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Corporate Social Responsibility and Financial Performance of Listed Oil and Gas Companies in Nigeria: Moderating Effect of Firm Size

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Abstract

Corporate social responsibility is the way through which firms discharges their responsibilities to the members of its immediate community where they operate their business in order to have good corporate citizen. This study investigates the moderating effects of firm sizes on the relationship between Corporate social responsibility and financial performance of listed oil and gas companies in Nigeria. The study examines the effect of corporate social responsibility and financial performance of listed oil and gas companies in Nigeria. The study also examines whether size of the firm moderates the relationship between corporate social responsibility and financial performance of listed oil and gas companies in Nigeria. Data was collected from secondary source (annual reports and accounts) of listed oil and gas companies in Nigeria from 2005-2019. Data were analyzed using regression through the use of STATA version 14. Ordinary Least Square, Fixed and Random effects were adopted for the study. The study found that the CSR is positive and significantly related to financial performance. On the interaction variables, board size has positive and significant moderating effect on the relationship between education and financial performance but negative and insignificant moderating effect on the relationship between health and financial performance. The study recommends that oil and gas companies should increase their spending on education and health since they have positive effects on their financial performance.

Key words: corporate social responsibility, financial performance, firm attributes, firm size

Introduction

Corporate Social Responsibility (CSR) concept is deepening among organizations, scholars, practitioners and societies in Nigeria. CSR is a voluntary integration of social and environmental activities by companies in their business operations and in their interaction with stake holders. Globally, companies do not operate in isolation; they are hosted by communities and therefore the need for business organizations to give back a part of their profits to the society in which they operate (Mgbame & Ernest, 2013). It is regarded as the organizations activity to make sustainable impact in society, and which in turn has the potential to create positive effect on the business organizations, to look good in front of customers and other stakeholders and to create reputation and goodwill. Governments play an important role in uplifting the standards of living of its citizens through provision of social amenities. To ensure accountability and focus in CSR, organizations introduce should foundations to channel their philanthropic contributions (Paul, 2013).

The size of a business enterprise affects different things in the business, such as the goodwill, customer loyalty, patronage as well as its level of responsiveness to the stakeholders. The size of the business will determine the shareholder base as well as the capital base of the business which informs the level of stewardship expected from the managers of the business and the board of directors. Small Size Company may not necessarily publish its reports and when this is done, it may be as a result of the statutory requirements. However, large companies because of the large number of shareholders and the diverse background of its shareholders will be forced to disclose all necessary information, so as to retain and enhance its goodwill, investment and attract more investors to the company.

The oil and gas sector in Nigeria is one of the vital industries in the world, largely because of its strategic role in every economy and the world at large (Faure & Wang, 2004). The distinctive features that characterized the industry are derived from the nature of crude oil, its operations and commercial arrangements. Some of these characteristics include high level of risk and uncertainty, dominance of the world economy, long lead-time between investment and returns, significant regulations by government authorities, technical and operational complexity, specialized accounting rules for reporting and complex tax rules and lack of correlation between investment and value reserves among others (Faure & Wang, 2004).

Furthermore, most of the studies carried out in Nigeria either investigated the direct relationship between CSR and firm performance (Karaye, 2010; Dandago & Muhammad, 2011; Uadiale & Fagbemi, 2011; Babalola, 2012; Akinpelu et al., 2013; Adewale & Rahmon, 2014; Amahalu & Yusuf, 2016). From the foregoing, this study examines the moderating effect of firm size on the relationship between CSR and financial performance in the listed oil and gas companies in Nigeria with a view to determine the extent to which size of the moderates this relationship, as well as, understanding how CSR can be used to enhance firm's performance in the listed oil and gas companies Nigeria.

The main objective of this study is to examine the moderating effect of firm size on the relationship between CSR and financial performance in the listed oil and gas companies in Nigeria. Findings of this study are of significance to researchers, policy makers, managements of the firms in the selected industry and regulatory bodies. Researchers and students may benefit from this study because it is available for literature review and reference materials showing the gaps that serve as a frontier for further studies. The study's findings would have policy implications for emerging economies such as Nigeria, by clearly stating the implications of companies undertaking CSR activities. Also, the study provides information to the management of firms in the listed oil and gas sector in Nigeria, which is needed for planning, decision-making, control and in effect enhance their financial performance.

Conceptual Review

Financial Performance is an actual account of the financial status of the firm as reported to regulators and presented to shareholders, it is the reliable information sought by analysts and investors to justify their advice and decisions and it is the figure that market will seek to see to inquire about stakeholders' economic interests in a company (Querol-Areola, 2017). Furthermore, financial performance is a measure of an organization's earnings, profits and appreciation in its value which are reflected by the rise in price of the entity's shares and the degree to which financial objectives are being met or has been accomplished (Ibrahim, 2019). The financial health of a firm is determined by its performance. It also connotes how the firm's resources and assets are being put to use (Delen *et al*., 2013).

Financial performance can be defined as a measure of a firm's, profits and earnings which is reported to the stakeholders, determine the firms and can also be compared with similar firms across the same industry or be used to compare industries or sectors in aggregation. The firm's financial performance is very vital in the growth and survival of an organization. For an organization to survive and prosper as well to accomplished its objective, financial position need to be enhanced to achieve that purpose. Also, a firms with significant positive financial performances should be in better position to engage in CSR practices to its immediate communities and this will increase firm reputation and goodwill.

Corporate social responsibility is generally referred to as implied obligations of a firm to protect and improve social welfare of the stakeholders and community hosting it in the present as well as in the future, by creating sustainable welfares and development initiatives (Lin, 2019). CSR could be defined as the communication and flow of information on both economic, social and environmental issues and their related impact on an organizational economic performance directly or indirectly in relation to an interest group in a given society (Sharp & Zaidman, 2010).

Size is an important predictor of financial performance. Bigger companies seem to have better profitability, more efficient and talented administration than the smaller firms (Abbasi & Malik, 2015). Also, Chin (2015) and Vijayakumar and Tamizhselvan (2010) asserted that

organizational size is having a significant impact on performance. Firm size is an important variable because large companies may promote CSR strategies more often than small firms.

Empirical Review

Several researchers have investigated the relationship among corporate social responsibility, financial performance and firm attributes. Different methodologies were adopted by different authors using data from different countries and as such arriving at different conclusions. Yusuf (2016) examines the impact of CSR activities on financial performance of Listed Industrial Goods Companies in Nigeria. The result of the study shows that charitable donation, education and skills acquisition expenditure have positive and significant impact on the financial performance of listed industrial goods companies in Nigeria.

Awan and Muhammad, (2018) examined the impact of corporate social responsibility (CSR) on the financial performance of commercial banks from 2011-2015. Secondary data for CSR, ROA and ROE is collected from annual reports of commercial banks and Stock returns data is collected from Pakistan stock exchange website. Slack resource theory, Good management theory and stakeholders' theory of CSR are used in this study. There are 47 banks, operating in Pakistan which consists of 5 public sector banks, 18 private banks, 6 Foreign banks, 4 specialized banks and 14 microfinance banks. The sample size for this study is all banks, whose data for 5years will be available with purposive sampling technique. Non-probability sampling technique is used to collect data. Financial performance is measured by ROA, ROE, Stock returns. The study found that there is significant positive impact of CSR on ROA and ROE.

Also, Elif & Halil, (2017) conducted a study on the relationship between firm performance and corporate social responsibility (CSR) of firms listed on Borsa Istanbul during the period of 2009-2011. The financial performance variables in the study comprise ROA and ROE. The study revealed that there is a negative relationship between CSR and financial performance. Flammer (2015), examined whether Corporate Social Responsibility leads tosuperior financial performance in United Kingdom using regression discontinuity approach. The study made findings that CSR activities lead to negative financial performance.

Firm size and Financial Performance

Lukman, (2017). This study investigated the effect of firm size on the performance of firms in Nigeria. The study uses a panel data set of 12 non-financial firms operating in Nigeria in the period 2005-2013. The panel data are analysed using a pooled regression model, fixed effects model and random effects model to identify the relation- ship between firm size and the performance of firms listed on the Nigeria Stock Exchange (NSE). Return on equity is used as a proxy for performance, which serves as the dependent variable. Total assets and total sales are

the proxies for firm size, and the control variables are leverage and working capital. The results of the study reveal that firm size in terms of total assets has a negative effect on performance, while in terms of total sales, firm size has a positive effect on the performance of Nigerian non-financial companies.

Olawale *et al.*, (2017) conducted a study to investigated the effect of firm size on the performance of firms in Nigeria using panel data set of 12 non-financial firms operating in Nigeria in the period of 2005-2013 and analyzing the panel data using a pooled regression model, fixed effect model and random effect model to identify the relationship between firm size and the performance of firms listed on the Nigeria stock exchange. The result of the study reveals that firm size in terms of total asset has a negative effect on performance while in terms of total sales firm size has a positive effect on performance. Also, Ngumo *et al.*, (2017) examined the determinants of corporate financial performance of microfinance banks in Kenya, adopting a descriptive research design and used secondary data from 7 banks for a period of 5 years from 2011 to 2015. The data collected was analysed using correlation and regression analysis and found statistically significant relationship between firm size and financial performance.

Muhindi and Ngaba (2018). The study was conducted to determine the effect of firm size on financial performance of commercial banks in Kenya. The study used a descriptive survey. The variables entailed; the number of branches, capital base, number of customer deposit and the loan and advances. The population of the study constituted all the 42 registered commercial banks in Kenya and 1 mortgage finance company. The data was gathered from the bank's financial reports and central bank supervision reports for 5 years' period from 2012-2016. The study use of secondary data and data were analysed using multiple linear regressions method. From the discussion of the findings above, it can be concluded that there is a significant relationship between firm size and financial performance of commercial banks in Kenya.

Karlsson *et al.*, (2015) examined the moderating effect of firm size on the relationship between CSR and financial performance – A quantitative study examining the Stockholm OMX stock exchange. The population of the study comprises of 311 companies examined between 2006-2009 by the Swedish insurance company Folksam in its Index of Corporate Social Responsibility (FIFCR) from where the sample size of 250 companies on the Swedish Large-, Mid- and Small Cap stock exchange (on the Stockholm OMX stock exchange market) were selected during the period and examined in this study. The financial data utilized in this research is collected from participating companies' annual reports which includes data which enables calculations of the dependent variables of ROA and Tobin's Q. The study found that that firm size negatively moderates the relationship between CSR and financial performance.

Furthermore, Yeon and Lim (2016) analyzes the moderating effect of firm size and board size on the relationship between CSR and financial performance of listed companies in Korean for the period 2008-2013. CSR index was used as measure of CSR; ROA was used as proxy for financial performance, while number of employees, size, debt ratio and R&D expense

were used as control variables. Descriptive statistics and moderator regression model were used as techniques for data analysis. The results show that CSR has a significant positive effect on financial performance and that firm size and board size has a significant positive moderating effect on the relationship between CSR and the financial performance of the companies.

Methodology

The ex-post facto research design was adopted for this study employing the quantitative research methodology. The study utilized secondary source of data, where data on the dependent, the explanatory and the moderating variables was extracted from the annual reports and accounts of the selected firms. The population of the study consists of all the eleven (11) oil and gas companies that are quoted that are listed on the Nigeria Stock Exchange as at 31st December 2019. This is shown on Table 1 in appendix A.

The working population of the study was selected based on three selection criterion. The application of this criterion was made thus: (1) Only those companies who have been in operation within the period of study 2005-2019 was considered as appropriate sample of the study (2) A company must have published their financial and annual reports and account in the period under study (3) The company must have been quoted without being delisted between 2005 and 2019.

As a result of this filter, the number of oil and gas companies in the population has been reduced to (7) to arrive at sample size of the study.
This study used three set of variables: dependent, explanatory (consisting of independent and control variables) and moderating variables. Consistent with similar previous studies, measures pertaining to CSR, financial performance and board size were adopted from the works of Kruders (2018) Kordloie and Shahverdi (2018).

Furthermore, return on assets (ROA) was used as a proxy firm's performance (the dependent variable). This variable has been used extensively in the literature to serve as proxy firm's performance and is computed as follows;

ROA = (Total Market Value of Firm+Book Value of Debt) / Total Asset Value of Firm.

CSR (the independent variable) is measured by cost on education and cost on health as used by previous researches by Yusuf (2016) and Hashim, Ahmad and Huai (2019). The size of a company is mostly measured by the natural log of a firm's total assets, which is in line with previous studies such as (Gamerschlag *et al.,* 2011; Inoue & Lee, 2011; Makoto & Pascal, 2011; Kang *et al.,* 2012; Zahid *et al.,* 2013; Wang & Sarkis, 2017) all measured firm size using natural log of total assets.

Age used as a control variable in this study is measured by date of listing in the Nigerian stock exchange as used by Mukthar (2017). Leverage is a control variable measured as total debts divided by total assets as used by Yusuf (2016).

Data gathered for this study was analyzed using descriptive statistics, correlation matrix and multiple regression analysis after robustness tests are carried out on the data. The general models based on the variables of the study are stated thus:

$$ROA_{it} = \beta_0 + \beta_1 CSRCED_{it} + \beta_2 CSRCHE_{it} + \beta_3 AG_{it} + \beta_4 LV_{it} + e_{it} \ldots\ldots\ldots\ldots (I)$$

$$ROA_{it} = \beta_0 + \beta_1 CSRCED_{it} + \beta_2 CSRCHE_{it} + \beta_3 FS_{it} + \beta_4 CSRCED*FS_{it} + \beta_5 CSRCHE*FS_{it} + \beta_6 AG_{it} + \beta_7 LV_{it} + e_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (II)$$

Where: ROA_{it} is proxy for financial performance of firm i at year t,
CSRCED = CSR cost on education; CSRCHE = CSR cost on health; FS Firm Size; AG = Firm age; LV = Leverage; β_0, β_1, …, β_7 are the regression model coefficients of the explanatory variables while e_{it} are the random errors. The model in equation (1) checks for the direct relationship between the dependent variable (ROA) and the independent variables (cost on education and cost on health) including the control variables (age and leverage), without the interaction effects of the moderator (firm size). The model in equation (2) checks for the relationship between the dependent variable (ROA) and the independent variables (education and health) including the control variables (age and leverage), with the interaction effects of the moderator (firm size).

Results and Discussion

The descriptive statistics of all variables of the study is shown on Table 2 in appendix A. From Table 2, the mean ROA for the sampled oil and gas companies average is 0.1179, meaning the average profit earned by the companies which is attributed to the shareholders is 11.79%, of their total assets with a maximum profit of 148% and the minimum loss of -16% of their total assets. The standard deviation of 0.1589 indicates significant dispersion among the sampled companies with regards to return on assets.

CSR cost of education has a mean of 5.77 and the standard deviation of 1.56 respectively. Furthermore, this variable of the study has recorded minimum value of zero (0) and a maximum of 8.37 for all the sampled oil and gas companies within the study period. This indicates that some companies do not incur CSR cost on education while the maximum value of 8.37 indicates a low variation of CSR cost on education among the sampled companies as depicted by the value of standard deviation of 1.56 which is lower than the mean value of 5.77 as shown in the result of the study.

CSR cost of health has a mean of 4.56 and the standard deviation of 2.25. Furthermore, this variable of the study has recorded minimum value of zero (0) and a maximum of 7.31 for all the sampled oil and gas companies within the study period. This indicates that some companies do not incur CSR cost on health. While the maximum value of 7.31 indicates a low variation of CSR cost on health among the sampled companies as depicted by the value of standard deviation of 2.25 which is lower than the mean value of 4.56 as shown in the table. This indicates a low level of dispersion on the annual amount spent on health during the period

under the study as depicted by the value of standard deviation of 2.25 which is lower than the mean value of 4.55 as shown in the result of the study.

Firm size is measured by the natural logarithm of total assets. It has a mean of about 7.83 with a minimum of 6.76 and maximum of 9.03. Also, the standard deviation of 0.47 indicates a low level of dispersion in the total assets among the sampled oil and gas companies. The minimum and maximum value as stated above, implies that the oil and gas companies in the study did not differ significantly in size.

Table 3 in appendix A shows the correlation analysis of all variables of the study. It can be gathered from table 3 that ROA (the dependent variable) is positively correlated with cost on health and leverage and negatively correlated with cost on education, board size and age. This means firm performance proxy as ROA moves in the same direction with cost on health and leverage as the correlation coefficients of dependent variable against these variables are 0.0884 and 0.1747 respectively, while the correlation coefficients of ROA against cost on education and age are -0.1266 and -0.3357. This implies that as cost on health and leverage increase, firm performance also increases and as the ratio of these variables decreases, firm performance proxy as ROA will decreases in the market.

For this study, the VIF was carried out to test for multicollinearity as shown in Table 4 appendix A. The VIF were found to be consistently ranges from a minimum of 1.06 to a maximum of 1.50. VIF of less than 10.00 can still be a proof of the absence of collinearity as shown in the Table 4. Gyimah and Oscar (2011) and Nishida (2019) states that after estimating a model and computing the VIF, any variable with a VIF value of 10 or more indicates harmful co-linearity. From table 3 in appendix A it shows that the VIF of all variables is less than 5. Hence multi co-linearity was not a problem. Normality implies that errors (residuals) should be normally distributed. The result for Skewness and Kurtosis test for the residual show insignificant prob>chi2 value of 0.2137 at 5% level of significance, which suggests that the error terms are normally distributed, neither skew to the left or right.

Hausman specification tests were carried out for the two models of this study as shown in Table 5 Appendix A so as to choose the appropriate model between fixed and random effects. The null hypothesis shows that random effect is preferable and the results show prob>chi2 values of 0.0843 and 0.1678 for the equation 1 and 2 respectively. However, the hausman test for ROA model reveals that the two tests (Fixed and random effect) are not correlated with chi-square probability (p-value) as shown in the results of the models; and hence it rejects the fixed effect in favour of the random effect which indicate that it is prepared in all the models as the p-value has a value higher than 0.05 Furthermore, Breuch-Pagan Lagrangian Multiplier Test (LM Test) were carried out to choose or decide between random effect regression and simple OLS regression. The results show that the random effect test and OLS test are not correlated as evidenced by chi-square probability (p-value) of 0.2401 and 0.2423 for the equation 1and 2 respectively. Hence, it rejects the random effect in favour of the OLS regression. Table 4.1 below summarizes the results of the two models for equation 1 and 2.

Table 1 present the regression result of the third model on moderating effect of firm size on the relationship between CSR and financial performance of listed oil and gas companies in Nigeria

Variables	Pooled OLS(Robust)	Random-Effect	Fixed-Effect
Constant	0.1508*** 4.29	0.1508** 2.41	0.2934** 2.59
Education	0.0090 1.35	0.0900 0.87	0.0613 0.50
Health	0.0081*** 0.95	0.0081*** 1.27	0.0023 0.31
Education* Firm size	0.0409 1.77	0.0409** 2.26	0.0454** 2.21
Health* Firm size	-0.0304*** (-2.76)	-0.0304* (-1.87)	**-0.0287** **(-1.61)**
Firm size	-0.1637*** (-2.71)	-0.1637*** (-4.39)	-0.0794 (-1.06)
Age	-0.0041** (-2.20)	-0.0041** (-2.43)	-0.0097** (-2.29)
Leverage	0.1226 1.10	0.1226* 1.93	0.1285* 1.95
R^2	0.3454	0.3454	0.2461
Adjusted R^2			
F-statistics	2.66	51.17	4.01
Prob. Value	0.0146	0.0000	0.0007
Hausman Test		0.4803	
Breuch-Pagan		0.5870	

Source: STATA Output 14.0 based on data in the Appendix C. NOTE: *, ** and * indicate 1%, 5% and 10% significance levels respectively; the t-value is presented in parenthesis while the other figures represent the coefficient**

Table 1 present the regression result of the third model on moderating effect of firm size on the relationship between CSR and financial performance of listed oil and gas companies in Nigeria. Based on the diagnostic test carried out, robust OLS is a preferred model because the p-value of the LM test is higher than the significant p-value of 5%. The regression result shows a positive and insignificant moderating effect of firm size on the relationship between education and financial performance. Table 1. shows that the overall R^2 as 0.3454 which is the multiple coefficients of determination that gives the percentage or proportion of total variation

in the dependent variable explained by the explanatory variables jointly. Hence it means that approximately 35% of total variation in ROA of listed oil and gas companies in Nigeria are caused by firm size, board size, institutional ownership, age and leverage respectively. The remaining 65% of the total variation in ROA was caused by factors not explained by the model which shows that the model is fit. Furthermore, it shows the F-statistic of 2.66 with the corresponding p-value of 0.000 which is an indication that the model is fit.

From the Table, the result shows that the FA variables (firm size and board size) has positive and insignificant effect on financial performance at significance level of 1%, 5% and 10% with the following coefficients and t-statistics (co=0.0409, t=1.77) and (co= 0.0304, t=-2.76) for education and health respectively.

Also, the regression result reveals negative and significant moderating effect of firm size on the relationship between health and financial performance. Before the moderation education has positive and insignificant effect on financial performance with a coefficient of 0.0090. However, after the moderation, its shows the combined positive coefficient of 0.0409 at 5% significant level. Also, health shows a positive and significant effect on financial performance with a coefficient of 0.0081 but after the moderation, the combined figure shows a negative coefficient of -0.0304, which is statistically significant at 1% respectively. These findings are consistent with the study of Yeon, (2016)**.**

The hypotheses were tested and the result from the analysis shows a positive and insignificant relationship between dependent and interaction variable (education). Also, the regression result reveals negative and significant relationship between dependent and interaction variable (health). For education the null hypothesis is accepted and the alternative is rejected that there is insignificant positive relationship between the moderator (firm size) with the relationship between education and financial performance. The findings are consistent with the study of Yeon, (2016) and Siregar and Bukit (2017).

Also, the null hypothesis is rejected and the alternative is accepted, that there is a significant negative relationship between the moderator (firm size) with the relationship between health and financial performance. The findings are consistent with the study of Karlsson *et al.,* (2015) inconsistent with the study of Peng and Yang (2014).

Conclusion

Based on the study's findings, it is concluded that, CSR board size is positively and significantly related to financial performance in the listed oil and gas sector of Nigeria. Moreover, it is concluded that firm size reveals negative and significant moderating relationship between CSR and financial performance of listed oil and gas companies in Nigeria**.** Also, board size has positive and significant moderating effect on the relationship between CSR cost on education and financial performance but negative and insignificant level on CSR cost on health respectively.

Recommendations

It was recommended that,

1. managements that oil and gas companies should increase their spending on education and health
2. managements that oil and gas companies should ensure a positive effects on their financial performance.
3. managements that oil and gas companies should ensure higher number of members on their board so as to enhance their financial performance.

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Appendix A

Table 1 Listed Oil and Gas Companies

S/N	Name of Company	Year of listing
1	Ardoba oil plc (formerly Forte Oil Plc)	1978
2	Mrs oil Nigeria Plc	1978
3	Total Nigeria Plc.	1979
4	Rake Unity Pet. Comp. Plc	1987
5	Capital oil Plc	1989
6	Conoil Plc. (formerly National Oil Plc.)	1989
7	11 Plc (Mobil Plc)	1991
8	Oando Plc. (formerly Unipetrol Nigeria Plc.)	1992
9	Eterna Oil and Gas Plc	1998
10	Japaul oil and maritime services plc	2005
11	Seplat Petroleum Development company. Plc	2014

Source: *www.ngxgroup.com, 2019*

Table 2 ***Descriptive Statistics of the Variables***

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	105	0.1179	0.1590	-0.1626	1.4815
educ	105	5.7691	1.5558	0.0000	8.3678
helth	105	4.5550	2.2460	0.0000	7.3081
Bsz	105	8.8381	2.8626	4.0000	16.000
Ag	105	26.5714	8.6634	8.0000	42.000
Lev	105	0.5552	0.20778	0.0639	1.2987

Source: STATA output 14.0 based on data collected (2005-2019) Note: ROA= Return on Assets; Educ= Education; Helth = Health; Bsz = Board Size; Ag =Age, Lev= Leverage;

Table 3: Correlation Matrix for all the variables

	roa	educ	helth	bside	age	leverage
ROA	1					
EDUC	-0.1266	1				
HELTH	0.0884	0.3153	1			
FSZ	-0.45	0.1831	0.0769	1		
AGE	-0.3357	0.0674	0.1152	0.1732	1	
LEVERAGE	0.1747	0.066	0.0168	-0.0652	0.0107	1

Source: Correlation Matrix Results using STATA Version 14.0.

Table 4: VIF of all Variables

Variable	VIF	1/VIF
CSR	1.06	0.943396
f.size	1.38	0.724638
age	1.21	0.826446
leverage	1.50	0.826446
Mean VIF	1.29	

Source: VIF Results using STATA 14

Table 5 ***Diagnostic Test***

Model	Multicollinearity VIF test	Heteroskedasticity test	Hausman test	LM test
1	1.06	0.000	0.0843	0.2401
2	1.38	0.000	0.1678	0.2423

Source: Computed by the author from Annual Report data of the sampled companies (2005-2019) Table 5 shows the result of the diagnostic test for the two models.