

Saidu, Sani

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CEO characteristics and firm performance: focus on origin, education and ownership



Sani Saidu^{1,2}

Correspondence:

saidusani1@gmail.com

¹School of Accountancy, Universiti
Utara Malaysia, Sintok, Malaysia

²Department of Accounting, Bauchi
State University, Gadau, Nigeria

Abstract

This study examines the impact of the chief executive officer's (CEO) ownership, education and origin on firm performance. The study uses balanced panel data for 6 years from 2011 to 2016 to run ordinary least square regression. Three variables that include the CEO origin, education and ownership are investigated in relation to firm performance. These characteristics are some of the basic CEO characteristics that are rarely considered by prior studies. The study uses a sample from firms in the financial sector listed on the Nigerian Stock Exchange from 2011 to 2016. The findings indicate that CEO education improves profitability. Similarly, stock performance gets improved when the CEO has prior experience of the firm before being appointed as the chief executive officer. The findings will be useful to shareholders in making an informed decision in selecting the right CEO to manage the firm. Further studies need to consider not only the CEO ownership, but also whether the interest in ownership makes them more powerful.

Keywords: CEO power, Education, Origin, Firm performance, Entrepreneurial drive

Introduction

Studies have identified ownership as one of the good sources of power both in theory and in practice (Wu et al. 2011). The major determinant of agent-principal relationship in agency theory is the ownership of the company. Unlike the case of agency relationship, the CEO who acquires a good proportion of company shareholding will be an agent-cum-principal officer which gives him a good ground to influence almost every activity in the organization (Mio et al. 2016). When the CEO has significant stock ownership, he can influence the selection of other directors, hence giving him an edge over the other members of the board. Having significant ownership will enable the CEO to influence the determination of the board member's remuneration, scuffling their dismissal if need be, and dominate in most of the board decisions (Zhang et al. 2016). The mind-boggling question as to whether ownership in companies could result in firm performance and value across all settings still remained not fully answered. This study resolves to unravel the agency issue in CEO ownership with its implication in firm performance in Nigeria's highly regulated sector.

Many of the recent studies ascribed agency situation to CEOs, and most of the studies used variables that have to do with managerial discretion (Gupta et al. 2016; Veprauskaite and Adams 2013). Findings from most of the studies reported the negative impact of CEO power. The motive to study the CEO managerial discretions is not

connected to the recent happening in the governance structure whereby some CEOs of global companies such as Enron and WorldCom engaged in some corporate scandals. However, this study takes a different approach by looking into those qualities that denote experience. An important source of CEO wisdom is when the CEO is educated. Education is power, and it is presumed that when better education and experiences are merged, there is a high tendency of acquiring a greater managerial skill and thereby delivering the organization even during the hardest time. Prior studies show that CEO education is important in many of the corporate decision (Malmendier and Tate 2008). The outcomes of such decisions are reflections of the qualities of the CEOs. Bowers and Seashore (1966) posited that advanced technical and managerial skills are exhibited when a manager attained higher level of education. This study goes further to see if such educated CEOs implement best decisions that have good consequence to the firm's performance. Similarly, experiences of a manager could not be overvalued in that experiences can alter their instincts. Robinson and Sexton (1994) opined that education and experience are two inseparable quality of a good manager with high entrepreneurial drive. This study will, in addition to CEO ownership, examine the impact of CEO education and prior experience in the organization. This is due to the importance of the two qualities as explained by the prior studies. To examine these three CEO characteristics, this study analysed data from the financial sector which consists of listed banks, insurance companies, and other financial service firms. The sector is one of the sectors that require high managerial skills for the CEO and reasonable CEO share ownership in the company's stakes. The finding from the analysis confirms that CEO education improves firm profitability. Also, stock performance gets improved when the CEO has prior experience of the firm before their appointment as the chief executive officer.

The remaining part of this paper is divided into four such that the "[Literature review and hypothesis development](#)" section discusses the literature reviews while the "[Research design](#)" and "[Result and discussion](#)" sections focus on the research design and data analysis, respectively. The "[Conclusion](#)" section discusses the conclusion of the study.

Literature review and hypothesis development

CEO ownership

CEO ownership is recognized as one of the good sources of power both in theory and in practice (Finkelstein 1992; Onali et al. 2016; Wu et al. 2011). The major determinant of agent-principal relationship in the agency theory is the ownership of the company. Zhang et al. (2016) established that CEO ownership in company has connection with some important board decisions such selections, determination of the members remunerations and many other decisions.

The agency interest alignment hypothesizes that when an owner-manager heads a firm, there is a high tendency that he will work toward achieving the target of the firm. While some studies confirmed such prediction, many empirical evidences proved otherwise. Adams et al. (2005) investigated the impact of CEO power on firm's performance variability. The finding from the study revealed that CEO ownership has positive impact on firm performance. In the same manner, Onali et al. (2016) examined the degree of firm leadership influence on firm performance of European banks. The study also attempted to find the impact of the power on dividend policy using a 9-year

panel data. The findings revealed CEO ownership has influence on firm performance as measured by market-to-book value and Tobin's q .

Contrary findings are also available by some studies. For instance, Fahlenbrach (2009) analysed a 10-year data investigating the relationship and reported that CEO ownership has negative impact on firm performance as measured by Tobin's q . Also, Kaczmarek et al. (2014) examined the impact of CEO ownership in an attempt to find the effect of interlocking directorship. The study revealed that there is a significant negative relationship between CEO ownership and firm performance. In the same direction, Adams and Mehran (2012) and Shukeri et al. (2012) revealed the negative impact of ownership on firm performance. Adams and Mehran (2012) maintained that it is surprising to report such an outcome because the previous works showed no significant relationship. They however maintained that the differences may have occurred as a result of difference in timeframe for the data used in the analysis. Limbach et al. (2016) discovered that there is a non-linear but U-shaped relationship between the CEO power and firm value. The nature of relationship is negative. Going by the inconsistencies in the findings in prior studies, this study deemed it relevant to extend the study to a different context because differences in culture, customs, and practice may differ across different environments. Similarly, the nature of CEO ownership differs across industries; hence, this study considers data from the financial sector in a developing country.

H1. CEO ownership has a significant impact on firm performance.

CEO education

One of the precursors to better managerial effectiveness is the attainment of some level of education. Education is an important tool for consideration in the employees' promotion and perhaps the remuneration. A good level of education has significance in raising the managers' prestige hence enabling them to give out optimum decision (Certo 2003). Various findings from prior studies identify the importance of education by the management staff. Rajagopalan and Datta (1996) investigate relationships between CEO characteristics and comprehensive set of industry conditions. Analysing the data from the US manufacturing sector, the result indicates that the CEO educational level is aligned with the company's performance. Similarly, Kokeno and Muturi (2016) explored the impact of CEO characteristics on firm performance using data of firms listed in the Nairobi Securities Exchange. The result from the analysis indicates that CEO age and CEO education had positive and significant effect on firm performance. In contrast, some studies could not establish the relationship between the CEO's level of education and firm performance. For instance, Gottesman and Morey (2010) used evidences from the US firms and findings indicate no significant relationship. However, Gottesman and Morey (2010) used only a market-based measurement—Tobin's q . Furthermore, Lindorff and Jonson (2013) investigated the impact of CEO business education on performance. The findings indicated that CEO business education does not influence firm performance. The study furthered that business education is only over-emphasized. The study however used Masters of Business Administration (MBA) as the only measure of CEO education and dividend return and changes in share price as the performance measure. This could be challenged because MBA is only one fragment of business education.

Darmadi (2013) extended the study on CEOs by examining the influence of education of the CEO and other members of the board of directors on the firm performance of Indonesian firms. The result from the analysis shows that the educational qualifications of board members and the CEO matter. CEOs holding degrees from prestigious domestic universities perform significantly better than those without such qualifications. An attempt was made to find the impact of CEO educational level and the firm environmental performance. Obtaining evidence from 392 firms between 2005 and 2010, Huang (2013) find that environmental performance, as measured by the consistency of Corporate Social Responsibility (CSR) ranking, is strongly related to the educational level of the CEO especially master's degree, i.e., Masters of Science (MSc.) and MBA.

Koyuncu et al. (2010) examine the role CEO educational background has on firm performance based on a sample of 437 CEOs of firms selected from S&P 500 firms using data for the period 1992–2005. The results of their study showed evidence in support of the hypothesis that firms managed by a CEO with an educational background in operation-related subjects such as engineering had better firm performance than firms headed by CEOs with other functional backgrounds. In addition, the results of the study also showed evidence to support that firms which were experiencing low performance were more likely to recruit a CEO with a background in operations than those with a background in marketing, finance, law, or accounting. Daellenbach and McCarthy (1999) affirmed that firms need to concentrate on the selection of top management in operations and technical experience if their core strategy for competition was innovation in product development. Based on the above prior studies, the following hypothesis is drawn:

H2. CEO education has a significant impact on firm performance.

CEO origin

A CEO is appointed either from within the firm workforce or appointed from outside the company, and whichever case, there are different interpretations to the mode of entry into the post. The CEO that is promoted to the position has some form of advantage over his contemporaries. Some studies describe such advantage as power they have (Pathan 2009; Zhang and Rajagopalan 2010). Some studies view it as the presence of the CEO as the only insider director on the board which gives them power over other executives at the top management team (Adams et al. 2005). Similarly, the CEO who is promoted from within the company's workforce signifies there power (Weisbach 1988; Pathan 2009; Zhang and Rajagopalan 2010). In other words, when a manager is promoted from within the company instead of being outsourced, it may imply that he/she is promoted due to some special qualities and advantages over the other managers.

Evidence shows that firms with a CEO that is succeeded by an insider are proved to perform better than those with a CEO being outsourced (Rhim et al. 2006). Daily and Schwenk (1996) opined that a manager may be promoted as a result of insider dominance. Victoravich et al. (2011) used the proportion of insider directors on the corporate board as an indicator to reduce the CEO power. A finding from data analysis indicates that specific risks reduce with the CEO power. In other words, the greater the CEO power, the more the firm becomes risk averse.

Adams et al. (2005) also investigated CEO power on the firm's variability of performance using the CEO as the only insider board member as one of the CEO power. The result from the analysis indicates the stock is more variable when the CEO has more power. Also, Zheng (2010) reported that the percentage equity-based compensation of outside CEO increases in the early part of his tenure and decreases later. The study also documented that CEOs who are sourced from outside have higher and faster growing equity-based compensations than inside CEOs. In the same vein, better performance through an increase in shareholder's return is attributed to CEO insider (Favaro et al. 2011). In line with the prior studies, the following hypothesis is formed:

H3. CEO insider has positive impact on firm performance.

Interaction

The advocates of agency theory emphasized on the ownership, which is the key divide of the relationships between the shareholders and the managers such that each party is trying to maximize benefits of the relationships. The theory projects that powerful CEOs can use their power in achieving their own end which in many cases is not in line with those of the shareholders (Tien et al. 2014). Some studies show that greater degree of decision-making discretion of CEO widens the information asymmetry and the chances for the CEO to make decision that may not benefit the shareholders (Brown and Sarma 2007; Veprauskaite and Adams 2013). This entails that any attempt to increase the CEO power may affect the performance adversely. In the light of above, this study considers the interaction of CEO characteristics as a way of raising CEO power and stated the following hypotheses:

H4. The interactive effect of CEO ownership and CEO education affects firm performance positively.

H5. The interactive effect of CEO ownership and CEO insider affects firm performance positively.

H6. The interactive effect of CEO education and CEO insider affects firm performance positively.

Research design

The study aimed at examining the impact of CEO characteristics focusing on the level of education, ownership and origin before their appointment. To study the impact of CEO characteristics on firm performance, the study obtained data from the financial sector which comprises of 56 listed firms that include banks, insurance, life assurance and other financial service firms. The sample of the study comprises 37 firms which met the relevant information disclosure criteria. The study considers data for a 6-year period from 2011 to 2016 leading to 222 firm year observation. The period is considered due to the fact that 2011 marked the year from which companies in Nigeria are mandated to report their financials in line with the International Financial Reporting Standard (IFRS). Sample is taken from the sector due to its intriguing nature which made the code impose some strict regulation on the tenure of the directors with special emphasis on the CEO. Also, there is a high need for CEO with the basic experience needed for the sectors. Furthermore, the sample is reduced to 37 firms as a result of the unavailability of information from other firms (Veprauskaite and Adams 2013).

Dependent variable

For the purpose of this study, market price of the equity, return on asset (ROA), and return on equity are used as the dependent variables which are the measure of the firm performance. Stock price is the market reaction to what is happening with the firm. It is an important indication of firm performance and used in many studies (Anthony and Ramesh 1992; Ishak and Abdul Latif 2012; Tosi et al. 2004; Yemi 2013). ROA and return on equity (ROE) are generally considered as the performance measurement in business research (Binacci et al. 2016; Murphy et al. 1996). ROA is measured as the ratio of the net income for the year divided by the total asset at the end of the year. ROA is generally used as the measure of firm performance because it considers not only the operational events over the year but also the relevance of the historical antecedence of the firm over the year. ROE is the ratio of the net income for the year divided by shareholders' equity at the beginning of the financial year. ROE measures the ability of a firm to generate income from its shareholders' investments in the firm.

Independent variables

This study aimed at finding empirical evidence on the relationship between CEO characteristics and firm performance. Although there are numerous characteristics of CEO considered by prior studies, this study is restricted to three of the basic characteristics. The three characteristics denote CEO experience. Although other variables are still relevant, the study considers the three because they are the information that is easily available in the annual reports of companies in Nigeria. The variables include the CEO ownership, CEO insider, and CEO education. CEO ownership is the percentage of both direct and indirect shareholdings of the CEO in the firm. The direct holdings are those shares held by the CEO at the end of the year, while the indirect shares include all shareholding of the CEO in other firms that have significant interest in the firm they manage. The CEO ownership is therefore measured as the percentage of the CEO's direct and indirect shares to the total equity of the firm (Dowell et al. 2011; Duru et al. 2016; Luo 2015). The second of the three independent variables is CEO education. Some empirical studies pointed that CEO education has an impact on some firms' outcomes. This study used the level of education attained by the CEO as a dummy variable such that 1 represents CEO with postgraduate education otherwise 0 (Darmadi 2013; Ujunwa 2012). Lastly, the study uses CEO origin. In line with Zhang and Rajagopalan (2010), this study considers the CEO origin before appointment. CEO insider is appointed from within the company, and the dummy variable is used to indicate the CEO insider such as in Favaro et al. (2011) Ishak and Latif (2012), and.

Control variables

This study follows many other previous studies to control for a firm-specific effect using some control variables. Three variables are used in the study to control for the firm-level effect on the regression result. The variables are frequently used in firm performance relationships. The study uses firm size that is measured as the log of the total assets at the year-end. Similarly, the study uses the ratio of cash flow to total assets as a control for the effect of the cash inflow from operating activity across the firm. Finally, the study uses leverage ratio which is the ratio of the debt to equity.

Model

To find the relationship between the study variables, this study uses ordinary least square regression to test the hypothesis on the relationship between the CEO characteristics and firm performance. The dependent variable in the model is firm performance, and three proxies are used for the performance. The proxies include the market performance measured by the market price of the equity. The other two performance indicators are accounting-based measures which include the return on assets (ROA) and return on equity (ROE). The independent variables are the CEO ownership, CEO education, and CEO origin. The analysis used cross-sectional observations of 6 years from the selected firms. Ordinary least square model is used by prior studies in testing the hypothesis on the relationship between CEO characteristics and firm outcomes such as financial performance (Barker and Mueller 2002; Henderson et al. 2010; Simsek 2007). The model is expressed as follows:

Performance = f (CEO characteristics)

$$\text{PERFORMANCE} = \alpha + \beta_1 \text{CEO_OWN}_{it} + \beta_2 \text{CEO_EDUC}_{it} + \beta_3 \text{CEO_IN}_{it} + \beta_4 \text{Size}_{it} + \beta_5 \text{CFO}_{it} + \beta_6 \text{LEV}_{it} + \epsilon \dots 1$$

$$\text{PERFORMANCE} = \alpha + \beta_1 \text{CEO_OWN}_{it} + \beta_2 \text{CEO_EDUC}_{it} + \beta_3 \text{CEO_IN}_{it} + \beta_4 \text{CEO_OWN} * \text{EDUC}_{it} + \beta_5 \text{CEO_OWN} * \text{IN}_{it} + \beta_6 \text{CEO_EDUC} * \text{IN}_{it} + \beta_7 \text{Size}_{it} + \beta_8 \text{CFO}_{it} + \beta_9 \text{LEV}_{it} + \epsilon \dots 2$$

where

α = intercept

ROA = return on assets, ROE = return on equity, SP = stock price

CEO_OWN = CEO ownership, CEO_EDUC = CEO education, CEO_IN = CEO insider

SIZE = firm size

CFO = cash flow from operation

LEV = leverage ratio

ϵ = error term

Result and discussion

The study observes that there are some outliers in some of the observations in the original data set. The study, therefore, winsorized all the variables at the 5th and 95th percentile to mitigate the effect of the outliers. Prior studies that used a similar technique by using between 1 and 10% of the lower and upper limits attenuate the potential outliers (Fan et al. 2016; Hochberg et al. 2006; Vafaei et al. 2015). The results from analysing the data are discussed under the three subheadings below. They include the descriptive statistics, correlational matrix, and regression result.

Descriptive statistics

The result of the descriptive statistics could be referred to on Table 1 below. The descriptive statistics describes some of the basic statistics for all the variables of the study. The table highlighted some of the basic statistics about the data which include the mean, maximum, and minimum values for each of the variables. The maximum value for the stock price in the data set for all companies is 28.95 for the study period while the minimum stock price is 27 kobo. The mean value of the stock across all the

companies is 4.02 with a standard deviation of 6.07. Similarly, the other two measures of performance (ROA and ROE) have maximum values of 97.8 each. The mean and standard deviation are 3.78 and 10 for ROA and 4.52 and 29.3 for ROE, respectively. The high variation in the standard deviation figure might be as a result of high volatility in the sector under study. The maximum share ownership by the CEO is 10.15%, while the mean and standard deviations are 3.2% and 0.07, respectively. In the same vein, 75% of the CEO of the firms have a postgraduate certificate which means that an average CEO has at least a master's degree. Similarly, 63% of the CEOs are company insiders. This indicates that the average practice of the industry is that CEO is promoted rather than being outsourced.

Correlation matrix

Table 2 below highlights the correlation among the variables using the Pearson correlation technique. The table shows that there is a negative correlation between CEO ownership and firm profitability as measured by the stock return but is positively related to return on assets (ROA). Similarly, the result shows that CEO education is positively related to ROA. CEO insider has shown to have a positive relationship with both return on equity (ROE) and ROA. The positive correlation of CEO insider is not surprising in that Serra et al. (2016) pointed out that a CEO with industry expertise may affect performance positively. Overall, the Pearson correlation shows that the overall experience is negatively correlated with firm performance in the financial sector.

Diagnostics

The validity of an ordinary least square regression as a good estimator could only be established if the classical assumptions of the model hold true. This study checks some of the most important assumptions of the regression model. One of such assumptions is the normality of the error terms of the distribution. This study uses various tests for data normality which include skewness and kurtosis and the Shapiro-Wilk test to ascertain that the error terms of the dependent variables have the mean value of 0. Below is the descriptive statistics for the data normality after winsorizing at the fifth percentile.

Table 3 presents the statistics for all the variables with respect to the skewness and kurtosis of the distribution. Sekaran and Bougie (2009) established that data are normally distributed only if the values for skewness and kurtosis are within the acceptable

Table 1 Descriptive statistics

| Variables | Mean | Max | Min | Std dev. | SE (mean) | N |
|---------------------|--------|-----------|-----------|----------|-----------|-----|
| Stock price | 4.024 | 28.950 | 0.270 | 6.072 | 0.408 | 222 |
| ROA | 3.782 | 97.820 | − 25.950 | 10.072 | 0.676 | 222 |
| ROE | 4.522 | 97.820 | − 265.000 | 29.345 | 1.970 | 222 |
| Total assets | 72,500 | 6,220,000 | 4664 | 120,000 | 8.0300 | 222 |
| Operating cash flow | 10,200 | 389,000 | − 159,000 | 57,500 | 38.60 | 222 |
| CEO ownership | 0.032 | 1.015 | 0.000 | 0.079 | 0.005 | 222 |
| CEO education | 0.752 | 1.000 | 0.000 | 0.433 | 0.029 | 222 |
| CEO insider | 0.631 | 1.000 | 0.000 | 0.484 | 0.032 | 222 |

ROA return on assets, ROE return on equity, N number of observations

Table 2 Pearson's correlation matrix

| Variable | Stock pr. | ROA | ROE | CEO_OWN | CEO_EDUC | CEO_IN | SIZE | CFO | LEV |
|-----------|-----------|-----------|-----------|-----------|----------|---------|-----------|-----------|-----|
| Stock pr. | 1 | | | | | | | | |
| ROA | − 0.082** | 1 | | | | | | | |
| ROE | 0.337** | 0.520** | 1 | | | | | | |
| CEO_OWN | − 0.181** | 0.167** | 0.070 | 1 | | | | | |
| CEO_EDUC | − 0.014 | 0.152* | 0.056 | 0.149** | 1 | | | | |
| CEO_IN | 0.275* | 0.030 | 0.193** | 0.100 | 0.036 | 1 | | | |
| SIZE | 0.139** | − 0.250* | − 0.176** | − 0.134** | − 0.063 | 0.133 | 1 | | |
| CFO | − 0.161** | 0.364** | 0.189** | 0.129 | − 0.120 | − 0.013 | − 0.235** | 1 | |
| LEV | 0.719 | − 0.131** | 0.298** | − 0.256 | − 0.116 | 0.221* | 0.165** | − 0.236** | 1 |

ROA return on assets, ROE return on equity, CEO_OWN CEO ownership, CEO_EDUC CEO education, CEO_IN CEO insider, SIZE firm size, CFO operating cash flow, LEV leverage ratio. * $p < 0.05$, ** $p < 0.01$

range. Following Saunders et al. (2009), skewness within the range of ± 2 is acceptable while similar value for kurtosis is ± 8 . Table 3 shows that the lowest and highest values for skewness are -1.16 and 1.61 , respectively. The kurtosis of the distribution has the highest value of 4.19 and the least value of 1.29 . This implies that the data are normally distributed for all the variables. Similarly, using the Shapiro-Wilk test, the result of the test using the statistical software STATA (13) shows that the residuals are normally distributed.

Furthermore, the study checks for multicollinearity using variance inflation factor (VIF). A multicollinearity problem could be established if any two variables are linearly closed combination of one another. The tolerance value is the measure of how much of the variability of a particular variable is not explained by other explanatory variables. The value ranges between 0 and 1 but the closer to 1 the better. VIF is an inverse of tolerance value, and the value above 10 indicates multicollinearity problem (Palant 2007). Table 4 below shows that all the VIFs are below 10 and the tolerance values are within the acceptable range. Similarly, the Pearson correlation coefficient is used to check the presence of multicollinearity. According to Tabachnick and Fidell (2001), when the value of a Pearson correlation coefficient is or above 80%, there is a likelihood of a presence of multicollinearity problem.

Regression result

This study examines the impact of CEO characteristics that include the CEO ownership, CEO education, and CEO origin/insider on firm performance. Ordinary least square regression is used to test the hypothesis and determine the nature of the relationship. Two models are used in testing the hypothesis on the impact of characteristics

Table 3 Skewness and kurtosis

| | Stock pr. | ROA | ROE | CEO_OWN | CEO_EDUC | CEO_IN | LEV | CFO | SIZE |
|-----------|-----------|------|--------|---------|----------|--------|-------|-------|-------|
| Skewness | 1.61 | 0.79 | − 0.38 | 1.50 | − 1.16 | − 0.54 | 0.80 | 0.39 | 0.36 |
| Kurtosis | 4.19 | 3.22 | 3.22 | 4.01 | 2.36 | 1.29 | 2.96 | 2.47 | 1.43 |
| SE (Mean) | 0.33 | 0.33 | 0.77 | 0.002 | 0.029 | 0.032 | 0.006 | 0.004 | 0.067 |
| N | 222 | 222 | 222 | 222 | 222 | 222 | 222 | 222 | 222 |

ROA return on assets, ROE return on equity, CEO_OWN CEO ownership, CEO_EDUC CEO education, CEO_IN CEO insider, SIZE firm size, CFO operating cash flow, LEV leverage ratio

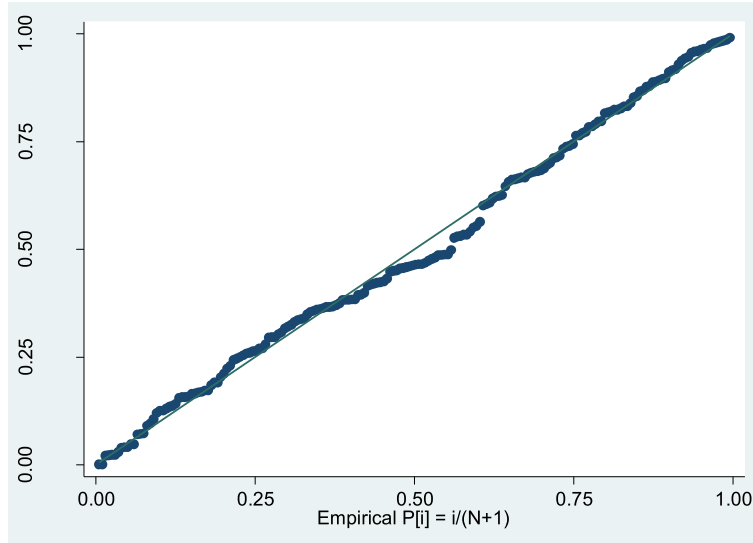
Table 4 Result of the multicollinearity test

| Variable | VIF | Tolerance |
|----------|------|-----------|
| SIZE | 1.22 | 0.82 |
| CFO | 1.15 | 0.87 |
| CEO_OWN | 1.13 | 0.88 |
| LEV | 1.10 | 0.90 |
| CEO_IN | 1.10 | 0.91 |
| CEO_EDUC | 1.07 | 0.93 |
| Mean VIF | 1.13 | |

ROA return on assets, ROE return on equity, CEO_OWN CEO ownership, CEO_EDUC CEO education, CEO_IN CEO insider, SIZE firm size, CFO operating cash flow, LEV leverage ratio

on firm performance measured by stock price, ROA, and ROE. The first model tested the direct relationship between CEO ownership, CEO education, and CEO origin on firm performance. The second model is used to test the interaction effect of the independent variables on the firm performance so as to find out if interaction has a moderating effect on the relationship. The overall regression models are significant at the 99% level of confidence for all the models (Figs. 1, 2, 3, and 4). This indicates that the two models are statistically fit. Similarly, the value of the adjusted R^2 for all the models shows the overall changes in the respective dependent variables that are attributed to the CEO characteristics and the control variables. The result of the regression for all the two models is summarized in Table 5 below.

Model one tests hypothesis 1 to 3, and the result confirmed hypothesis 2 and 3. Hypothesis 2 anticipates a positive relationship between CEO education and firm performance. The result of the analysis indicates that CEO education has a positive impact on firm performance measured by the ROA. Furthermore, it shows positive relationship with the two other indicators of firm performance (stock price and ROE), but the result is not significant. This is in line with some studies that established that education improves CEO connections and, by extension, the firm performance (Kokeno and Muturi

**Fig. 1** Probability of the residual plot for regression model 1

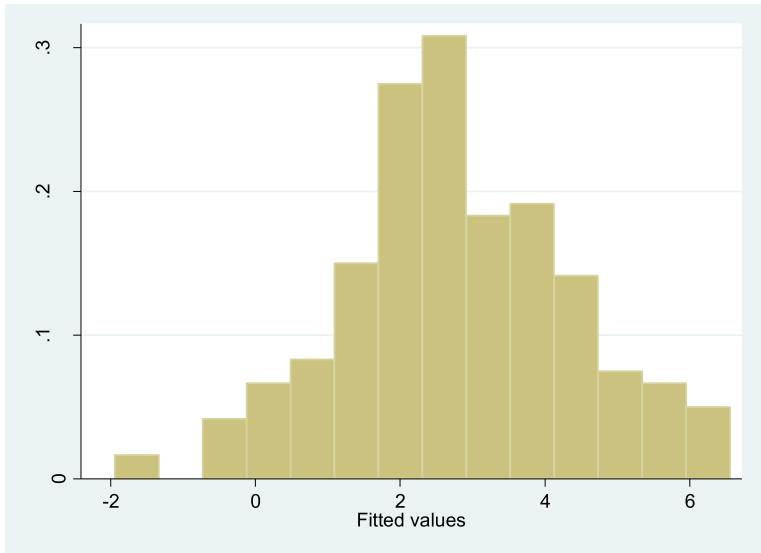


Fig. 2 Histogram of the residual for model 1

2016; Rajagopalan and Datta 1996). The studies established that education is important in equipping the managers toward making and implementing better decisions for the firms. Similarly, the result establishes that the relationship between CEO insider and firm performance is positive. In other words, CEO insider affects firm’s stock performance positively as shown in Table 5 below. Furthermore, the study tested the hypothesis on the interaction between the CEO characteristics. The result improves with respect to return on assets. This means that any interaction between any two of the three CEO characteristics will improve firm’s return on assets.

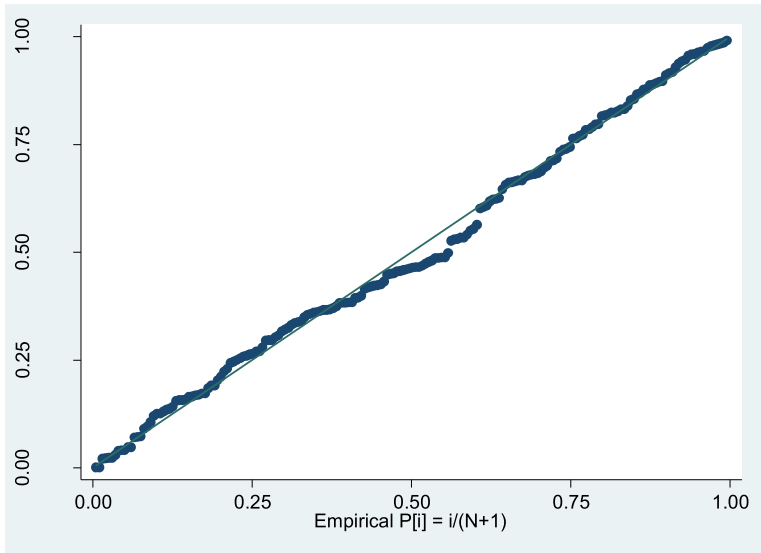


Fig. 3 Probability of the residual plot for regression model 2

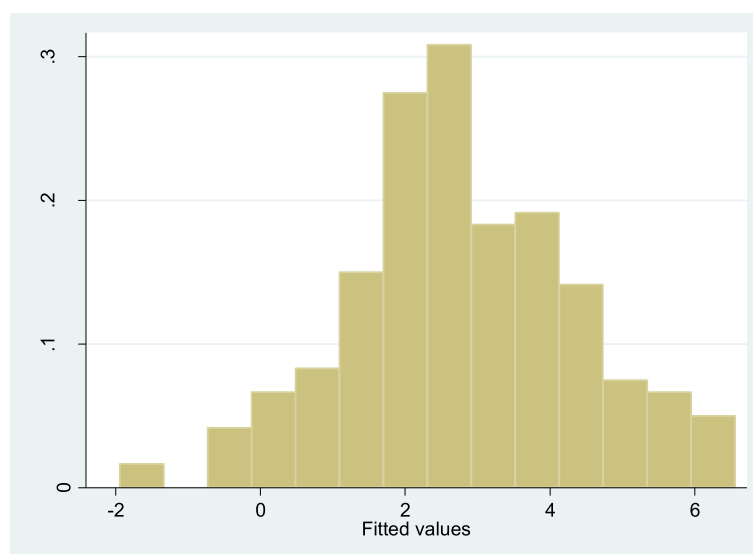


Fig. 4 Histogram of the residual for model 2

Table 5 Summary of the regression result

| | Model 1 | | | Model 2 | | |
|--------------|-------------------------|----------------------|------------------------|-------------------------|-----------------------|------------------------|
| | Stock pr. | ROA | ROE | Stock pr. | ROA | ROE |
| CEO_OWNI | − 3.318 (− 0.53) | 9.296 (1.13) | 26.06 (1.38) | 2.434 (0.12) | 58.05* (2.32) | 144.4* (2.49) |
| CEO_EDUC | 0.796 (1.45) | 1.959** (2.73) | 2.728 (1.65) | 0.504 (0.55) | 3.593** (3.07) | 0.120 (0.04) |
| CEO_IN | 1.224* (2.45) | 0.418 (0.64) | 2.900 (1.93) | 1.225 (1.20) | 3.112* (2.37) | 1.408 (0.46) |
| SIZE | 3.422*** (13.59) | 0.0213 (0.06) | 4.503*** (5.95) | 3.411*** (13.24) | − 0.174 (− 0.53) | 4.365*** (5.72) |
| CFO | 1.533 (0.41) | 25.51*** (5.22) | 42.35*** (3.77) | 1.478 (0.39) | 26.40*** (5.40) | 39.37*** (3.48) |
| LEV | 0.762 (0.29) | − 8.449* (− 2.43) | − 23.12** (− 2.89) | 0.744 (0.28) | − 8.968** (− 2.61) | − 23.92** (− 3.02) |
| CEO_OWNIIN | | | | − 10.41 (− 0.73) | − 42.22* (− 2.32) | − 101.6* (− 2.41) |
| CEO_OWNIEDUC | | | | 2.340 (0.15) | − 24.33 (− 1.18) | − 53.09 (− 1.12) |
| CEO_EDUCIN | | | | 0.346 (0.30) | − 2.147 (− 1.44) | 5.268 (1.52) |
| _CONS | − 24.94*** (− 11.71) | 0.989 (0.36) | − 32.47*** (− 5.07) | − 24.81*** (− 11.49) | 0.702 (0.25) | − 30.87*** (− 4.83) |
| Adj. R^2 | 52.43% | 18% | 20.92% | 51.91% | 20.62% | 22.40% |
| N | 222 | 222 | 222 | 222 | 222 | 222 |

ROA return on assets, ROE return on equity, CEO_OWNI CEO ownership, CEO_EDUC CEO education, CEO_IN CEO insider, SIZE firm size, CFO operating cash flow, LEV leverage ratio. t statistics in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Conclusion

This study examines the impact of the CEO ownership, education, and origin on firm performance. The study uses sample from firms in the financial sector listed on the Nigerian Stock Exchange. The findings indicate that CEO education improves profitability. Similarly, stock performance gets improved when the CEO has prior experience of the firm before his appointment as the chief executive officer. The study focuses on ownership because it forms the bases for the agency theory, and nowadays, the CEO, who has been one of the key components of the theory as the principal, takes part in the ownership of the business. Also, CEO education is important in that it forms the source of connections for the executives. Similarly, promoting the senior executive to the position of the CEO is healthy for the firm; therefore, directors need to be encouraged to consider insiders in the appointment to the position when the need arises. Further studies need to consider not only the CEO ownership, but also whether the interest in ownership makes them more powerful. This study will be valuable to many of the firm stakeholders in taking appropriate steps in resolving some of the agency problems the firm may face with respect to the executives. The findings will be useful to shareholders in making an informed decision in selecting the right CEO to manage the firm. Further examinations may consider about the use of a few models in setting up the connection between the CEO qualities and firm qualities by utilizing diverse models, for example, GMM (as in Veprauskaite and Adams 2013) and design of experiment (as in Dar and Auradha 2018; Dar and Anuradha 2018b; Dar and Anuradha 2018c).

Abbreviations

CEO: Chief executive officer; ROA: Return on assets; ROE: Return on equity; VIF: Variance inflation factor

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Availability of data and materials

The data and all the materials used for this study are with the authors and will be made available to the Journal when the need arise.

Declaration

The author makes the following declaration with respect to this article;

Authors' contributions

The author of the paper has contributed sufficiently to the project. SS developed the research idea and discussed thereto for further development. His colleagues from the Accounting Department of BASUG also contributed greatly in suggesting the appropriate theory for the research and provided some helpful materials. Finally, SS analysed the data and drafted the paper to the conclusion. The author read and approved the final manuscript.

Competing interests

The author declares that he/she has no competing interests.

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