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The Impact of an Independent Board of Directors on the Audit Quality: An Analysis of FTSE 100 Listed Companies in the UK

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Abstract

The prevalent financial reporting frauds and scandals in the world have triggered the debate on corporate governance as a means to curtail the management rent-extracting behaviour and restrict manager opportunism. Independent board governance is a mechanism of corporate governance whereby the independent board of directors are responsible for aligning the different interests of the management and the shareholders and positively impacting the company strategy. This research study aimed to evaluate the effect of an independent board of directors on the audit quality in the FTSE 100 companies over a period of five years from 2012 to 2016. The independent variables are therefore the board size and the board independence while the dependent variable is the audit quality measured through the proxy of audit fees as per the O'Sullivan (2000) research study. Control variables of the profitability and capital structure were also incorporated into the operational FGLS regression model for more accurate results after applying different data cleaning techniques to remove biases from the data. The results showed that there was a positive significant effect of an independent board of directors on the audit quality of the companies. This compares with prior research findings and is in contrast to others as well. Lastly, even though the study has its limitations, it does provide the base for future research recommendations.

INTRODUCTION

Earnings management has been a widespread problem plaguing all levels of corporations not just locally in the United Kingdom but on the global landscape as well. Providing an overly positive view of the businesses of companies to stakeholders can be equally detrimental to the companies when the accounting books have been cooked to show profits but in reality, there are diminishing cash flows threatening the companies (Lin & Hwang, 2010). For this reason, there has been a global trend of increased transparency as well as accountability in companies following a slew of scandals. Soltani (2014), among many other researchers, has suggested that a reason for these financial frauds and scandals can be traced to weak auditing quality and controls which do not restrict the divergence of management goals from those of the company and its shareholders. It is therefore proposed through this research, on the other hand, that in the presence of a strong and independent board of governors with goals clearly aligned with the company and its various stakeholders there is a significant positive effect on the audit quality and the resulting clarity in financial operations of the company (O'Sullivan, 2000; Krishnamoorthy & Maletta, 2016).

A specific focus and integral part of the study of corporate governance is the board of directors of a company and they are directly responsible for making sure that the views and interests of the shareholders are safeguarded through putting in place significant internal controls as well as mitigating agency costs by being the mediating authority between the executive management and the stakeholders (Fama & Jensen, 1983). Thus, it is extremely pertinent to study the composition of the board of directors, their independence, in relation to the impact this has on the quality of the audit conducted (Baysinger & Hoskisson, 1990). It is also pertinent to note that prior research has posited that an independent board of directors invests more resources on higher quality audit engagements with reputed companies and spends more in audit fees which ultimately leads to greater audit quality and accountability (Srinidhi, et al., 2014; O'Sullivan, 2000),

This research study therefore starts first with the rationale behind it followed by a necessary literature review highlighting the key findings in the domain of corporate governance and audit quality by also focusing on the different historic research positions in support and opposite to the claim posited in this research. This leads to the methodology of the research which explains in detail the method of statistical analysis and the model used to present the findings. Through the focus of the study on FTSE 100 companies listed on the London Stock Exchange, the findings of the research have the generalisation potential to be applied to other countries having developed economies and similar characteristics as well. For the methodology the panel data analysis technique has been

applied which is a way of mitigating any biases that may be apparent in the statistical analysis. This coupled with the ordinary least square estimation make this study unique when compared with existing research as it attempts to reduce the measurement errors and biases caused by any omitted variables. Leading on from the methodology is the analysis of the data and findings which culminates in the discussion on the results followed by the implications as well as important limitations of the research. The study is concluded with future recommendations and summarising the research as well as the ethical considerations of the research, the resources used and the time scale of the preparation of this research up to its final form.

Problem Statement

Over the years there has been much fraudulent financial reporting as well as earnings management by corporations to benefit select members of the executive management at the expense of the stakeholders or to construe the public information about the financial performance of the corporations for specific ends (Healy & Wahlen, 1999; Schipper, 1989). Research has also shown that there is a very prevalent general view that corporate financial scandals and financial reporting frauds are a direct result of major weaknesses in the corporate governance of the corporations (Fich & Shivdasani, 2007). Another reason closely linked to the weakness of corporate governance in promoting financial fraud is the claim that frauds are also committed in the presence of a poor auditing committee and moreover, poor audit quality of the corporation (Rezaee, 2005; Lin & Hwang, 2010). In spite of research being carried out and steps for adequate corporate governance being taken such as the Sarbanes-Oxley Act being put in place, financial fraud still continues to persist in the United Kingdom and there are many recent charges as well, most notable being the $1 billion fine placed on Wells Fargo due to lending abuses as well as the charge of Elizabeth Holmes, CEO and founder of Theranos company at the young age of 19, for massive fraud (Michaels, 2018). The UK set up the Financial Fraud Action to counter financial fraud in the region and it publishes regular statistics which show that the amount of fraud has increased over previous years and costed the UK 2 million pounds each day in 2017 (FFA UK, 2017). A significant part of these frauds are financial reporting frauds carried out by individuals or groups of individuals to misappropriate funds for their personal gain, theft from the company assets, understate company losses to overstate the economic performance of the company as well as to show the company in a favorable light to attract investment (Beasley, 1996; Lin & Hwang, 2010). As is evident from the basic principle of how financial frauds work, these can be effectively mitigated by employing higher levels of audit quality in a corporation.

Thus, having ascertained the need for higher audit quality it is studied what impacts audit quality in a corporation and as mentioned earlier, it is to be established through examining historic literature how corporate governance through independence of the board of governance of corporations can provide that degree to audit quality. The greatest proponent for this claim is O' Sullivan (2000) who proposes just like Lin and Hwang (2010) that an independent board of directors can be the greatest measure of internal control and mediator between the agency costs and opportunistic management of the company as well as ultimately increase the quality of the audit of financial reports, thereby vindicating financial reporting frauds in the long run. However, this claim has not been satisfactorily and statistically tested and no adamant findings presented upon this hypothesis. Furthermore, there are specific caveats as to the hypothesis such as the size of the board has to be of the optimal level, as an unreasonable sized or small board would lead to what Mizruchi, an organisational theorist, calls the premise for managerial decision making where clever CEOs will gauge the temperaments of the board and act accordingly to capitalise on them and work for their own benefit (Mizruchi, 1983). This would in turn negatively impact the audit quality (Vafeas, 2005). These claims make this study even more pertinent as it aims to empirically analyse the relationship between independent board governance and increasing audit quality.

Research Objectives

This research aims to study the effect of board governance, specifically the independence of the board, on the quality and level of the financial audit of the corporations in the UK, carried out through the focus on the FTSE 100 companies listed on the London Stock Exchange. The research objectives aimed to be answered through the research have been listed as follows:

Q. What association is there between the degree of independence of the board and the level of audit quality?

Q. What association is there between the size of the board and the quality of the audit?

Rationale of the Research

Through the earliest available literature on corporate governance, researchers such as Eisenhardt (1989) and later theorists like Watkins, Hillison and Morecroft (2004) have been the biggest proponents of strong corporate governance and an independent board of directors to halt agency costs and use the agency theory to streamline the goals of the management with the stakeholders to not only better the economic performance of the company but in turn lead to higher accountability through increased audit quality as well. As the problem statement describes in detail how financial scandals have plagued the UK and lead companies to ruin and heavy fines, it stands to logic that financial misreporting for individual benefit must be restricted so that long-term growth and financial accountability can be established in corporations (Dechow, et al., 1996). Thus, greater audit quality is imperative to control earnings management and benefit all stakeholders in the UK companies. Therefore, this research will provide both theoretical and practical implications of the relationship between independent board governance and audit quality.

RESEARCH METHODOLOGY

Designing the optimal research methodology is of the utmost importance in a research study and without it the results lack the credibility which the research aims to establish. The accurate use of empirical data and statistical as well as qualitative analyses build the study to where it can actually benefit the intended subject and add value to existing research on it. The conventional research methodologies include meta-analysis, a systematic review of existing literature, experimental, semi-experimental as well as correlational and descriptive. A further classification of these research designs can be divided into flexible or fixed designs. These are classified according to the primary drive force of the research as in this case is a coupling of both theories driven as well as data-driven which makes it adequate to be sorted as a flexible research method design.

Furthermore, this section is categorised into subsections thoroughly detailing the different aspects of the methodology. Firstly, the research philosophy is discussed which is the very core of all research and by discussing the different forms, the philosophy used for this research is established. The second section details the measurement of the variables used in this research dealing with the identification of the quantitative markers of the variables as well as how they are measured. The third section builds a working operational model based on regression techniques to link the independent and the dependent variables into a relationship upon which the statistical analysis is centred. Fourthly, the method of data collection is briefed, and the last section explains the details of the statistical techniques used to test the hypotheses of the research.

Research Philosophy

This subsection on the different philosophies of research aims to bring to light the philosophy behind this particular research and hence, ascertains the reason for the use of the particular research approach in the following subsections. Debate on research has been on-going since the time of Aristotle and it has found its roots not only in science but in sociology and philosophy as well and after the years of debate, four main research philosophies have been agreed upon as the basic types of all research, namely, positivism, interpretivism, realism and pragmatism (Manhein, 1977). These research philosophies can also be linked to the four main types of knowledge known by the same four names and focus on the type of information as well as how it was collected which makes it fall under the different philosophies. Holden and Lynch therefore describe research philosophy as the source, nature and development of knowledge (Holden & Lynch, 2004). Pragmatism philosophy claims that there are many different realities based on the fact that there are many different truths which are different for individuals as the perception of each individual through the five senses is different. This means that there are different perceptions of the same reality, but these knowledge and truths are only relevant when they are supported by action (Johnson & Onwuegbuzie, 2004). Furthermore, this philosophy was formed the basis for the researchers proposing that a mixture of qualitative and quantitative techniques, better known as the mixed methods approach be developed as the lens to view research (Johnson & Onwuegbuzie, 2004).

While pragmatism incorporates both factual truths as well as experiential knowledge of individuals through their perception as part of the research observations, positivism only considers empirical facts and mathematically verifiable knowledge as part of the data observations (Morehouse & Maykut, 2002; Hirschman, 1986). Therefore, this ontological and atomistic view of positivistic research, statistical methods and analysis are imperative as part of this research philosophy. On the other side, realism is a form of philosophy based in epistemology and has the fundamental claim that the reality and the perception of reality in the human mind are two independent things (Hirschman, 1986; Holden & Lynch, 2004). It has two further subdivisions into critical and direct forms as well. While positivism and realism consider reality rather than the human input, interpretivism gives weightage to the social construction of ideas and knowledge which are a result of instruments, shared meaning, and consciousness and language. As this research form is inclusive of more than just factual but personal experiential knowledge as well, it is called qualitative research (Schwandt, 2000). Hence, keeping in view the earlier discussion both on prior literature as well as the different research philosophies, it would not be remiss to say that this particular research study leans more towards the quantitative and positivistic philosophy as it aims to build a correlation between variables that can be verified mathematically and proven.

Measurement of Variables

Dependent Variable

As is discussed in detail in the literature review, the dependent variable used in this research is the audit quality of the financial reporting in UK listed companies. There have been different markers used for identifying audit quality. This study uses the primary claim of O' Sullivan (2000) in measuring audit quality. This explains the relation of audit quality with audit fees from O' Sullivan (2000) which says that higher the audit fees, greater the audit quality. It has also been mentioned in the literature review how audit fees have been accurately used as a proxy for audit quality and increasing the audit fees does indeed lead to greater audit quality and internal controls through better financial reporting practices and restricting management rent extraction. Higher audit fees paid by the company decrease the auditor opportunism to collude with the management and hide material misstatement and thus lead to a superior audit (O'Sullivan, 2000).

While a lot of prior research has also used audit quality synonymously with the Big-Four proxy as an indicator of audit quality citing their reputation as the biggest claim to their audit quality, there are some drawbacks to that estimation as well and hence it is not used as an indicator in this research. Connett (2016) cites this very reputation and monopoly of the Big Four audit firms in their lax behaviour towards properly scrutinising illegal tax plans of client companies. Apart from their lax behaviour, it is also claimed that these Big-Four companies have actually provided tax avoidance plans to clients and the regulatory bodies which

were actually meant to police them have no say or authority over these firms due to the vast monopoly and dominance these firms enjoy both in the private and public sector, incurring favour with powerful entities on both sides (Connett, 2016). This makes the Big-Four a statistically risky factor as an indicator of audit quality and hence this research employs its own method grounded in established research such as O'Sullivan (2000) to use audit fees as the measure for the dependent variable of audit quality. That being said, it is also noted that the measurement of audit fees is indeed only a proxy for the variable of audit quality and the cost of audit provides a quantifiable measure which can be used to statistically test the claim of the research as per prior research and thus is used.

Independent Variables

The two main independent variables studied in this research are the independence of the board of directors and the size of the board respectively which are discussed as below.

Board Independence

The independence of the board of directors is closely linked to the number of non-executive, external directors currently sitting on the board. Therefore, the greater the independent directors of the board, the greater the collective independence of the board from the pressures of the management. This is also rooted in the fact that these directors have minimum to no claim in the company in the form of stock options or ties to the executive management which relieves them of agency costs and conflicts. However, it is to be noted that while all independent directors are only non-executive, all non-executive directors are not independent. Therefore, the indicator for measuring board independence used in prior research to work around this predicament of independence has been to take the percentage of independent directors on the board (Cotter, et al., 1997; Zhang & Yu, 2016). This means that the higher the percentage value, the higher the independence of the board.

Board Size

The board size as is evident from the name is measured by the total number of directors' present on the board (Eisenberg, et al., 1998; Elsayed, 2010; ElSayed et al., 2010). While there is no cap on the total number of members of the board, to avoid agency conflicts as mentioned in the literature review, a board size of six to nine members is considered optimal for this research study.

Control Variables

The use of these control variables ensures the adaptability as well as the applicability of the results and the method across not just this specific research but different scenarios and future research as well. The control variables used in this study are the firm size, the return on assets (ROA), the return on equity (ROE) and the financial leverage of the company.

Firm Size

Research has historically measured firm size through different indicators as there are various ways to ascertain the size of the firm, whether by their financial performance, or the number of employees or the total assets they possess. The most commonly used method however is the log of the total assets of the firm and this study uses this value as well.

Return on Assets

The return on assets provides a measure of how the assets are being converted into returns of the company. It is measured by the ratio of the total income and the total assets.

Return on Equity

The return on equity shows how the firm is translating the shareholder equity to revenue for the company. ROE is measured as the ratio between the total income and total equity.

Financial Leverage

Financial leverage is a measure of the company's proportion of debt to equity in the way it raises capital for operations. It is also referred to as the debt to equity ratio and as the name implies it is the total debt divided by the total equity of the company. An optimally leveraged firm can enjoy benefits like maximising returns while using less shareholder equity as well as a favourable tax shield as the debt interest expense is tax deductible. However, a highly leveraged firm also runs the risk of bankruptcy and insolvency in the event of non-repayment of debt.

Operational Model

The regression analysis for the study uses a panel data technique for which the operational equation is listed below:

$$AQ = \alpha + \beta_1 (B.Ind) + \beta_2 (B.Size) + \beta_3 (F.Size) + \beta_4 (ROA) + \beta_5 (ROE) + \beta_6 (LEV) \ldots eit$$

Where

AQ = audit quality, proxied by audit fees

B.Ind = board independence

B.Size = board size

F.Size = firm size

ROA = return on Assets

ROE = return on equity

LEV = financial leverage

Data Collection and Sample

As the research study is quantitative in nature, financial and empirical data needs to be collected. First and foremost is the financial data of the FTSE 100 index companies listed on the London Stock Exchange. This data is collected from secondary data sources such as online data repositories. The database in question used in this research particularly is the Thomson One Banker database part of the Thomson Reuters system. This database was used to collect the data for the financial variables of the study, leverage, audit fees, return on assets and return on equity. The data on the corporate

governance variables of board size and board independence measured through the proxy of independent directors on the board are collected through the primary data collection technique of reviewing the company annual reports available publicly in print and online on the company websites. The data was collected for the years 2012 till 2016. However, the companies in the 100-company stock index with finance related services, insurance, banking, fund management, investment companies etc. are excluded from the data as they treat high leverage differently which can be erroneous for the study (Fama & French, 1992). Another reason for the exclusion of financial firms is because their financial reporting style is also different from non-financial firms which risks the uniformity of the data and its findings.

Diagnostic Tests and Statistical Analysis

It is important to discuss the limitations of the ordinary least square regression method. Firstly, it exaggerates probabilities of Type I errors when the covariance and or variance structured data set is not compound symmetric (Ugrinowitsch, et al., 2004). OLS also ignores time-invariant covariates while panel data includes them as well. As this study includes both time-series as well as cross-sectional data, the use of panel data technique is more accurate. Furthermore, panel data analysis is able to deal with complex behavioural models, remove measurement errors, statistical biases as well as account for omitted variables. Hence it is used rather than OLS. The LM test is used to identify between pooled OLS and random effect after which the Hausman test is used to identify between fixed and random effect model. Moreover, due to the detection of autocorrelation and heteroscedasticity, this study employs the generalised least square (GLS) estimation. The following subsections go into detail on both fixed and random effect models as well as the GLS.

Fixed Effect and Random Effect Models

The fixed effect model can be applied when the observed data is non-random. The use of fixed effect model means that time independent effects for every entity will be imposed. The fixed effect model assumes that the individual specific effect is associated with the predictor variables. However, the random effect model is a type of hierarchical linear model and may also be referred to as a variance components model. The random effect model, contrary to the fixed effect model, assumes that the individual specific effects are not associated with the predictor variables. While the random effect model is more accurate than the fixed effect model, both models do not account for autocorrelation and heteroscedasticity issues.

Feasible Generalized Least Square

The Generalized Least Square method can be used when the residuals in the regression analysis are correlated. Opposite to the earlier methods, it in fact accounts for both autocorrelation and heteroscedasticity issues as well as unknown parameters. Thus, taking all research into consideration this study uses the feasible generalised least square method of regression analysis.

DATA ANALYSIS AND FINDINGS

Available Sample

The sample population consists of the whole FTSE 100 index companies irrespective of their industry. The sample is then shortened to 81 companies out of the 100-company index due to the other 19 companies being related to the financial services sector and industry which includes commercial banks, investment banks, mutual and hedge funds, insurance and leasing companies as well. The reason for the exclusion of these 19 financial companies is because these companies treat the level of financial leverage they have differently and such high levels may affect the sample readings and statistical analysis. Furthermore, the company of Ferguson Private Ltd, which even though is not related to the financial industry is not included due to the fact that the data for the variable of audit fee is not available for the years on the Thomson One Banker database. Henceforth, the sample upon which the statistical analysis is carried out is comprised of 80 non-financial companies taken from the FTSE 100 index for the years 2012 till 2016. As there are 80 companies and a 5-year period of data, the total observations are 400. This can be further shown through the following table.

Table 1 Sample Population

Total Companies	100
Financial Companies	19
Non-financial Companies	81
Data Unavailability	1
Statistical Sample	80
Time Period	2012-2016
Total Observations	400

Descriptive Statistics

This section describes the measures of central tendency and dispersion of the dependent, independent and control variables of the study. These will be explained with the help of relevant tables.

Table 2: Descriptive Statistics

						Skewness		Kurtosis	
	N	Min	Max	Mean	S.D.	Stat.	S.E.	Stat.	S.E.
AuditQ	400	0.20	2855.00	20.52	186.12	14.19	0.12	202.28	0.24
BSIZE	400	6.00	26.00	10.66	2.38	1.64	0.12	6.52	0.24
BIND	400	0.15	0.93	0.65	0.13	-0.58	0.12	0.95	0.24
SIZE	400	5.76	12.84	9.16	1.27	0.30	0.12	-0.03	0.24
ROA	400	-21.58	51.02	8.18	7.43	1.04	0.12	5.20	0.24
ROE	400	-2086.99	382.50	11.79	130.97	-11.48	0.12	172.30	0.24
LEV	400	-44.90	79.57	0.84	5.65	4.47	0.12	110.03	0.24

From table 3 it can be seen that the minimum amount paid as audit fees by the 80 companies throughout the 5-year period is £0.2 million and the highest paid amount is £2855 million. Similarly, it is also seen that the average audit fees paid during the period are £20.52 million. The data also confirms that the audit fees have been consistently increasing over the past years as the research by Allocca (2016) suggests. Another factor for the rise in fees is the fact that the majority of these listed companies utilise the services of the Big Four auditing firms and naturally they require increasing fees over time as well which consistently increases the fees paid by the companies as shown by the data.

The table further shows that the least amount of board members on the board of directors in a company in the sample is 6 which is in line with the guidelines from the literature review that there should be at least 6 members on the board. Furthermore, the most number of directors sitting on the board are 26 while the average number of board members is 10.66. Screening of the data further shows that the board size for the companies of the FTSE-100 index has steadily decreased over the years. The findings of this study of the average number of directors also agrees with the prior research of Spencer (2016) who researched that the average number of board members was 10.7.

The statistics for the independence of the board shows that the minimum level of independent directors of the board is 15 percent (0.15) while the maximum is 93 percent (0.93) and the average percentage of outside or independent directors on the boards is 65 percent. The UK Board Index also states that the top 150 companies of the United Kingdom have an average of 61.1 percent of independent directors (Allocca, 2016). This study shows that the FTSE 100 companies studied have a greater percentage of board independence than the top 150 companies.

Enakirerhi and Chijuka (2016) also conducted a study on the FTSE 100 companies and it is seen that the results of this particular study also closely resemble theirs in terms of the firm size. Some values of the return on assets and the return on equity are negative due to the losses faced by these companies in some years of operation which is shown as the minimum value in the table while the data trend shows that the majority of the companies were profitable in the period. The financial leverage marker also shows that while some companies scarcely rely on leveraging to finance their operations, some companies are highly leveraged as well. This can also be explained due to the difference in industry as some industries normally operate with high leveraging while others do not. Lastly, the table shows that the deviation from the mean is low for the size of the board, the independence of the board, the firm size and the return on assets while it is considerably high for the audit fees paid, the return on equity and the financial leverage.

Data Cleaning

Before a regression for the hypotheses testing can take place, data cleaning must take place which includes testing the standards of the multiple linear regression method such as the normality of the data, the autocorrelation, multicollinearity and the heteroscedasticity. The study also describes the outliers which have been removed from the analysis.

Outliers

As the name suggests, an outlier statistically is any reading which is not in line with the majority of the readings or is out of the norm. These can occur due to a multitude of reasons including but restricted to typographical errors. The inclusion of these outliers can lead to bias and error in the statistical analysis (Rocke & Woodruff, 1996). The statistical processes used to exclude the outliers from the data are the Mahalanobis distance, the Cook's distance and the centred leverage value techniques and these measurements are shown in the Table 4. As the Mahal. Distance excluded considerable observations from the analysis, it was not used and the other two techniques were applied and results used.

Table 3 Residual Statistics

	Minimum	Maximum	Mean	Std. Deviation	N
Mahal. Distance	0.122	293.322	5.985	18.225	396
Cook's Distance	0	0.095	0.002	0.006	396
Centered Leverage Value	0	0.743	0.015	0.046	396

Through the other two measures, 4 observations were identified as outliers and excluded from the study. Thus, as the table shows, the total number of observations included in the statistical analysis are 396. The Cook's distance value and Centred Leverage Value of 0.002 and 0.015 respectively show that the outliers excluded are not influential therefore their exclusion does not have any negative effect on the rest of the data analysis.

Normality

The normal distribution of the data is important for the statistical accuracy of the results of the regression of the data. If the data is not normally distributed, there can be many biases prevalent in the data which have not been addressed (Morgan, et al., 2004). Therefore, in such a case where there is no normality, historically it has been stated to use non-parametric tests (Corder & Foreman, 2014). However, it is also seen that the non-parametric tests are not a measure of certainty guaranteeing that the resultant data will have more accurate results and therefore this study adopts the method of transforming the non-normal variables to normal distribution. Furthermore, the non-normality is more urgent a cause of concern if the observations of the independent variable are less than 200 and since that is not the case here the non-normality can be ignored, and the dependent variable is normally distributed (Hair, et al., 2010).

The analysis of the table 3 confirms from the observation of kurtosis and skewness that the dependent variable of the audit quality is non-normal and to transform it into normal distribution the Box-Cox power transformation technique is applied. The dependent variable transformation through the power transformation technique used optical lambda of value -0.1. The following table shows the results of the transformation.

Table 4: Skewness and Kurtosis after Power Transformation

	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
AuditQ	-0.232	0.123	-0.745	0.245
BSIZE	1.635	0.123	6.432	0.245
BIND	-0.582	0.123	0.951	0.245
SIZE	0.307	0.123	-0.022	0.245
ROA	0.984	0.123	5.508	0.245
ROE	-5.460	0.123	57.929	0.245
Leverage	7.497	0.123	141.27	0.245

The standard error for both skewness and kurtosis shows that the values for the dependent and independent variables are in between -2 to +2 and therefore the non-normality is proved to be removed but there are control variables which still show non-normality, but it is assumed to be of no significant effect due to the total number of observations being adequate.

Multicollinearity

Multicollinearity is also a phenomenon which can affect the data set and lead to numerous biases. Through multicollinearity, the independent variables in a multivariate regression model have high correlation levels with each other. One research states that the second variable should not be analysed when just one variable will be adequate to assess the regression model and explain the variability (Fidell & Tabachnick, 2003). Measures such as the correlation matrix, tolerance values and VIF values are used to identify multicollinearity issues any of which are prevalent.

Table 5: Pearson Correlation

	AuditQ	BSIZE	BIND	SIZE	ROA	ROE
AuditQ	1					
BSIZE	.438**	1				
BIND	.246**	-.112*	1			
SIZE	.672**	.437**	.327**	1		
ROA	-.233**	-0.076	-0.028	-.345**	1	
ROE	-0.058	0.009	-0.011	-0.05	.294**	1
LEV	0.011	0.009	-0.019	0.02	-0.03	.451**

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 6: Collinearity Statistics

	Tolerance	VIF
BSIZE	0.725	1.380
BIND	0.798	1.253
SIZE	0.574	1.741
ROA	0.760	1.316
ROE	0.700	1.429
LEV	0.768	1.303

Multicollinearity is said to be an issue in the data set if the correlation between the variables is greater than 0.9. Fidell and Tabachnick (2003) further state that the tolerance value should be greater than 0.1 and the VIF value should be less than 10 to prove that the multicollinearity issue has been resolved. Table 6 and Table 7 show these results and it is evident that there is no bias of multicollinearity left.

Serial Correlation

Serial correlation or autocorrelation is a statistical measure of the scale of similarity between a particular time series data and its lagged form over sequential intervals. Durbin-Watson statistical techniques have been applied by prior research studies to remove biases caused by serial correlation. For there to be no bias of serial correlation, it is stated that there should be a Durbin-Watson score of 2 or close to 2. The result of the application of this technique shows that the data has a value of 2.004 which shows that there is no bias of serial correlation in this data set.

Heteroscedasticity

"Heteroscedasticity is a phenomenon in which changeability of a variable is imbalance or not equal across the series of value of other variable that predicts or estimate it" (Hair et al., 2010). If the scatterplot analysis shows that the residuals are scattered in any specific pattern, then it means that there is no homogeneity in the analysis. The scatterplot as seen in figure 1 shows that the residuals are scattered and hence there is no bias caused by heteroscedasticity.

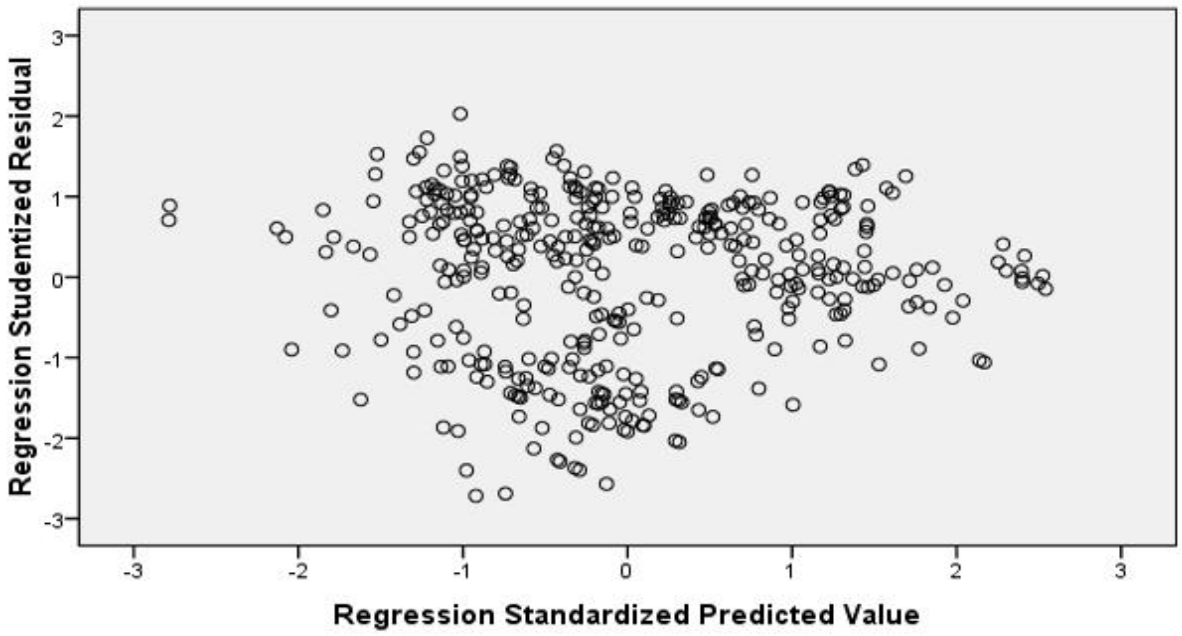

Figure 1: Heteroscedasticity Scatterplot

Regression Model and Hypothesis Testing

As has been seen from the methodology and the findings section, this research utilises and tests multiple panel data techniques to select the most favourable to be applied. The first and foremost technique applied is the pooled ordinary least square regression model which is shown in the next page in Table 8.

Table 7
Pooled OLS Regression

AuditT	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
BSIZE	0.095793	0.019571	4.89	0.000	0.057315	0.134271
BIND	0.782891	0.350791	2.23	0.026	0.093207	1.472574
SIZE	0.470344	0.041541	11.32	0.000	0.38867	0.552018
ROA	-0.0026	0.006298	-0.41	0.680	-0.01498	0.009786
ROE	-0.00046	0.000607	-0.76	0.447	-0.00165	0.000732
LEV	0.003089	0.008751	0.35	0.724	-0.01412	0.020294
cons	-4.66678	0.354714	-13.16	0.000	-5.36417	-3.96938

Table 8
Random Effects Model

AuditT	Coef.	Std. Err.	Z	P>z	[95% Conf.	Interval]
BSIZE	0.021362	0.013786	1.55	0.121	-0.00566	0.048382
BIND	0.167586	0.278759	0.6	0.548	-0.37877	0.713943
SIZE	0.533219	0.046255	11.53	0.000	0.442561	0.623877
ROA	-0.0034	0.003249	-1.05	0.295	-0.00977	0.002968
ROE	9.41E-05	0.000246	0.38	0.702	-0.00039	0.000577
LEV	-0.0028	0.003526	-0.79	0.427	-0.00971	0.00411
cons	-4.04267	0.445245	-9.08	0.000	-4.91533	-3.17

F (6, 389) = 61.14; $p < 0.01$ shows that the regression is significant and the observed goodness of fit shows that the selected variables account for approximately 49 percent variability in the dependent variable as R^2 is equal to 0.485. A β value of 0.096 and $p < 0.01$ for board size and β value of 0.783 with $p < 0.05$ for board independence show that there is a statistically significant and positive effect of these independent variables on the dependent variable of audit quality. However, observing the control variables, it is seen that only the firm size has a positive significant effect on the audit quality.

Next, the random effects model is applied to the data. This is shown in Table 9 as follows.

Wald $\chi 2 = 171.84$ and $p < 0.01$ shows that the overall results of the random effects model are significant, and the goodness of fit is R^2 is equal to 0.465. Nevertheless, this model does not show any significant relationship between the independent and dependent variables and the only variable which significantly affect the audit quality as per this model is the firm size. The Lagrange Multiplier test also assesses that the random effects model is preferable over the pooled OLS regression with $\chi 2 = 561.51$; $p < 0.01$.

The fixed effects model also shows similar results to the random effects model and is shown as follows.

Table 9
Fixed Effects Model

AuditT	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
BSIZE	0.011847	0.014463	0.82	0.413	-0.01661	0.040306
BIND	0.114065	0.296705	0.38	0.701	-0.46974	0.697874
SIZE	0.521734	0.058142	8.97	0.000	0.407331	0.636137
ROA	-0.00369	0.003313	-1.11	0.266	-0.01021	0.002825
ROE	0.00012	0.000247	0.48	0.628	-0.00037	0.000606
LEV	-0.00305	0.003532	-0.86	0.388	-0.01	0.003897
cons	-3.80369	0.558258	-6.81	0.000	-4.90215	-2.70524

F of (6,310) = 16.58 and $p < 0.01$ show significance and the goodness of fit is also similar to the above model at R^2 of 0.46. This model also shows that only the firm size has significant influence on audit quality and the rest do not have a significant influence.

As there are biases of serial correlation and heteroscedasticity in the data, this research applies the feasible generalised least square method to correct for that. This model is also concurrent with the earlier methods and a χ^2 value of 373.45 and p-value of less than 0.01 show that the model is significant. Furthermore, the model also shows that there is a positive and significant effect of board size and board independence on the audit quality contrary to the other models and on this basis the Hypothesis 1 is accepted, and Hypothesis 2 is rejected. This also shows that the other control variables do not have any significant effect on the audit quality of a company.

DISCUSSION

Auditing as an external accountability method and an internal control mechanism to increase the financial reporting quality and restrict management rent extraction has gained significant traction internationally through the years. Moreover, audit quality is claimed to be only increased in the presence of external or outside independent directors on the board and together these are said to be the tools of corporate governance which safeguard the shareholder as well as stakeholder rights. They are responsible for curtailing the self-serving attitude of the management as well as make sure that the majority shareholders do not overshadow the minority shareholders by increasing the financial reporting quality and the transparency as well as accountability within an organisation (Fama & Jensen, 1983; Jensen & Meckling, 1976). Therefore, greater audit quality leads to a stronger measure of corporate governance in an organisation.

The prior literature states that measures of corporate governance thus reduce agency costs between the management and the shareholders and increase mechanisms of internal control in the firm. The most important and greatly acclaimed part of corporate governance is board governance or more significantly, independent board governance which states that fundamentally independent directors on the board of directors of a company are responsible for strengthening the internal control systems and aligning the various interests of the management and shareholders (Baysinger & Hoskisson, 1990; Clarke, 2004). Thus, the independent directors on the board move towards increasing the audit quality in the organisation as a tool of internal control mechanisms by employing the use of and delegating more funds towards higher quality audit service engagements (Akhalumeh, et al., 2017; Beasley, et al., 2000). It is for this reason that this particular research study analyses and posits the relationship between the board size and board independence on the resultant audit quality in the organisations. Due to different theories of corporate governance in the prior literature, researchers have claimed different relationships between the board of directors and the level of internal control in the companies. While the agency theory constituted the main theory of corporate governance and painted the independent directors as reactionary in nature with a pessimistic view of the management, the rise of the resource dependence theory, the stewardship theory, etc. saw that the independent directors worked hand in hand with the management on strategic goals in order to increase the internal control and operational efficiency in the company (Beasley, et al., 2000; Donaldson, 1990a; Donaldson, 1990b; Adams, 1994; Fama & Jensen, 1983).

Fama and Jensen (1983) state under the agency theory that the audit quality is lowered in the presence of a large board of directors, whether independent or otherwise as the management has more leverage to influence the directors and get what they want, thus having a negative effect on the audit fee fund allocation and resultant audit quality. However, this research study and its findings claim the contrary to these previous findings grounded in agency theory. This study aligns itself more with the alternative theories of corporate governance by establishing that there is indeed a positive effect of the board size on the audit quality in the companies.

These findings are further in line with prior research such as Urhoghide and Izedonmi (2015) as well as Hamid and Abdullah (2012) who also claim that there is a positive relationship between the large size of the board and the higher degree of audit quality in the companies as they aim to protect the company repute in the industry. The board of directors are also responsible for securing external investment and making sure that the company stays afloat (Grace, et al., 1995).

Another aspect of the agency theory states that large boards will negatively impact the operation and strategic goals of the company over time due to the problem of free riding directors who do not care for the company however, if on the other hand these directors are resource-rich, efficient and committed, they would improve the company strategy and operability (Boyd, 1990). This viewed through the result of this study that the large board size has a positive effect on the audit quality thus suggests that the directors of the boards of the FTSE 100 companies analysed are therefore efficient and committed to improving the companies.

Hay and Knechel (2004) state that as the independent directors are responsible for strengthening internal control, securing external investment and protecting their reputation they delegate more funds for higher audit fees and quality to serve their duties. Fama and Jensen (1983) further claim that the directors carry out their two main roles of ratification and monitoring of the company. For the purpose of monitoring the organisation, the directors have to be impartial and thus independent from the organisation so that they protect the shareholder interests. The role of ratification is also a trait of both the independent as well as the internal directors elected from the executive management of the company. Both of these directors curtail the management rent extraction and restrict the agency costs. A further byproduct of the increase in audit quality is the resulting increase in transparency and accountability in the company. This research has shown that the general trend in the FTSE 100 companies is one of increasing board independence and audit quality which means that the level of transparency due to greater quality financial

reporting is also increased. Therefore, it can be posited that there is the presence of a transparent network of information in the UK stock market due to the majority of the companies having the positive relationship between board independence and audit quality (Zhang & Yu, 2016).

Hassan and Naser (2013) agree with the results of this study that larger firm size and larger board size have a positive effect on the delegation of funds for audit services while the financial standing of the firm such as the ROE and ROA do not have any effect. On the other hand, researchers such as Joshi and Al-Bastaki (2000) claim that there is indeed a relationship between the profitability of the firm and audit quality as more profitable firms are under greater scrutiny to show that they have earned revenue legally and in compliance with the standards, thus they spend more on audit services. However, this research does not support this claim as none of the regression analyses carried out show a positive significant relationship between the profitability and the audit quality of the company. The same is the case with the insignificant effect of the financial leverage on the audit quality in this study. While Zaman et al, (2011) state that the auditors charge greater premiums from highly leveraged firms as collateral for their services in ensuring that the companies do not face increased risks, this research does not point to the same evidence and is in line with Thinggaard and Kiertzner's (2008) claim.

CONCLUSION

Implications of the Study

This study has significant comparison value with the existing literature on the subject of corporate governance and also serves as a comprehensive review of the main themes and theories on the subject which define the role of the independent board of directors as a tool for strong corporate governance. It also analyses the prior literature claim that an independent board of directors positively influences the audit quality and hence the level of internal control and transparent financial reporting within an organisation. For this reason and through its comparability value, it seeks to substantiate the claims of research through its comprehensive statistical analyses as well as disprove the other claims.

In this regard, this research focuses on the capital market in the UK and hence provides important insights into the workings of the organisations in this market which is of great implication for academics, policymakers as well as businesses. It proves in the context of the FTSE 100 companies in the UK that the independent board of directors and the size of their board indeed lead to greater corporate governance through increasing internal control by prioritising audit quality greatly. It further evidences the primary claim of the research conducted by O'Sullivan (2000) that the independence of the board of directors should be increased in the United Kingdom as these directors safeguard the stakeholder rights and eliminate agency conflicts through increasing the audit quality.

Limitations

As is the case with all research, this study too has its own set of specific limitations which are outlined herein. These are related to the validation of the findings of the statistical analysis as well as to the study in general.

- The study originally opted to increase the time period of the data analysis from the five years (2012-2016) by adding the year of 2017 for even more relevant and latest results but due to the time constraint and need for extensive data cleaning techniques in addition to the fact that particular control variable data, namely, the board size and board independence is not available on the university Thomson One Banker database which would mean that it would have to be procured through other channels which was in turn not possible given the time constraint.
- As this study takes the data sample from one single country, the United Kingdom, its generalisability is also limited to this one country and perhaps to other developed countries with similar reporting and capital market standards.
- This study used audit fees as a proxy for the audit quality due to the ease of availability and applicability in the quantitative statistical analysis however, it is not to be missed that there are other historic measures of audit quality as well which may provide different results.
- Thus it is to be noted that there are limitations to using the cost of audit as a measure of the audit quality as well, as there may be other factors which influence the audit quality or the audit outcome more than the fees paid which in turn may cause the resultant audit quality to not be directly related to the cost of the audit.
- This study has focused only on-board governance as the tool for corporate governance and does not include any other measure of corporate governance in assessing the relationship between the board governance and the resulting audit quality. Moreover, the statistical analysis does not include a relationship between the audit fees and the level of earnings management, so it is not quantitatively evidenced in this research and only theorised in the literature review as per prior research. This also weakens the relationship between the cost of the audit engagement and the resultant audit quality as there may be other variables depending upon company case to case which still affect the audit quality even though greater audit fees are paid but these relationships are not statistically tested or identified in this research.
- As the majority of the firms listed on the FTSE 100 stock already do use the services provided by the Big Four accounting firms, this can also create bias as the analysis is restricted to the audit services of these firms.
- The control variables used in this study are firm-specific and the analysis does not take in to account macroeconomic factors or industry level factors which may have an impact on the study.

Future Recommendations

This study holds the potential to also form the basis for future research on the subject and thus for this reason provides

recommendations for future academics and researchers to pursue their studies in this regard.

- In the absence of a short timeframe, the study can be expanded to analyse the FTSE 350 stock index companies or the FTSE All-Share companies so that a much larger data set can be procured and the effect of the variables studied in even greater detail and accuracy.
- The time frame may be increased to long-term analysis such as a ten-year period for greater reliability in the panel data analysis.
- Industry level analysis may also be carried out with the classification and separate analysis of small cap, medium cap and large-cap companies to assess the relationship within these different classes. The data may also be expanded to include companies from other European countries so that the research has greater generalizability of the results.
- Future studies may also consider the effects of other corporate governance measures such as ownership structures, ownership concentration, CEO characteristics, audit committee characteristics and other measures on audit quality.
- The use of the feasible generalised least square model does not correct for biases that may be present in the data due to endogeneity or simultaneity and thus future studies may incorporate a simultaneous equation which tests other variables as well with the two-stage least square model or the generalised method of moment regression.

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