
Internal corporate governance mechanisms and financial performance: evidence from the UK's top FTSE 100 listed companies

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Abstract: This paper examines the relationship between internal corporate governance mechanisms and the financial performance of the UK's top FTSE 100 firms listed on the London Stock Exchange. By using a sample of 59 firms from the top FTSE 100 firms over the period from 2013 to 2018, our findings demonstrated that the lower number of board size and independent directors on the board, the better financial performance of the UK's top FTSE 100 listed firms. However, our study revealed that better financial performance is positively correlated with greater proportion of women on boards. Additionally, we found that board meeting is insignificantly associated with the financial performance of listed firms. This study has important implications for policy makers in the UK to have more women on boards and to decrease board size and the number of independent directors to the optimal size, since there is no one size fits all firms.

Keywords: corporate governance mechanisms; financial performance; board size; board meeting; board independence; women on boards; UK.

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1 Introduction

An increasing attention has been concentrated on the topic of corporate governance due to concern about the standard of accountability and transparency in financial reporting. This resulted in various reports being published to improve corporate governance codes (Cadbury, 1992; Hampel, 1998; Greenbury, 1995). In response to the number of high-profile corporate failures in the UK, such as Polly Peck, good governance codes became required to enhance transparency and accountability within the structure, operations and monitoring role of the board. Furthermore, the UK governance system has gained an increasing demand and led to the amendment of the UK governance codes over the past years (Weir and Laing, 2001).

A company's corporate governance is a vital criterion to today's market participants, investor because it is considered an important for making investment decisions. Investors would consider paying a premium for corporations with an effective governance system (Newell and Wilson, 2002). The UK corporate governance codes allow flexibility in its application through the 'comply' or 'explain', although alternative to complying is to be justified (Sergakis, 2015). Moreover, a fiduciary relationship exists between the agent (directors) and the principles (shareholders) of a company, which need to be built and maintained for an effective relation and success in the long run. The success of this relationship is highly dependent on building it on the foundation of confidence, respect and mutual benefit between both parties (Jensen and Meckling 1976). The governance of a company is a responsible of the directors, who are to ensure an effective system in put in place, accountability and transparency within the relationship between the companies and its shareholders. While the shareholder of a company is to appoint the auditors, directors and ensure the instalment an effective governance structure (Goergen et al., 2006).

According to Council (2010), the new UK corporate governance codes issued in 2018 comprises of various provision and codes, which are detailed as follows. Firstly, the code states that at least half of the board should be occupied by non-executive directors classified as independent. This is to ensure that the decision-making process of the board is not influenced by one individual or small group of individuals. Another provision mentions the role of the nomination committee on the polices for gender diversity of the higher-level management of the board should be detailed within the annual reports, to encourage greater gender diversity.

Accordingly, the FTSE 100 companies undergoes pressure from regulators and markets, as the biggest 100 companies in the UK by market capitalisation. These companies can be stated as those who set the standards, which other companies follow, therefore lead to the increasingly probability of disclosure amongst these firms (Rajab and Schachler, 2009). Consequently, this study focuses on the effectiveness of the internal corporate governance mechanisms within the FTSE 100 companies and the impact these has on its financial performance. Overall, this paper purposes to contribute to policy makers' understanding of what an effective corporate governance, which induces higher performance entails.

The main reason for conducting this study is to fill the current gaps in the literature and to emphasise the importance of addressing those gaps. After the most recent financial crisis of 2007–2008, corporate governance mechanisms are widely applied to evaluate and enhance the efficiency of corporate performance, which can be measured by using different financial analysis ratios. Although many scholars tried to answer these

questions, but the evidence to address these questions is still ambiguous. Specifically, it is still controversial to clarify which corporate governance mechanism can lead to improve certain firm performance indicators or influence certain profitability ratio. Empirically, some scholars have studied the impact of corporate governance mechanisms on return on assets (ROA) ratio of firms operating in the UK and they have collected data up to 2009, and they found mixed results (Page, 2009; Gupta et al., 2009; Guest, 2009; Akbar et al., 2016). Furthermore, very few studies tried to examine the association between corporate governance mechanisms and the earnings per share (EPS) of firms operating in the UK (Iqbal and Strong, 2010). This study, therefore, attempts to extend the previous research conducted to examine the relationship between internal corporate governance mechanisms and the financial performance of the UK's top FTSE 100 listed firms measured by return of asset (ROA) and EPS. Moreover, our study has employed the most recent time period from 2013 to 2018 with a view to examine the latest influence of certain CG mechanisms on the profitability ratios of firms listed on LSE.

This paper, therefore, provides great contribution to previous literature on this topic through filling gaps in the research on the top FTSE 100 firms. First, there is inadequate amount of research on the effect of corporate governance on the financial performance on the UK top FTSE 100 firms (Müller, 2014; McCann and Wheeler, 2011). Secondly, there are relatively few recent empirical research papers on the top FTSE 100 that were applied most recent data (Long, 2007; Francoeur et al., 2008). Therefore, we extended our time horizon to include most recent time period spanning 2013–2018. Finally, this research contributes to the current literature by using an alternative measure of financial performance, namely EPS ratio, which has had no attention in the previous governance literature conducted about the UK.

The remainder of this paper is structured as follows. Firstly, background and the importance of testing the past governance mechanisms on the past financial performance of listed firms, which outlined in Section 2. Secondly, the review of theoretical and empirical literature is constructed and discussed in Section 3. Thirdly, research methodology and research design are reported in Section 4. Fourthly, the findings and discussion are both discussed in Section 5. Finally, conclusion, implications and suggestions for future research are outlined in Section 6.

2 Background

Capital market reforms can significantly lead to impact the financial performance of all listed firms (Shirai, 2004). Therefore, corporate governance practices have been primarily used to assess the effectiveness of corporate governance reforms issued in a country, which in turn impact the financial performance of listed firms (Goel, 2018). This is because good governance practices reduce risk for investors, improves financial performance and helps in attracting more investors (Spanos, 2005). Therefore, Cuervo (2002) outlined that it is necessary to apply effective corporate governance mechanisms to ensure the maximisation of firm value rather than promoting codes of good governance issued in a country. Accordingly, it is true to say that accounting-based indicators, such as (ROA and EPS) can be used to measure and reflect the past financial performance of listed companies, while market-based indicators, such as (Tobin's Q ratio and market-to-book value ratio) can help to anticipate the future financial performance of

listed companies (Al-Matari et al., 2014). Despite prior studies used some aspects of the accounting-based measures, findings are still inconclusive, since some scholars found a positive relationship, while others revealed a negative relationship between corporate governance and firm performance. Consequently, this study applied two accounting-based indicators to measure the relationship between financial performance of listed firms in the UK and their internal corporate governance mechanisms, which is still ambiguous.

Corporate financial scandals, such as WorldCom and Enron resulted in the increase attention corporate governance received and the introduction of the Sarbanes-Oxley Act of 2002 (Byrnes et al., 2003). These high-profile scandals accentuated the importance of incorporating good corporate governance as this could have a detrimental effect on a firm's value (Gompers et al., 2003; Bebchuk et al., 2008).

The term corporate governance has been defined in several varying forms, suggesting lack of consensus on a definite definition. Corporate governance has been explained as a system, structure and process adopted by a company, influencing the direction and control of the company (Page and Spira, 2016). Likewise, Choudhury and Alam (2013) declared that corporate governance directs the internal integrity of a company, in terms of its legal and organisational structure. Alternatively, Shleifer and Vishny (1997) defines corporate governance as a mechanism implemented by the investors of a firm, to ensure a return on their investments.

Accordingly, corporate governance is concerned about the relationship between the various stakeholders of a company such as, directors and shareholders. Whereby the directors (agents) run the company on behalf of the shareholders (principal) (Goergen et al., 2006). The dynamic of this relationship causes the segregation of ownership from control, so firms aim to sustain the relationship through ensure whether good corporate governance codes are established and implemented to enhance corporate performance (Nazir and Afza, 2018).

3 Theoretical and empirical literature

This section discusses the theoretical and empirical literature used to examine the association between internal corporate governance mechanisms and financial performance of companies.

3.1 Theoretical framework

Several theories have been developed by the various academic exploring corporate governance, and these theories shaped the connotative meaning of this phrase. These theories include stakeholder, stewardship, political, resource dependency, political, agency and transaction cost theories (Cheffins, 2013). In this paper, we apply two major governance theories: agency and stewardship theories to analyse the findings of this study.

3.1.1 Agency theory

Agency theory is the most used framework to explore the relationship between corporate governance and the financial performance of a company. Agency theory is rooted in

demonstrating the relationship between the shareholders and directors of the company. Whereby, decision-making power is exercised by the agent on behalf of the principle (Jensen and Meckling, 1976). Agency theory describes directors (agents) as opportunistic, guided by self-interest and not cautioned about the wealth of the principle in the same way as the principle. Therefore, the separation of ownership from control, accompanied with a lack of aligned goal causes agency problems and conflict of interest (Bonazzi and Islam, 2007) is inevitable. Consequently, Fama and Jensen (1983) exclaim that company would gain from incorporating good corporate principles as it reduces corporate governance problems.

Moreover, from an agency theory point of view, corporate governance entails creating and assessing the mechanisms incorporated by shareholders to control firm's insiders, reduce agency loss and ensure shareholder's wealth is maximised (Adegbite, 2012). Likewise, Millstein (1993) explains corporate governance as a mechanism in which a company uses to monitor corporate actions, agents and assets, ensuring that corporate objectives are achieved, shareholders wealth and corporate profit is maximised.

Therefore, agency theory shows that companies with weaker governance systems incur greater agency issue, leading to a lower financial performance for companies (Core et al., 1999). However, agency theory endures limitations due to generalising the motive of manager to one that causes disagreements between agents and principals (Macey and O'Hara, 2003), and places extensive emphasis on the agent, with no emphasis on the principal (Boston et al., 1996).

3.1.2 Stewardship theory

The stewardship theory contrasts with the agency theory because it places less emphasis on the perspective of individualism, rather empathises non-economic factors that guides managerial activities, such as the need for recognition (Mason et al., 2007). The foundation of this theory pinpoints the culture of trust which exists between manager and financiers (Mason et al., 2007). This means that managers as stewards are not led by self-interest, but instead work hard to achieve high profit target and shareholders' return (Donaldson and Davis, 1994).

According to stewardship theory, corporate governance enables the understanding and comprehension of the role of the agent. The stewardship theory defines corporate governance relates to hierarchy (Davis et al., 1997). Stewardship theory assumes that managers are inspired by accomplishing high targets even if its detriment their own interests (Donaldson and Davis, 1994). Consequently, the aim of corporate governance should be on empowering managers to enhance efficiency rather than on motivation (Donaldson and Davis, 1991). However, stewardship theory has some limitations because it generalises managers intentions as having integrity, high moral and aim to maximise corporate performance (Fox and Hamilton, 1994), and it suggests that there is no conflict of interest between the principal and agent (Hung, 1998).

3.2 Empirical literature

There are several corporate governance mechanisms that have been included in the previous empirical studies. These internal mechanisms include board size, board meeting, ownership structure, board independence, and women on the board, some of which is detailed below.

3.2.1 Board size

The size of the board explains the number of directors with the board of a company. Coles et al. (2008) states that board size of important to the effectiveness of the board because of the diverse expertise individuals can add to the quality of decision-making. However, board with larger sizes has been linked to reduced ability to control management by the board, increased issues with communication leading to agency problems (Jensen, 1993; Yermack, 1996). Additionally, small size boards are highly valued by the stock markets (Yermack, 1996).

Heidrick & Struggles (2007) showed that board size varies between countries. Germany, Belgium and France usually have a larger board of between 14 and 20, meanwhile smaller board exists in Switzerland, the UK and Netherlands. The optimal board size has not been generally agreed upon. Lipton and Lorsch (1992) states that the optimal board size is between eight and nine directors, while Jensen (1993) suggest between seven and eight directors. While Coles et al. (2008) argued that the optimal board size differ between companies, Conger and Lawler (2009) argued that an optimal board size does not exist as the size should depend on the effectiveness on the board's operations.

Moreover, the various research on the impact of board size of the financial performance of a company concluded on conflicting results. A research paper demonstrated that there is a positive association between board size and company performance (Dalton et al., 1999). Some prior empirical research has showed that the number of directors in the board have a significant influence on the financial performance of listed companies (Haniffa and Hudaib, 2006; Bhatt and Bhattacharya, 2015; Afrifa and Tauringana, 2015). While, García-Ramos and García-Olalla (2011) found a positive correlation between them in non-founder-led companies.

Dissimilarly, other research demonstrated that board with larger sizes are problematic and had a negative impact on corporate performance. Guest (2009), Cheng (2008) and Yermack (1996) found this true through using the UK, Bangladesh and the USA firms between the periods 1981 and 2015. The agreement of larger boards being problematic is based around the fact that larger groups induces inaccuracies within decision-making (Stiglitz, 1991) and issues associated with poor communication and difficulties to arrange board meetings, which reduces the effectiveness in decision-making (Jensen, 1993). Additionally, Lipton and Lorsch (1992) stated that free-rider issues increases with board size because the diligence of directors is less likely to be exercised. Alternatively, Garba and Abubakar (2014) discovered an insignificant association between them. Hence, the above discussion lead to the following hypothesis:

H1 Financial performance of a company is negatively associated with the board size.

3.2.2 Board meetings

The board meeting is an activity that allows the directors of the company to increase their control and knowledge of the strategy of the company and undertake the monitoring role (Shivdasani and Zenner, 2004). The frequency of the board meetings is related with corporate governance, consistent with agency theory and is a vital aspect of the board's operations. This attribute of the board has received increase discrepancy by regulators and shareholder, which lead to a more routine report about the number of annual meetings held by the company. Although board meeting is an important aspect of the

board operations for enhancing the effectiveness of the board (Adams and Ferreira, 2007), the associate that it has with the financial performance of the company is still not clear.

Board meeting has been decided to be beneficial to shareholders, although the nature of the association between the firm performance and number of board meeting is concluded to be complex. Lipton and Lorsch (1992) declares that the share issue shared by directors is the lack of enough time to perform their duties. Therefore, board meeting time is an important resource in enhancing the effectiveness of the board (Conger et al., 1998). Contrastingly, Jensen (1993) suggested that the board should remain relatively inactive because increasing the board meeting is not necessarily useful as majority of the time is absorbed by routine task, reducing the chance for an effective board meeting. Therefore, the number of board meeting has a positive relation to the performance of previous years (Ntim and Osei 2011). However, Brick and Chidambaran (2010) using US firms between 1999 and 2005, argues that board meeting has a negative association with the financial performance of the firm's prior years.

A more recent study conducted by García-Ramos and García-Olalla (2011) highlighted that a company's financial performance improves as the number of board meeting increases, through analysing European companies. Meanwhile, Bhatt and Bhattacharya (2015) reported that there is no relationship between the number of board meetings and financial performance of a company, using Indian firms during the periods 2006 and 2012. Moreover, Jackling and Johl (2009) discovered that the consistency of board meetings has an insignificant relationship with the financial performance of a company. Naseem et al. (2017) uncovered this true through using Pakistan listed firms. Hence, the discussion above leads to this hypothesis:

H2 Financial performance of a company is negatively related to the number of board meetings.

3.2.3 Independent directors

Corporate governance codes should include the requirement for the board to incorporate independent directors within the company's board (Jackling and Johl, 2009). It is essential that the FTSE firms have at least half of the board consisting of independent directors. The need for this is rooted within agency theory (Dalton et al., 1999). This theory proposes that the conflict of interest between the principal and agent (Fama and Jensen, 1983), can be demolished with the presence of independent directors. Furthermore, Dalton et al. (1999) recommends that for the board to be effective, most of the board should be independent.

Alternatively, stewardship theory assumes that for high financial performance, greater amounts of insider directors are essential because of the benefits gained from their familiarity to the business operations, which leads to better decision-making (Muth and Donaldson, 1998). Similarly, Bozec (2005) mentions that the information of the independent directors is limited because of working part-time, hence causes the negative impact on the corporate financial performance.

Furthermore, the association between the financial performance and independence of the company has been analysed by several research and indicated inconclusive findings (Bhagat and Black, 2001; Jackling and Johl, 2009). For example, prior research

concluded that there is a significant positive relationship through using US and Indian firms between the period 1970 and 2018 (Baysinger and Butler, 1985; Millstein and MacAvory, 1998; Coles et al., 2008; Arora and Bodhanwala, 2018). While Djerbi and Anis (2015) illustrated this result by using the company's risk of French firms as a basis of comparison between the period 1999 and 2007.

Additionally, a limited studied has indicated a negative association between the number of independent directors on the company's board and its financial performance. Agrawal and Knoeber (1996) and Coles et al. (2001) have confirmed this statement through using US firms. Meanwhile, Dalton et al. (2007) conducting a meta-analysis of 54 empirical studies and Vafeas and Theodorou (1998) used the UK firms to show that there is no significant relationship between board independence and performance. Hence, the above discussion leads to this hypothesis:

H3 Financial performance of a company is positively associated with greater proportions of independent directors on the board.

3.2.4 Number of women on the board

Board gender diversity have gained an increasing amount of attention from the public in more recent year, which heightened the demand by stakeholder for information about gender diversity performance (Miles, 2011). The number of women with corporate board has grown, although these numbers varies between firms, industries and countries (Brammer et al., 2007; Wellalage and Locke, 2013; Paweenawat, 2019). The increase experienced could be due to the positive signals' addition of more females to the board projects to investors.

Davies (2011) accentuated the importance of board diversity as it promotes greater knowledge, experience and skills, as firm obtain higher performance when top people from a range of personal characteristics are recruited. Agency theory scholars proposed that female directors are important to minimising agency cost, due to the advantage gained from bringing new insights to the board and when making complex decisions (Westphal and Milton, 2000). Ararat et al. (2015) also mentioned that there is a positive influence when women are present in the board because the increase intensity of the board monitoring role, which has a great impact on the financial performance of a company.

Majority of previous research on the relationship between the number of women within the board of the company's and financial performance uncovered a positive relationship. Previous studies illustrated that by using US, Spanish, Turkish and FTSE 350 firms during the periods between 1992 and 2013 (Campbell and Miguez-Vera, 2008; Dezsö and Ross, 2012; Perryman et al., 2016; Farag and Mallin, 2017; Ararat et al., 2015). On the other hand, Bohren and Strom (2010) found a negative association between greater gender diversity and financial performance of a company using Norwegian firms during the periods 1989 and 2002. Moreover, other scholars discovered that there is insignificant association between women on board and financial performance by using UK FTSE 100, Fortune 500, Danish and Madrid-listed firms between 1998 and 2006 (Rose, 2007; Miller and Triana, 2009; Haslam et al., 2010; Gallego-Álvarez et al., 2010).

The mixed results highlighted above showcases that the advantage gained from having a greater proportion of women with a company's board has on the financial

performance of a company is not clear (Maury, 2006). Altogether, the discussion above led to this hypothesis:

- H4 Financial performance of a company is positively related to higher proportions of women on the board.

3.2.5 Corporate governance and financial performance

Academic denoted that the research on corporate governance and financial performance of a company is complex (Fogel and Geier, 2007; Dalton and Dalton, 2011; McGuire et al., 2012). Although several studies have been able to explore this relationship (Bebchuk et al., 2008; Bhagat and Bolton, 2008), but varying conclusion were made by other scholars (Fogel and Geier 2007; Dalton and Dalton, 2011; McGuire et al., 2012).

Larcker et al. (2007) and Paniagua et al. (2018) illustrated a positive relationship between the governance system of a company and its financial performance. Hutchinson (2002) discovered a negative correlation. Similarly, Bauer et al. (2004) found a negative relationship whilst using earnings-based performance ratios to measure the company's financial performance. However, Vafeas and Theodorou (1998), Agrawal and Knoeber (1996) and Prevost et al. (2002) discovered that there is insignificant relationship between them.

Consequently, there is no consensus on the appropriate measure for corporate financial performance (Dalton and Dalton, 2011). This led to research using various performance indicator measurements, such as profit margin, ROA, return of equity (ROE) and Tobin's Q ratio. The most used financial measurement is ROA (Core et al., 1999; Bhagat and Bolton, 2008; Brick and Chidambaran, 2010). ROE is also common in previous research papers conducted on corporate governance (Kajola, 2008; Bauer et al., 2004; Paniagua et al., 2018). Whilst both ROE and ROA has been incorporated in most research paper, EPS had gained little attention. Consequently, we used ROA in addition to EPS as indicators to measure the financial performance of the top UK's FTSE 100 firms.

4 Research methodology

This section described the research methodology adopted to achieve the research objectives and answer the research questions. Specifically, this section discusses the research design, sampling, data collection, data analysis and variables measurement and model specification.

4.1 Sampling and data collection

The sample size for our research included 59 firms of the top 100 companies listed on the London Stock Exchange. This sample was selected through utilising probability sampling techniques known as convenience sampling. The sample size chosen eliminated firm with data that is not available/missing because there was lack of available information necessary for this research. This is consistent with the method used by another research on this topic (Yasser et al., 2017; Kagzi and Guha, 2018). Moreover, more than 50% of

the sample population of the FTSE 100 companies is represented in the data collected, which increases the generalisability and validity of this research.

The time horizon for our research covers the period between 2013 and 2018. This time frame is consistent with previous studies (Bhatt and Bhattacharya, 2015; Mathew et al., 2016), and it enables a longitudinal study of the variable whilst increasing the reliability of the results. A data collected from 2013 allows the extension of prior research on this research topic area. Additionally, this research used the FTSE 100 as there is limited research in this topic for UK listed firms (Vafeas and Theodorou, 1998; Guest, 2009; Müller, 2014; Afrifa and Tauringana 2015).

4.2 Measurement of variables

This section provides information about the independent and dependent variables included in our regression models to examine the association between good governance mechanisms and corporate performance of the UK top FTSE 100 firms.

4.2.1 Dependent variables

As demonstrated in Section 2, there is a lack of consensus on the most suited financial performance measurement, which lead to the adoption of various performance measurement methods used in prior research (Bhatt and Bhattacharya, 2015; Yasser et al., 2017; Paniagua et al., 2018). Although only a limited amount of research utilised the use of EPS as a performance measurement. Hence, this research aims to incorporate EPS as a dependent variable to measure financial performance. Implementing both ROA and EPS enables a broader approach to the empirical analysis.

ROA can be described as a profitability measurement, which showcases how effectively a company uses its asset to generate revenue. Following Yasser et al. (2017) and Chou et al. (2013), ROA is measured through dividing net income with the total asset of a company for the same fiscal period. Moreover, EPS can be defines as an indicator of how profitable a company is, and the percentage of company's profit allocated to each outstanding share of stock at the end the fiscal year. Consistent with Chou et al. (2013), this variable is calculated through dividing the net income with the number of outstanding shares. Accordingly, dependent variables outlined above were chosen because of the available data on financial performance. Furthermore, there is a lack of research on EPS as an indicator for financial performance of the top UK FTSE 100 firms.

4.2.2 Independent variables

Consistent with prior research (Coles et al., 2008; Mangena et al., 2012; Bhatt and Bhattacharya, 2015), corporate governance mechanisms for our research were measured by using four mechanisms, namely board size, board independence, board composition of women and board meetings. These four internal corporate governance mechanisms were chosen due to limited availability of data on other corporate governance components, such as CEO-duality.

Firstly, the size of the board is described as the sum of directors within the board of a company. In line Bhatt and Bhattacharya (2015) and Müller (2014), board size is measured by total number of directors on the board of a company. Secondly, the independence of the board refers to the total sum of directors within a company's board,

who are classified as independent. Consistent with Müller (2014), Johl et al. (2015) and Yasser et al. (2017), board independence is calculated by measuring the proportion of independent directors to the total number of board directors. Thirdly, the number of meeting held by the board refers to the total sum of meeting held by a company's board within a fiscal year. Consistent with Brick and Chidambaran (2010), McCann (2016), Chou et al. (2013) and Bhatt and Bhattacharya (2015), this variable is calculated by the number of board meetings held during the year. Finally, the board composition of women relates to the proportion of women within the board of the company. Consistent with Müller (2014) and Solakoglu and Demir (2016), board composition of women is measured by the proportion of women on the board compare to the total number of directors on the board. Table 1 shows the measurement of all variables included in this empirical study.

Table 1 Variable measurements

<i>Variables</i>	<i>Measurement</i>
The size of the board	Total number of directors on the board
Number of board meetings	Total number of board meetings for the year
Number of independent directors on the board	Proportion of independent directors to the total number of directors on the board
Board composition of women	Proportion of women on the board to the total number of board of directors
Earnings per share (£)	$\frac{\text{Net income}}{\text{Number of outstanding shares}}$
Return on assets (%)	$\frac{\text{Net income}}{\text{Total assets}} \times 100$
Firm size	The natural log of total assets
Type of industry	Financial and non-financial industry

4.2.3 Control variables

We have applied two control variables, namely firm size (total assets) and type of industry (financial vs. non-financial companies), which are held constant in order to assess the relationship between multiple dependent and independent variables. Consistent with prior studies, our study uses control variables to examine the impact of certain characteristics of firms on both their financial performance and corporate governance mechanisms (Dzingai and Fakoya, 2017; Munisi and Randoy, 2013; Shawtari et al., 2016). We use the natural log of total assets as a proxy for the firm size. While, we used the type of industry financial versus non-financial companies as a proxy to control for the performance of firms listed on the LSE.

4.3 Data analysis techniques

The secondary data needed to conduct this study are used to test the relationship between different corporate governance mechanism and the financial performance of the FTSE 100 companies, which were collected from different reliable secondary sources.

These sources include annual reports and Bloomberg annual reports, which enables greater credibility and reliability. Spencer Stuart UK board index data are also used for data collection. This source is consistent with Müller (2014), therefore promotes the credibility and reliability of the dataset. We used SPSS and Stata Software to analyse the information gathered. On SPSS, the data is tested for normality (which it satisfied) and outliers are eliminated. Then, correlation analysis and multiple regression analyses were performed using SPSS software.

This research is purely a quantitative study, which relies on deductive design to prove the causative relationship between the different corporate governance mechanisms and the financial performance of FTSE 100 firms. Statistical analytical methods are used to determine the relationship between the variable, ratify the data and test the hypothesis. The statistical models include; descriptive analysis used to summaries the dataset (Johl et al., 2015; Yasser et al., 2017), multivariate OLS regression and Pearson correlation analysis used to examine the relationship between the variables, which is consistent with previous research (Bhatt and Bhattacharya, 2015; Naseem et al., 2017; Paniagua et al., 2018). This is because multiple linear regression can be statistically applied if there is only one single continuous dependent variable with multiple continuous or categorical explanatory variables (Allua and Thompson, 2009). Accordingly, the OLS regression equations (1) and (2) have been run as presented below to investigate the relation between governance mechanisms and the financial performance of the top UK FTSE 100 firms.

$$ROA_{it} = \alpha_0 + \beta_1 BZ_{it} + \beta_2 BM_{it} + \beta_3 ID_{it} + \beta_4 WB_{it} + Controls + \varepsilon_{it} \quad (1)$$

$$EPS_{it} = \alpha_0 + \beta_1 BZ_{it} + \beta_2 BM_{it} + \beta_3 ID_{it} + \beta_4 WB_{it} + Controls + \varepsilon_{it} \quad (2)$$

Table 2 Variables definitions of all variables included in the regression models

BZ_{it}	The size of the board for a company (i) in a year (t)
BM_{it}	Number of board meetings for a company (i) in a year (t)
ID_{it}	Number of independent directors on the board for a company (i) in a year (t)
WB_{it}	Number of women on board for a company (i) in a year (t)
ROA_{it}	Return on assets for a company (i) in a year (t)
EPS_{it}	Earnings per share for a company (i) in a year (t)
$Controls_{it}$	Firm size for a company (i) in a year (t) and type of industry
ε_{it}	Error term

5 Findings and discussion

This section outlines the findings obtained from running different statistical analytical techniques, including descriptive statistics, correlation and multiple linear regression analysis.

5.1 Descriptive statistic analysis

Table 3 summaries the descriptive statistical analysis for the periods between 2013 and 2018. The data indicate that the mean financial performance of the companies is 10.14%

and ranges from -21.54% and 235.46% under the ROA performance measurement. This means that on average, companies within the FTSE 100 achieved a ROA of 10.14% . The data also indicates that the mean EPS is $\pounds 1.07$ and ranges from $-\pounds 4.36$ to $\pounds 18.36$. This showcases that on average, companies within the FTSE 100 declared $\pounds 1.07$ to its shareholders.

Table 3 Descriptive statistic analysis results

<i>Variables</i>	<i>Mean</i>	<i>Std.D</i>	<i>Min</i>	<i>Max</i>	<i>Obs.</i>
<i>ROA (%)</i>	10.1423	28.77086	-21.54	235.46	354
<i>EPS (£)</i>	1.0370	1.55639	-4.36	18.36	354
<i>BZ</i>	11.5000	2.64869	7.00	23.00	354
<i>BM</i>	7.9774	2.14081	4.00	23.00	354
<i>BI</i>	0.6067	0.12584	0.29	0.93	354
<i>WB</i>	0.2498	0.08805	0.07	0.60	354
<i>CZ</i>	3.00	4.48	1.90	2.79	354
<i>TI</i>	0.186	0.390	0.00	1	354

Notes: *ROA* percentage of return on assets, *EPS* earnings per share in (£), *BZ* board size, *BM* number of board meeting, *BI* board independence, *WB* number of women on board, *CZ* company size and *TI* type of industry to control for financial and non-financial listed companies.

The optimal size for an effective board was explained to be between six and eight by Jensen (1993) and Mak and Kusnadi (2005). These researchers argued that board size exceed this threshold would encounter less effective coordination and decision-making. Yermack (1996) research supports the argument made by previous studies (Jensen, 1993; Mak and Kusnadi, 2005). However, Conger and Lawler (2009) regards the board size between 11 and 13 as ideal. The data indicates a mean value for board size of 11.5 showing that on average, there are 12 members on FTSE 100 board. These figures are greater than the amount suggested by Jensen (1993) and Mak and Kusnadi (2005), however the figures fall within Conger and Lawler (2009) suggestion. Moreover, the data shows that the FTSE 100 board size ranges from 7 to 23.

The mean number of board meeting held within a year is shown to be 7.98, which means that on average, approximately eight annual meeting are held by the board of the FTSE 100 in a fiscal year. Also, the number of meetings ranges between 4 and 23. This maximum number of meetings shown by the data contrasts with Jensen (1993), who states that boards should be relative inactive. Moreover, the UK corporate governance codes suggest excluding the chair, at least half of the board should comprise of independent directors to ensure the board's decision-making is not dominated by a small group of individuals. Therefore, as Table 3 shows that the means value of independent directors on FTSE 100 board is 0.6067, it signifies that on average the FTSE 100 comply with the corporate governance recommendations. The proportion of independent directors' range between 29% and 93%.

The average number for the composition of women within the board is 24.98%, which indicates that on average, 24.98% of the FTSE 100 board comprises of women. This figures ranges from 7% to 60%. Although there has been an increasing number of

women within company's board over the years (Adams and Ferreira, 2009), this average shown in Table 3 demonstrates the need for greater gender diversity with the FTSE 100 company's boards.

5.2 Correlation analysis

Table 4 shows the results of the Pearson correlation matrix was applied to examine the bivariate relationship between all variables included in our study. Specifically, Table 4 illustrates that board meeting is negatively associated with the financial performance of FTSE 100 firms, including both (*EPS* and *ROA*). Table 4 outlines that board size is negatively correlated with *ROA*. However, Table 4 demonstrates that there is insignificant relationship between the financial performance of FTSE 100 firms (*EPS* and *ROA*) and two internal corporate governance mechanisms, namely women on board and board independence.

Table 4 Correlation analysis results

<i>Pearson</i>	<i>EPS</i>	<i>ROA</i>	<i>WB</i>	<i>BM</i>	<i>BZ</i>	<i>BI</i>	<i>CZ</i>	<i>TI</i>
<i>EPS</i>	1							
<i>ROA</i>	0.091	1						
<i>BZ</i>	-0.011	-0.145**	1					
<i>BM</i>	-0.069	-0.030	0.073	1				
<i>BI</i>	0.021	-0.088	-0.006	0.168**	1			
<i>WB</i>	0.124*	0.070	-0.081	-0.006	0.301**	1		
<i>CZ</i>	0.158**	-0.084	0.334**	0.152**	0.422**	0.117*	1	
<i>TI</i>	-0.138**	-0.150**	0.260**	0.151**	-0.054	-0.074	0.046	1

Notes: *ROA* percentage of return on assets, *EPS* earnings per share in (£), *BZ* board size, *BM* number of board meeting, *BI* board independence, *WB* number of women on board, *CZ* company size and *TI* type of industry to control for financial and non-financial listed companies. *correlation is significant at the 0.05 level (two-tailed) and **correlation is significant at the 0.01 level (two-tailed).

5.3 Multivariate regression analysis

Table 5 displays the results of multiple linear regressions model to examine the relationship between *ROA* and four corporate governance mechanisms, including board size, board meeting, board independence and women on board. Additionally, Tables 4 and 5 outlines the adjusted R-square as 0.124 and 0.102 consecutively. This signifies that 12.4% and 10.2% of the *ROA* and *EPS* cumulatively is determined by the four corporate governance mechanisms included in our regression models, namely board size, number of board meetings, board independence and women on board. Consequently, it shows that the adjusted R² score for *EPS* model is quite low, which could be enhanced by using a greater sample size, years of study, eliminating insignificant variables, such as board independence, and including other variables, such as CEO-duality and audit-committee independence (Elmghaamez and Ntim, 2016).

Table 5 Results of multiple linear regression analysis on ROA

<i>Variables</i>	<i>Coefficients</i>	<i>t-statistic</i>	<i>P-value</i>
<i>BZ</i>	-1.135	-3.25	0.023*
<i>BM</i>	0.250	0.62	0.563
<i>BI</i>	-28.229	-2.39	0.062
<i>WB</i>	30.014	2.11	0.089
<i>CZ</i>	-3.330	-0.19	0.856
<i>TI</i>	-9.293	-10.33	0.000*
Cons	32.691	4.55	0.006*
Adjusted R-square	0.124		

Notes: *ROA* percentage of return on assets, *BZ* board size, *BM* number of board meeting, *BI* board independence, *WB* number of women on board, *CZ* company size and *TI* type of industry to control for financial and non-financial listed companies.

*correlation is significant at the 0.05 level (two-tailed).

Table 6 Results of multiple linear regression analysis on EPS

<i>Variables</i>	<i>Coefficients</i>	<i>t-statistic</i>	<i>P-value</i>
<i>BZ</i>	-0.021	-1.18	0.293
<i>BM</i>	-0.045	-2.21	0.078
<i>BI</i>	-1.250	-2.67	0.045*
<i>WB</i>	2.103	2.50	0.050*
<i>CZ</i>	7.450	4.40	0.007*
<i>TI</i>	-0.502	-4.55	0.006*
Cons	1.749	5.00	0.004*
Adjusted R-square	0.102		

Notes: *EPS* earnings per share in (£), *BZ* board size, *BM* number of board meeting, *BI* board independence, *WB* number of women on board, *CZ* company size and *TI* type of industry to control for financial and non-financial listed companies.

*correlation is significant at the 0.05 level (two-tailed).

5.3.1 Board size (*BZ*)

The findings highlighted in Table 5 indicates that board size and ROA have significant negative association. However, Table 6 shows that EPS is negatively, but insignificantly associated with board size. The results shown by ROA is consistent with previous empirical studies (Yermack, 1996; Mak and Kusnadi, 2005; Haniffa and Hudaib, 2006; Cheng, 2008; Guest, 2009; Afrifa and Tauringana, 2015). Meanwhile, some scholars indicated that EPS can be used as a performance measurement indicator (Larmou and Vafeas, 2009; Bhatt and Bhattacharya, 2015; Jackling and Johl, 2009). Additionally, the insignificant relationship between board size and EPS appears in Table 6 is consistent with the results reported by Garba and Abubakar (2014).

Furthermore, the negative relationship shown using ROA suggests that board with larger sizes are correlated with agency problems such as, a rise in issues related with communication, coordination and lessen ability for the board to control management, which reduced effectiveness within decision-making. Moreover, larger board generate

higher costs due to remunerations, which has a knock-on effect on the firm's profit and value (Haniffa and Hudaib, 2006). Hence, arguments from researchers' scholars for smaller boards (Yermack, 1996) is supported, and FTSE 100 firms should target for the optimal board sizes as stated by prior studies (Jensen, 1993; Mak and Kusnadi, 2005). Overall, as most of prior research supports the results shown by ROA, H1, which has been accepted. This means that boards size is negatively associated with the financial performance of listed companies.

5.3.2 *Board meetings (BM)*

Table 5 shows that the number of board meeting is identified to have a positive, but insignificant relationship with ROA. Whereas Table 6 indicates that the number board meeting is negatively, but significantly correlated with the use of EPS as a performance measure. These results are consistent with Jackling and Johl (2009), Bhatt and Bhattacharya (2015) and Naseem et al. (2017), who discovered an insignificant relationship between firm's performance and the number of board meetings. Though, the results obtained are inconsistent with some scholars, who found a positive and significant relationship (García-Ramos and García-Olalla, 2011). Yet, Vafeas (1999) and Brick and Chidambaran (2010), who also discovered that there is an inverse significant association between the number of board meetings and the financial performance of companies.

Moreover, the findings of EPS are in line with Jensen (1993) argument, who argued that boards intend to be relatively inactive, if their meeting number is increased. Moreover, the uncovered inverse association using ROA could be happened due to the boards role's importance rises when the firm performance is low (Jensen, 1993). Hence, a rising number of meetings is related with lower performing companies. However, the positive relationship using ROA supports agency theory, which suggests that the greater number of board meetings, the better financial performance as a result of the important of the board's operations and method heightening the board's effectiveness, which ensuring greater performance (Adams and Ferreira, 2009). Hence, this result leads to the acceptance of H2, which assumes that the number of board meetings is negatively related to the financial performance of listed firms.

5.3.3 *Board independence (BI)*

Table 5 shows that greater proportions of independent directors are shown to have an insignificant negative association with ROA of listed companies. This finding is in line with the results reported by prior empirical studies, which showed insignificant associations between financial performance and board independent (Vafeas and Theodorou, 1998; Haniffa and Hudaib, 2006, Dalton et al., 2007; Bhatt and Bhattacharya, 2015; Agrawal and Knoeber, 1996; Cole et al., 2001). However, Table 6 indicates that the EPS of a company is negatively and significantly associated with board independence. This result is inconsistent with other studies that discovered a positive significant relationship between EPS and independent directors (Rosenstein and Wyatt, 1990; Millstein and MacAvory, 1998; Coles et al., 2008; Arora and Bodhanwala, 2018).

The finding of using EPS supports the claim suggested by stewardship theory, which assumes a negative relationship between them, since stewardship theory argues that for good performance, greater amounts of insider directors is essential due to the benefits gained from familiarity to the business operations, whereas independent director's

information about the company can be restricted due to working on a part-time basis (Bozec, 2005). Moreover, the negative insignificant results shown in Table 5 can be stemmed by lack of true independence of the directors, as this results in ineffectiveness in monitoring the management (Haniffa and Hudaib, 2006). Hence, the negative results shown by EPS in Table 6 led to the rejection of H3, which means that greater proportions of independent directors are negatively associated with the performance of the top FTSE 100 listed firms.

5.3.4 Women on board (WB)

Table 5 shows that higher proportion of women within the board is correlated with an insignificant positive relationship with financial performance of FTSE 100 firms (*ROA*). The insignificant relationship shown using *ROA* is consistent with the results reported by most prior empirical studies, which discovered insignificant relationship between women on board and financial performance of a company (Rose, 2007; Miller and Triana, 2009; Haslam et al., 2010; Gallego-Álvarez et al., 2010). While, Table 6 shows a positive and significant association between EPS and the proportion of women within the board. This result is consistent with some previous studies (Campbell and Miguez-Vera, 2008; Dezsö and Ross, 2012; Perryman et al., 2016; Farag and Mallin, 2017; Ararat et al., 2015). Whereas, this finding is not consistent with the results indicated by some scholars, who found a negative relationship between number of women on board and financial performance (Bohren and Strom, 2010; Perryman et al., 2016).

Moreover, agency theory is supported by the positive relationship identified in Table 6, which assumes that female directors are important to the minimisation of agency cost due to benefit of contributing new perspective to the board and making complex decision. Additionally, the finding provide evidence for the arguments that including women with the board stimulates new insights on complex problems, which prompts greater performance and help problem solving (Westphal and Milton, 2000). Correspondingly, the findings support Ararat et al. (2015) argument, who reported that including women within the board positively influences the intensity of board's monitoring role, which in turn strongly impacts the financial performance of the company. Accordingly, the positive results verified by both EPS and *ROA* led to the acceptance of H4, which suggests that greater proportions of female directors are positively related with the financial performance of the FTSE 100 listed companies.

5.3.5 Firm size and type of industry

Table 6 shows that firm size is positively and significantly associated with EPS of the UK's top FTSE listed firms. While Table 5 reports a negative, but insignificant correlation between *ROA* and the firm size of the UK's top FTSE listed firms. Moreover, Tables 5 and 6 show that the type of industry had experienced a negative and significant association with both *ROA* and EPS of the UK's top FTSE financial listed firms.

6 Conclusions

Corporate governance mechanisms have not been sufficiently studied by prior research to examine their effects on the financial performance of the UK's top FTSE 100 companies

listed on the London Stock Exchange. Therefore, this study investigates the impact of four internal corporate governance mechanisms: board size, board meetings, board independence and the number of women on the board on the financial performance of the UK's top FTSE 100 listed firms. Our sample consists of 59 companies covering 354 observations from the UK's top FTSE 100 firms spanning 2013–2018, and the financial performance was measured by using two indicators, namely ROA and EPS.

Our results show that the size of the board is negatively and significantly associated with the ROA of the UK's top FTSE 100 companies. Furthermore, our findings indicate that the number of independent directors on the board is negatively and significantly related to the financial performance of the UK's top FTSE 100 firms measured by using *EPS*. Moreover, our study concluded that there is a positive association between greater proportions of women on the board and the *EPS* of the UK's top FTSE 100 firms. Finally, our study revealed that there is a positive, but insignificant relationship between ROA of the UK's top FTSE 100 firms and the number of board meeting and the proportions of female on the board. Our results support the expectations of agency theory, which assumes that companies would gain from practicing good governance, since it enhances corporate performance (Fama and Jensen, 1983).

Our study provides important implications to academic literature on corporate governance to encourage them to conduct more research on the relationship between corporate governance mechanisms and the financial performance in different sectors and various countries and at different times. Moreover, this study also offers important implications for policy makers in the UK to motivate them to issue codes that lead to appoint an optimal size of board of directors and independent directors on the board, since our results show a negative relationship between them. Furthermore, our study suggests that governance codes in the UK should include policies for having more women on the boards of the UK top FTSE listed firms as a result of the positive relationship that we found between firm performance and women on the board, which is in line with agency theory expectation (Jensen, 1993; Salloum et al., 2013).

This study has some limitations that should be acknowledged. Firstly, this study has merely applied two main theories namely, agency theory, and stewardship theory. However, there are many other theories that can be used to test the relationship between corporate governance mechanisms and corporate performance, such as stakeholder theory, legitimacy theory, resource-based theory and optimal board independence theory (Maher and Andersson, 2002; Crespi-Cladera and Pascual-Fuster, 2014). Secondly, we only included a sample consists of 59 of the UK's top FTSE 100 firms due to limited availability of needed data, since including a large sample size allows greater generalisability, reliability. Thirdly, we included merely four internal corporate governance mechanisms to examine their impact on the financial performance of the UK's top FTSE 100 listed firms. Therefore, as data become available, future studies might include other internal corporate governance mechanisms, such as CEO duality, board structure, ownership concentration, structure of boards of directors and audit committee independence (Elmghaamez and Ntim, 2016; Wahba and Elsayed, 2014). Fourthly, further study can be also done by investigating the impact of external corporate governance mechanisms and regulatory guidelines imposed by external stakeholders on corporate performance, such as governments, industry associations, trade unions, financial institutions, and stock markets. Fifthly, our study has solely included two profitability ratios, namely (ROA and EPS) to measure the financial performance of

firms listed on LSE, nevertheless, there are many other financial ratios that can be used by future research to measure the financial performance of the UK's top FTSE 100 firms, such as liquidity ratios, leverage/solvency ratios and turnover/activity ratios. Finally, this study has applied accounting-based indicators (ROA and EPS) to measure the past financial performance of firms listed on LSE, nonetheless, this study suggests that future research should use market-based indicators to measure of the future performance of companies by using some financial indicators, such as Tobin's Q and market-to-book value ratio or by combining between the accounting and market-based measures to provides a clear picture of the firm performance.

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