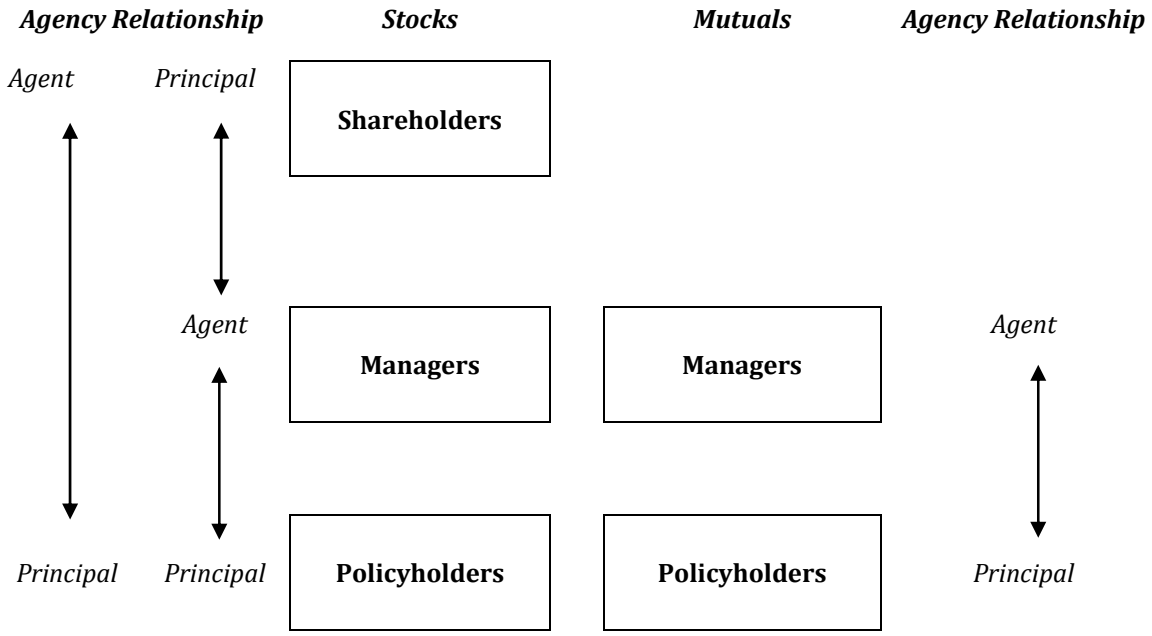

Figure 2*: Agency Relationship in the UK Insurance*

Source: (Ward 2003)

As a result, insurance companies will introduce complementary governance systems if there is a net reduction in the overall agency costs[7]: 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[8]. (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'[9] 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[10]. Therefore, there is a need for another alternative to be implemented in both stock and mutual companies as a complementary corporate governance system. (Kim et al. 1996) suggested the use of a distribution strategy as a complementary governance system,

[7] 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).

[8] 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).

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

[10] 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.

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 et al. 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.

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 et al. 1996), creates opportunities for exploitative behaviour by insurers. (Mayers and Smith 1981) suggest that the use of independent agents[11] 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[12] (Mayers and Smith 1981; Barrese and Nelson 1992; Kim et al. 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 et al. 1996). In the case

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

[12] 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)

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 et al. 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 et al. 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 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 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 et al. 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 et al. 1996; Ward 2003), which results in two single distribution strategies and one mixed strategy (Figure 3, below).

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

Figure 3*: Distribution Strategies and Corporate Governance*

Figure 4 below, is an extension of Figure 2, 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).

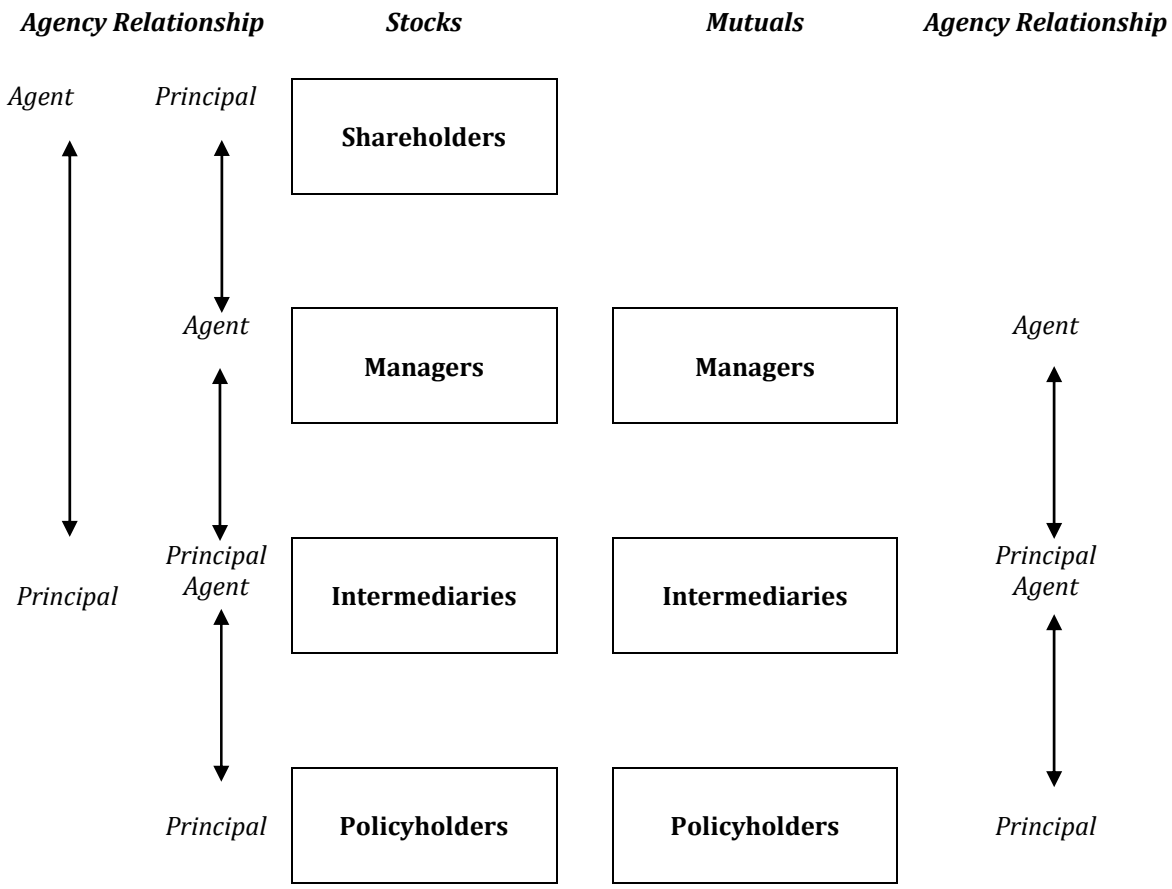

Figure 4*: Independent Distribution and Agency Relationships*

Source: (Ward 2003)

2.3. Hypothesis Development

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:

H1: There is a significant positive association between corporate governance and firm efficiency in the insurance industry

H2: 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.

3. Data and Methodology

3.1. Sample Selection and Data Sources

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 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).

3.2. 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 2, below, while, the CG statements of the built corporate governance index (UKCGI) can be found in

Table 3. Most measures of firm performance and the statements of corporate governance were estimated at the end of each year over the period 2004 to 2013.

Table 2*: 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 (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

As stated above, a channel typology based on both control and policy renewal criteria has been adopted in this study leading to the distribution strategies being divided into either (1) independent channels, (2) direct channels, or (3) a multi-channel strategy, including insurers who had implemented both types of agents (Figure 3).

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[13]. UKCGI is a composite measure of thirty-five statements and five sub-indices (
Table 3 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, 2006, 2008; Arcot et al. 2009; FRC 2010, 2012, 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 3*: 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

[13] The establishment of the UKCGI has been thoroughly discussed in my working paper titled "Developing A Corporate Governance Index for the UK, A Necessary Panacea for the Insurance Industry?", which has been presented at the BAM2018 SIG Corporate Governance Conference at Leeds University during the period 11-12 June 2018.

No.	Statement	UK CG Code Provisions	UK CG Guidance and Principles for Unlisted Firms	Value Y=1, N=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
	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 2000; Cummins and Weiss 2012), 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 et al. 2009; Nanka-Bruce 2010)[14]. 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 (Banker et al. 1984; Charnes et al. 1991; Cummins et al. 1999; Cooper et al. 2000; Cummins and Weiss 2000; Cooper et al. 2004; Cooper et al. 2006; Cummins and Weiss 2012) for a more detailed review, which has not been included here in order to save space.

Data Envelopment Analysis (DEA)

In order to estimate efficiency, data envelopment analysis (DEA) was introduced by Charnes et al. (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 et al. 2008; Omid et al. 2011; Zhou et al. 2016), infrastructure and transportation (Gillen and Lall 1997; MartÍn et al. 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 et al. 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).

[14] 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.

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 et al. 1999; Cummins and Weiss 2000; Hardwick et al. 2003; Brockett et al. 2005; Yang 2006; Eling and Luhnen 2008; Huang et al. 2011; Ansah-Adu et al. 2012; Cummins and Weiss 2012). 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 Cummins et al. 1999; Huang et al. 2011; Cummins and Weiss 2012).

Inputs

In line with previous literature (Cummins et al. 1999; Cummins and Weiss 2000; Huang et al. 2007; Huang et al. 2011; Cummins and Weiss 2012), and for the purpose of this study, four inputs were selected, which were personnel expenses (Yang 2006; Huang et al. 2007; Huang et al. 2011), operating expenses (agent commissions are included) (Yang 2006; Ansah-Adu et al. 2012), invested assets[15] (Yang 2006; Ansah-Adu et al. 2012), and the number of distribution channels[16].

Outputs

Consistent with prior efficiency studies of financial firms that followed the value added approach (Berger and Humphrey 1992; Berger et al. 1997; Cummins et al. 1999; Eling and Luhnen 2008; Trigo-Gamarra and Growitsch 2008, 2010), 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 et al. 2007; Ansah-Adu et al. 2012), claims incurred (Yang 2006; Huang et al. 2007; Huang et al. 2011; Ansah-Adu et al. 2012), and net investment income (Yang 2006; Ansah-Adu et al. 2012).

Table 4 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* that 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*).

[15] 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.
[16] It is also argued that the number of channels affects the output.

Table 4: 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 et al. 2000), which might find it easier to utilise sales force or exclusive agents (Sass and Gisser 1989; Kim et al. 1996). (Filatotchev et al. 2005; Hewa-Wellalage and Locke 2011; Munisi and Randøy 2013; Andreou et al. 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 et al. 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 et al. 2000; Filatotchev et al. 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. 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.

4.1. 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 distribution strategies, efficiency scores, and corporate

governance index. Firstly, the following table provides an overview of the pooled sample firms (Table 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 5).

Table 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

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

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 6 below, shows the descriptive statistics for the study period (2004-2013) categorised by distribution channels, and independent vs direct distribution strategies. In the first panel, 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 6). The last panel represents distribution strategies classified by whether the inherent channels were independent, direct or mixed channels (Table 6). 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 6).

Table 6*: 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 (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%

In relation to insurance line, it can be seen from Table 7, 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 7). On the other hand, Table 7 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 7*: 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 (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_IND: Distribution Strategy_Independent Only, DS_NOIND: Distribution Strategy_Direct Only, DS_MXDIND: Distribution Strategy_Mixed.

II. DEA Efficiency Scores - Technical and Scale Efficiencies

Scale efficiency results were derived from the technical efficiency estimations with Constant Return to Scale (CRS) and Variable Return to Scale (VRS). Table 9, 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 9).

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, 1953). This test is a multiple generalisation of the two-sample Mann-Whitney-Wilcoxon test (Wilcoxon 1945; Mann and Whitney 1947) 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, whether independent or direct, (Table 8; *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 8; *P*-Value=0.0001<0.05).

Table 8*: Kruskal-Wallis Equality-of-Populations Rank Test for Efficiency Scores by Distribution Strategy and Insurance Line*

Efficiency Scores' Comparison	Result*
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 9). 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 9 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 9). 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 9).

Table 9*: 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)

More details about the UK CG index (UKCGI) and its sub-indices over the period 2004-2013 are presented in Table 10 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 10*: 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 11 that UKCGI had improved by 10% during the last 10 years, from 54% in 2004 to 64% in 2013. On the other hand, Table 11 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 11).

Table 11*: 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%

Year	N	UKCGI	UKCGSUB_ LDRSHP	UKCGSUB_ EFCTVNS	UKCGSUB_ ACNTBLTY	UKCGSUB_ REM	UKCGSUB_ SHRHLDRS
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.

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, which are multicollinearity, heteroscedasticity and 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):

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

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 12, 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 12. Finally, the Wooldridge test for autocorrelation in panel data was used and the results showed no problems with autocorrelation (Table 12).

Table 12*: 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

4.3. 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; Breusch and Pagan 1979; Gujarati 2003; Lomax 2007; Torres-Reyna 2007; Greene 2008). Table 13 below presents a summary of the specification tests for the proposed regression.

Table 13*: 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**

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 13). 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 13).

4.4. Results and Discussion

This sub-section discusses the main analysis results regarding the impact of distribution strategy on the quality of corporate governance structure, and the governance-efficiency association.

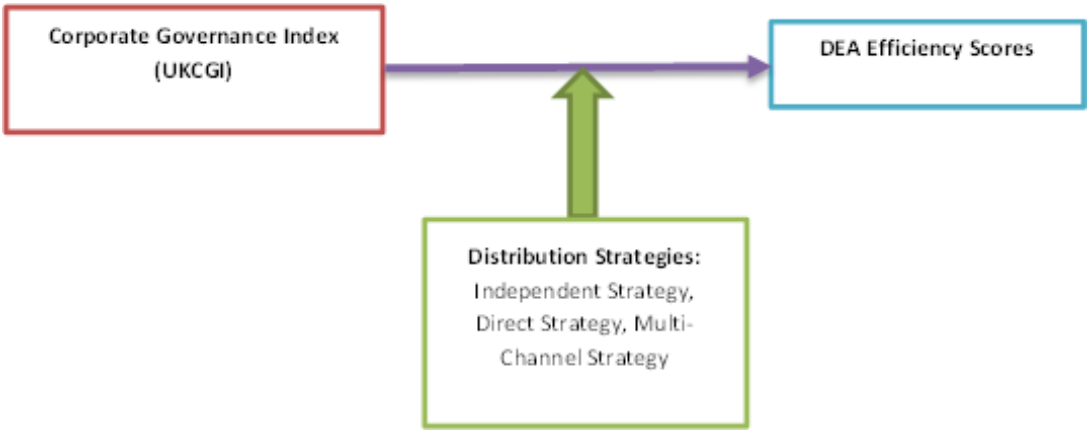

Figure 5: Framework of the moderating effect of Distribution Strategy on the relationship between Corporate Governance and Firm Efficiency (**Source**: the researcher's interpretation of the suggested framework of the impact of distribution strategy on the association between corporate governance and firm efficiency.)

Main Regression Results

Table 14 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[17] (Table 14). For each model, variables were statistically evaluated by their P-value, which was considered to be statistically highly significant at 0.001 (***), significant at 0.01 (**) and 0.05 (*). 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.

$$TE\_IN\_VRS_{it} = \beta 0 + \beta 1*UKCGI + \beta 2*FSIZE\_LN\_A + \beta 3*LVRG\_DE + \beta 4*LIFE + \beta 5*NONLIFE + \alpha i + \varepsilon_{it}$$

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 14 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 et al. 1999; Weir and Laing 2001; Klapper and Love 2004; Thomsen et al. 2006; Huang et al. 2007; Ponnu and Karthigeyan 2010; Le and Buck 2011; Dedu and Chitan 2013; Andreou et al. 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; Diacon and O'Sullivan 1995; Mayer 1997; FRC 2014).

[17] In other words, the first strategy, **independent strategy**, includes both independent intermediaries and aggregators only. The second strategy, **direct strategy**, 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, **mixed strategy**, represented insurers who used both type of channels; independent and direct.

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 14 that corporate governance had a highly significant positive effect on the efficiency of insurers using **independent 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 et al. 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 policyholders in one hand, and shareholders in stock companies, or managers in mutual, in the other hand.

Table 14*: 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 15 – 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 15). The other three models in Table 15 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 15*: 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[18], 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,

[18] 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.

shareholders, and other stakeholders' performance (Fama and Jensen 1983; Shleifer and Vishny 1986; McKnight and Weir 2009).

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.

5.1. Research Findings

The aim of this study was to examine 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 in the UK during the period 2004-2013, and the main findings are summarised, as follows:

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 14 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 et al. 1999; Klapper and Love 2004; Thomsen et al. 2006; Huang et al. 2007; Le and Buck 2011; Dedu and Chitan 2013; Andreou et al. 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 14). 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 15).

5.2. Research Contributions and Policy Implications

Having used efficiency scores rather than individual performance measures, this study has confirmed the significant positive association between corporate governance, estimated by our 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 instrument in insurance companies, with strong evidence for stock companies, but with weaker evidence for mutuals.

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.

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. On the other hand, 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. One more limitation related to the study period which needs to be extended beyond 2013 to make sure our findings still hold true (Data is currently being updated to 2018)

5.4. Further Research

Some further research areas and possible extensions of the present study can also be suggested. First, since efficiency scores are estimated annually, it is necessary to adopt alternative DEA models for panel data, such as the Malmquist Productivity Index[19] (Caves et al. 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 et al. 1999; Cummins and Weiss 2000; Eling

[19] 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).

and Luhnen 2008; Eckles et al. 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).

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