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Executive Compensation and Performance of Nigerian Manufacturing Firms: A Panel Vector Autoregressive (PVAR) Approach

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Abstract
Some studies find positive relationship between executive compensation and corporate performance, but much of this literature are prone to endogeneity problem and common method bias. Moreover, extant studies provide little information about potential moderating role of managerial power. This study tests the moderating role of managerial power, the degree to which the perceived executive power can influence executive compensation independent of corporate performance. In this analysis, we draw upon panel data from the manufacturing firms listed on the Nigerian Stock Exchange (NSE) during the period from 2010 to 2018. The findings indicate an inverse correlation between compensation and performance. Additionally, there is a positive association between firm size and compensation. The analysis also reveals that the correlation between compensation and performance becomes more pronounced when board size and the presence of non-executive directors influence performance metrics. No such evidence exists when the managerial power variables moderated return on equity. We conclude that consistent with the managerial power theory (MPT), information asymmetry, which gives executives more power relative to the board, makes it easier for executives to influence their compensation independent of actual performance and contrary to the postulate of the agency theory.
Keywords: Executive compensation, managerial power theory, agency theory, performance, PVAR
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Introduction

The perceived excessive levels of executive compensation and its apparent lack of correlation to the performance of the corporations they manage, continues to attract the attention of academics and other stakeholders (Omoregie and Kelikume, 2019, 2017). Contrary to conventional belief, available evidence suggests that firm size may not be a significant determinant of executive compensation. The results of various studies are mixed due perhaps to differences in metrics and methodology employed. However, the weight of evidence in the literature would suggest that executive compensation is more often than not uncorrelated to corporate performance due to the fact that executives have more informational power than the board of directors that provide executive oversight and thus executives are able to negotiate for levels of compensation that do not positively reflect their contribution to performance outcomes (Omoregie and Kelikume, 2019, 2017; Erick et al. 2014; Bebchuk et. al., 2011; Bebchuk and Fried, 2004).

The Managerial Power Theory (MPT) (Bebchuk and Fried, 2004) developed in the last 2 decades has informed a refinement in our understanding of the determinants of executive compensation and its relationship and contribution to corporate performance. Contrary to the pay-performance relationship put forward by the agency theorists, MPT postulates that it is managerial power relative to the board of directors (based on information asymmetry) rather than actual managerial competence induced corporate performance outcomes that drives the compensation of executives. MPT analysis suggests that compensation is less sensitive to performance but more sensitive to managerial power. This submission suggests a complementarity role between compensation and performance in the presence and or absence of managerial power (Van Essen, Otten, and Carberry, 2015).

While there are many empirical studies analyzing the relationship between executive compensation and performance (Omoregie and Kelikume, 2019, 2017; Sheikh et al., 2018; Elsayed and Elbardan, 2018; Olaniyi et al., 2017; Olaniyi and Obembe, 2017; Olalekan and Bodunde, 2015; Faria et al., 2014; Molyneux and Linh, 2014; Faleye et al., 2013; Bebchuk et al., 2011), research effort considering the moderating role of managerial power is still in its infancy. The results from the empirical literature are also by no means conclusive as some

researchers continue to provide mixed results. Many of the studies are also prone to endogeneity problem and common method bias.

In Nigeria, the issue of executive compensation became topical following concerns over the perceived extravagant lifestyles of some bank executive at the expense of the stakeholders they are meant to serve. This necessitated a call in several quarters for the Central Bank of Nigeria (CBN) to regulate executive compensation in the sector. According to the Nigerian Banks Financial Transparency Report 2010, executives of Nigerian banks earn well above what other executives within the continent of Africa earn. Omoregie and Kelikume (2017) find little or no correlation between executive compensation and performance, size or capital base in the Nigerian banking sector. Their finding with respect to the insurance sector was nuanced with profitability variables not having a significant impact on compensation, while efficiency variable was demonstrated to have statistically significant impact on executive compensation (Omoregie and Kelikume, 2019). The need to extend this investigation to other sectors so as to gain deeper insight into the relationship between executive compensation and corporate performance is clearly established.

While some researchers and analysts are of the view that executive compensation serves as an incentive to attract the best hand to manage these firms, others are of the view that it is meant to align the interest of executives as agents with those of shareholders as principals and to prevent fraudulent practices on the part of the executives. This study investigates the relationship between executive compensation and corporate performance in the Nigerian manufacturing sector as an extension to the precious studies in the banking and insurance sectors (Omoregie and Kelikume, 2019, 2017). The rest of the paper is organized as follows; the next section (2) briefly reviews relevant theories and previous empirical studies on the topic. Section 3 describes the methodology adopted in the study. In section 4, we analyze and discuss the empirical results, and finally, the concluding remarks are presented in section 5.

2. Theoretical Perspectives

2.1 *The Agency Theory (AT): Monitoring and Bonding Mechanisms*

The agency theory is a major theoretical underpinning for why the managers / executives are compensated with bonuses and stock options, instead of only the basic salary. Agency theory captures the interactions of the shareholders who delegate managerial tasks to the corporate executive managers (through the board of directors and related governance arrangements), whose actions can affect the performance of the firm thereby affecting benefits that accrue to both parties. The interest of the managers is not always and ideally in alignment with that of the shareholders. Thus, the principal-agent conflicts arise, with the attendant agency costs. In order to maximize shareholders' wealth and appropriately put a check on managers to ensure they are taking risks commensurate with the risk-return preference of shareholders, firms usually find it advantageous to set up monitoring and bonding mechanisms that give managers the incentive to act as better agents.

The monitoring mechanism, however, as suggested by Jensen and Meckling (1976) may serve as a disincentive for managers to search out new profitable investments that would enhance the value of the firm. Thus, this hypothesis indicates an inverse relationship between monitoring and performance. The bonding mechanism of the agency theory, on the other hand, suggests that executive compensation policies can be used by firms to align the interest of managers and shareholders (Gayle et al., 2018; Becher et al., 2005; Mengistae and Lixin, 2004; Murphy, 1999; Jensen et al., 1990). Hoskisson et al., 2009 suggest a complementarity role between the two hypotheses. Accordingly, intense monitoring would mean more pay to compensate the managers for the increased risk-taking associated with monitoring. Hence, the two governance mechanisms found in agency theory, have created a cycle in which managers are compensated excessively, which requires that monitoring become more stringent, and as monitoring becomes more stringent, managers are paid even more. In sum, the agency theory suggests a direct association between compensation and performance, where better firm performance is expected to lead to higher executive compensation (Jensen and Meckling, 1976).

2.2 The Managerial Power Theory (MPT)

The main thrust of MPT is that executive compensation is driven by the managerial power rather than performance as posited by the agency theory. The proponents of this theory (Bebchuk et al., 2002; Lucian et al., 2003; Bebchuk and Fried, 2004) argue that CEOs may have more power relative to the board of directors of a firm thereby being in a better position to negotiate for compensation that serves their interests, rather than compensation driven by performance. Accordingly, when they have power over the board, managers will be better positioned to negotiate for higher pay which may be less sensitive to a firm's performance since they prefer more compensation and less risky business arrangements ((Bebchuk and Fried, 2004; Baker et al., 1988).

However, MPT is based on the assumption of self-interested behaviour for the executive only and not for the board of directors who should act in a good faith for the shareholders.

Van Essen, Otten, and Carberry, (2015) argue that an assumption of self-interested behaviour for the firms' executives could logically make us to predict such likely behaviour for the board of directors. The reasons for such behaviour as discussed by Bebchuk and Fried, 2004 include: (i) director's re-election of which CEOs exerts influence; (ii) social and psychological bonding such as friendship, loyalty, and collegiality between executives and directors; and (iii) director's reward by the executives. These executives' influences may mean that managers can wield more power relative to the board of directors, which better positioned them to negotiate for higher compensation package irrespective of performance. MPT analysis would mean that compensation is not driven by performance (i.e. less sensitive to performance) but rather by managerial power. The analysis may also, suggest a complementarity role between compensation and performance in the presence and or absence of managerial power (Van Essen, Otten, and Carberry, 2015). The recent study of Winter and Michels (2019), as well as their earlier effort in 2012 (Winter and Michels, 2012), argue against the empirical testability of MPT, while Van Essen et al., (2015), whose findings suggest a complementarity role of managerial power for the relationship between compensation and performance, empirically tested in support of the theory.

3. Empirical Evidence

The most studied determinant of executive compensation in the empirical literature is firm performance and the results of the investigations on the relationship between them have been equivocal. In recent literature, authors such as Sheikh et al., 2018; Elsayed and Elbardan, 2018; Olaniyi et al., 2017; Faria et al., 2014; Faleye et al., 2013; Doucouliagos et al.,2012; De Wet, 2012; Ozkan, 2011; Sigler, 2011; Ghosh, 2010; Main, 1991 among others have found a positive relationship between compensation and performance while authors such as Omoregie and Kelikume, 2019, 2017; Olaniyi and Obembe, 2017; Olalekan and Bodunde, 2015; Molyneux and Linh, 2014; Bebchuk et al., 2011; Aduda and Musyoka, 2011; Harris, 2009; etc. have reported a negative relationship between the two variables. Other authors have found no significant or causal relationship between them (Omoregie, and Kelikume, 2017; Yusuf and Abubakar, 2014; Jegede, 2012; Zhou et al., 2011; Jeppson et al., 2009; Kubo, 2001; Main, 1991).

On the positive relationship, Sigler (2011) examines the relationship between CEO pay and company performance for 280 firms listed on the New York Stock Exchange. He finds a positive and significant relationship between total CEO compensation and company performance. Using the Generalised Method of Moments (GMM), Doucouliagos et al., 2012 find that CEO pay is positively associated with lagged performance, with the largest pay-performance effect emerging for long-term incentive pay. Their study also suggests that prior studies seem to have understated the size of pay-performance effects by ignoring the dynamics of data. Sheikh et al., 2018 also made use of GMM on data from non-financial firms in Pakistan and find that accounting performance in the current and the previous year have positive effect on compensation. In the same vein, using univariate OLS multiple regression on data extracted from annual reports of 25 non-financial firms listed on the Nigerian Stock Exchange (NSE) for the period between 2008 to 2010, Hassan and Ahmed (2012) find that corporate governance significantly impacts on both the adjusted and unadjusted firm performance in different magnitudes and directions. Specifically, they reported a positive relationship between executive compensation and firm performance.

Olaniyi et al. 2017 investigated the causal link between executive compensation and firm performance in Nigeria. Using a two-step dynamic GMM model, they reported a bi-directional relationship between CEO pay and firm performance, which implies that compensation serves as a reward and at the same time, a performance motivator. The study of Omoregie and Kelikume (2019) grouped performance measures into two, the profitability measures and the efficiency measures. These authors find that the efficiency measures of performance are significant and positively related to compensation while the profitability measures showed insignificant coefficients. Generally, these studies, based on the agency theory, suggests that compensation effectively aligns shareholders' interests with those of executive managers (CEOs). Hence, firms' stakeholders should focus more on CEO pay as a corporate governance mechanism to reduce agency problems.

Conversely, some studies conclude (based on a negative relationship between compensation and performance) that the compensation does not align CEOs' interest to those of shareholders rather it aggravates the conflict of interest. For instance, the study of Olaniyi and Obembe, 2017 on Nigerian banks made use of the dynamic panel GMM model and find that bank performance, Tobin's Q and board composition had a significant negative effect on CEOs' pay. Besides, this study finds that board size, CEOs' age, and leverage exert no significant impact on CEOs' pay. In a similar effort by Aduda and Musyoka, (2011) for the commercial banks listed on the Nairobi

Stock Exchange, a negative non-significant relationship was found between executive compensation and performance. The study of Omoregie and Kelikume (2017) also reported that executive compensation negatively responds to return on equity using data extracted from the listed Nigerian banks. In addition, these authors find that there is no causal relationship between the performance variables investigated with executive compensation. Similarly, the results of Olalekan and Bodunde (2015) using the dynamic generalized method of moments (GMM) on data from Nigerian banks reveals that CEO pay exerts a significantly negative effect on performance. Molyneux and Linh (2014) investigate how executive compensation affects bank efficiency in China and find that higher compensation to executives reduces bank efficiency while a higher number of unpaid non-executive directors in the boardroom is found to enhance bank efficiency.

Moreover, the empirical literature also discusses the impact of firm size as well as corporate governance variables. Though little attention is paid to this in the literature, governance variables such as CEO tenure, board composition, the board size, CEO age, etc. have been described as factors that can influence executive compensation. These variables have been used as a proxy for managerial power (Winter and Michels, 2019, 2012; Van Essen et al., 2015). For example, Sigler (2011) finds firm size and CEO tenure to be a significant factor in determining executive compensation. Using gross earnings and market capitalization as a proxy for firm size, Yusuf and Abubakar, (2014) reported a positive significant relationship to compensation while they find the performance and governance variables to be insignificant. Additionally, for large UK firms, Gregg et. al., (2012) find that firm size has a huge effect on the level of executive compensation. However, we find evidence of a negative relationship between the variables in the studies of Aduda and Musyoka, (2011) and that of Jegede, (2012). Jegede investigated the effect of compensation and ownership structure on performance from a cross-section of banks in Lagos State Nigeria and finds firm size to be a factor affecting executive compensation with a significant negative coefficient. The study of Aduda and Musyoka reported a similar finding using commercial banks listed on the Nairobi Stock Exchange. While bank size and CEO tenure were found to be key determinants of compensation, Olaniyi and Obembe, (2017) reported that the coefficient of board composition was negative and significant.

4. Methodology

4.1 Population, Sample and Data Source

We focused on data from manufacturing firms quoted on the Nigeria Stock Exchange (NSE) for the period 2010 to 2018. Based on data availability, 19 companies were selected out of 35 classified as industrial or consumer goods. The data were extracted from companies' annual reports collected from their websites. We extracted a balanced panel data for the 19 firms from 2010 to 2018 (9 years) totalling 171 firm-year observations. This sample represents about 54.3% of the study's population.

4.2 Variables, Definitions and Measurements

We collected variables such as CEOs' pay, return on equity, return on asset, earnings per share, total assets, board size, board composition, CEOs' tenure, and CEOs' duality. The selection of these variables was also guided by prior empirical studies. This section briefly discusses the variables employed for the analysis and gives a table of summary (*see Table 1*) on how they are measured with their respective symbol as expressed in the empirical model.

Executive Compensation: This is an important factor to consider when evaluating investment opportunity. It is a bonding mechanism, which is used to align the interests of executive managers to that of shareholders following from the agency theory. Executive compensation is composed of financial compensation and other non-financial awards received by an executive for their service to the organisation.

Earnings per share: It is the portion of a company's profit that is allocated to each outstanding share of common stock. Earnings per share serves as a proxy for the company's financial health and performance. Typically, investors compare the earning per share of two companies within the same industry to get a sense of how the company is performing relative to its peers.

Return on equity: It is a ratio that provides investors with insight into how efficiently a company is handling the funds that shareholders have contributed to it. ROE is a metric of how well a company utilizes its equity to generate profit and it is the ratio of fiscal year net income to total equity, expressed as a percentage.

Return on Assets: The return on assets shows how profitable a company's assets are in generating revenue. It gives a manager, investor, or analyst an idea as to how efficient a company's management is at using its assets to generate earnings. ROA is calculated by dividing a company's net income by total assets. Higher ROA indicates higher asset efficiency.

Board composition: Board composition plays an important role in effective corporate governance and performance. It reflects various degrees of heterogeneity of the board but the common measures include the ratio of independent non-executive directors to total directors on the board. For this study, we employed board size, number of non-executive directors, and number of independent non-executive directors.

Board Size: Board size refers to the total number of directors on the board of each sampled firm. It comprises of CEO and chairman, executive and non-executive directors for each accounting year. The board of director should be an advocate of both management and shareholder interest. All other things being equal, higher size should mean more board effectiveness in checking the excesses of the CEO and relate negatively to compensation (Olaniyi and Obembe, 2017; John and Senbet, 1998). However, this may not always be the case as lack of internal coordination, communication problems, more time and effort to build cohesion in large boards may provide executives with more power over the pay-setting process (O'Reilly and Main, 2010; Bebchuk and Fried, 2004; Eisenberg et al., 1998; Zahra and Pearce, 1989). Hence, we expect that board size will relate positively to compensation and expect the relationship between performance and compensation to be weaker in the presence of board size.

Board Independence: According to managerial power theory, there are a number of ways that independent directors can lose independence and become vulnerable to managerial influence. For instance, the collaboration among directors and managers may intensify over time making independent directors become less willing to challenge executive compensation processes (Macey, 2008; Bebchuk and Fried, 2004). Notwithstanding, based on agency theory, we expect independent directors to be able to constrain managerial power with the argument that boards should have independent directors who are free of the conflicts of interest between the managers and shareholders (Dalton et al., 1998; Zahra and Pearce, 1989). Thus, they would have an incentive to protect their reputations while focusing on improving corporate performance (Van Essen, et al., 2015). We therefore expect the number of independent directors to relate negatively to compensation and the relationship between performance and compensation will be stronger with the moderating role of independent directors. This analysis is taken for the non-executive directors.

CEO Tenure: The longer the tenure of the CEO, the more likely he/she is able to be an important determinant of managerial power i.e., the more powers he may possess to influence compensation package in his/her favour (Olaniyi and Obembe, 2017; Van Essen, et al., 2015; Sigler, 2011a, 2011b). CEO tenure is defined as the number of years that each firm's CEO has held the position. Our a priori expectation is that a positive relationship exist between compensation and CEO tenure and in the presence of this variable, we expect the relationship between compensation and performance to be weaker.

CEO Duality: This occur when the CEO is also the board chairman i.e., an individual has the roles of both CEO and board chairman. According to managerial power theory, this concentration of decision-making power in one individual will lead to more power and more influence over the pay setting processes (Bebchuk and Fried, 2004; Pearce and Zahra, 1991; Ungson and Steers, 1984). CEO duality is expected to relate positively with executive compensation and makes for weaker relationship between corporate performance and compensation.

Firm size: The firm size is measured by the total assets of each firm and it is expressed by the natural logarithms of total assets. CEOs of listed firms usually prefer to link their pay to firm size rather than performance because firm size is more predictable than performance which transfers some risks to them (Gregg et al., 2012 and Tosi et al., 2000). We expect a positive relationship between compensation and firm size and a weaker relationship between corporate performance and firm size.

Table 1: Variable, Measurement and symbol

Variables	Measurement	Symbol
Compensation	This is the total compensation of the CEO (highest paid director) which is the sum of salary, cash bonus, and other long-term compensation in a year	CEOP
Earnings per share	Basic earnings per share is given by profit minus preferred dividends divided by weighted average common shares.	EPS
Return on Equity	It is equal to fiscal year net income divided by total equity, expressed as a percentage	ROE
Return on Assets	ROA is calculated by dividing a company's net income by total assets. Higher ROA indicates more asset efficiency.	ROA
Board size	Total number of directors on the board of each firm. It comprises of CEO and chairman, executive and non-executive directors for each accounting year.	BS
Board Independence	NED is the total number of non-executive directors in the board INED is the number of directors who are independent in the board	NED INED
CEO Tenure	CEO tenure is given as the number of years that each firm's CEO has held the position.	CEOT
CEO Duality	This a measure of whether an individual is both the CEO and the chairman of the board	CEOD
Firm Size	It is measured as the logarithm of firm's total assets	LASET

4.3 Estimation Techniques

This study is conducted in panel data framework. Panel data analysis has some advantages over time series and cross-sectional estimates. Generally, more and diverse information gives an increased precision of estimates. Multicollinearity, aggregation bias, and simultaneity problems associated with time series data can also be avoided (Jakobsen and Jensen, 2015; Favero and Bullock, 2014; Hsiao, 2007). The study adopts descriptive analysis to study the distribution of the data and econometric method of analysis to examine the relationship between executive compensation and performance. Preliminaries tests such as panel unit root test and the cointegration test on our data implies that we use a panel vector autoregressive (PVAR) model. For the unit root, the study employed the common homogenous panel unit root test of Levin, Lin, and Chu (LLC) and an heterogenous test of Choi. The LLC use pooled tests which are very restrictive while the heterogenous use group mean tests which are more general in nature. We then adopt the Kao-Engle and Granger based cointegration test as proposed by Kao et al. (1999) to establish the long-run relationship among the variables. Lastly, we estimate a panel pooled regression to ascertain the moderating roles between managerial power and performance in relation to executive compensation.

4.3.1 Statistical Models - PVAR model

Common issue with a panel analysis is the presence of heterogeneity across the cross-sections (Arellano and Bover, 1995). The PVAR framework analyses the time and cross-sectional variation in a dataset and has the advantage of taking into consideration unobserved individual and time heterogeneity (Love and Zicchino, 2006). As with standard VAR models, all variables in the PVAR model are expressed as lag model of all the endogenous variable (Koutsomanoli-Filippaki and Mamatzakis, 2009). Accordingly, individual specific terms are introduced to account for such difference in parameters which differentiates the PVAR from the standard time series VAR. Therefore, the PVAR model is expressed generally as.

$$Y_{i,t} = \eta_i + \Phi Y_{i,t-1} + \varepsilon_{i,t} \qquad i = 1, \ldots, T. \qquad (1)$$

Where $Y_{i,t}$ represents an [m x 1] vector of random endogenous variables, Φ represents an $[m \times m]$ matrix of parameters to be estimated, η_i is an [m x 1] vector of individual fixed effects, and $\varepsilon_{i,t}$ is an [m x 1] vector of white-noise error terms. Estimation of the PVAR model follows the system-based generalized method of moment estimator as suggested by Arellano and Bover (1995). Inferences are made based on the impulse response function (IRF) and variance decomposition (VDC) estimation of the PVAR. Estimation of the IRF and VDC requires some level of identification which is tackled by arranging the variables in an order of preference

so as to make sure that the more exogenous variables impact on the more endogenous ones in a sequential order (Love and Zicchino, 2006).

4.3.2 Moderating Effect

The second objective of this study is examining the interactive effect of performance and managerial power on executive compensation. More specifically, the model for the moderating effect is organised hierarchically where the direct associations between performance, managerial power and compensation are analysed first. Then, the possible moderation effect of managerial power is tested by including the interaction terms, created by multiplying the summative individual scores on the variables. Finally, the control variable is included in the analysis. For this purpose, we specify a simple panel model for random and fixed effect as

$$CEOP_{it} = \alpha + \beta(Perf)_{it} + \gamma(Mp)_{it} + \delta(Perf * Mp)_{it}\, \delta(Laset)_{it} + \varepsilon_{it}$$

Where, CEOP represent executive compensation, $Perf$ is the measures of firms' performance; Mp represent the measures of managerial power, $Perf * Mp$ is the interaction terms for the combination of performance and managerial power variables. Other parameters remain as define from the above.

Using a fixed effects panel regression on aggregated data at the organizational level reduces endogeneity issues and common method bias, which include at least parts of omitted variable and social desirability bias (Verbeek, 2008). Because the data are analysed over time, this time variation can be used to control for factors that do not change over time, leaving only the variation that does change left to be explained by the included variables. Recent methodological articles by Favero and Bullock, (2014) and Jakobsen and Jensen, (2015) also suggest that panel analysis is a very effective means to limit the common method bias typically associated with cross-sectional studies using self-perceived performance measures.

5. Estimation Results

5.1 Descriptive Statistics and Correlation Analysis

The descriptive statistics gives information about the sample statistics such as the mean, median, minimum value, maximum value, and the spread of the sample measured by the skewness, kurtosis and Jaque-Bera statistics. All these statistics are used to test for the normality of a distribution. The results of the descriptive analysis are presented in Table 2. The series display consistency as their mean values fall within the minimum and maximum values. The standard deviation value, which is a measure of the degree of variation or dispersion of the variables from their mean, is not high with the highest value being 2.87 percent. This is an indication of less fluctuation in the value of the variables for the sampled firms. CEOD is the most stable of all the series with standard deviation of 0.45 percent followed by ROE with a standard deviation of 0.76 percent. Kurtosis is used to assess the peak of a distribution. The result reveal that variables such as ROA, ROE, INED, and CEOT are leptokurtic (peaked) relative to normal as the kurtosis of this series are greater than 3 while CEOP, EPS, LASET, BS, NED, and CEOD are platykurtic (peaked) as their kurtosis is below 3. The skewness is used to investigate the degree of asymmetry, that is, the deviation from symmetry of a distribution. Accordingly, the analysis shows that CEOP, ROA, ROE, LASET, and CEOD experience more of negative changes than positive and otherwise for EPS, BS, NED, INED, and CEOT.

Table 3 presents the results of pairwise correlation matrix between the variables. With the exception of the pair ROE and ROE, BS and NED, and LASET and BS, the correlation coefficients show that all the pairs give low and moderate value that are less than 0.5. Also, the results show that all the variables are positively correlated to CEOP, suggesting a positive relationship between executive compensation and the explanatory variables except for ROA which show a negative relationship. A high correlation coefficient of 0.848 exist between ROE and ROA as is the case with the pair of BS and NED with coefficient of 0.844. This is an indication that these variables could be used interchangeably in the model.

Table 2: Descriptive Statistics

	CEOP	ROA	ROE	EPS	LASET	BS	NED	INED	CEOT	CEOD
Obs	171	155	155	155	171	171	171	171	171	171
Mean	3.793	2.101	2.888	0.822	24.473	9.8011	6.6842	1.3391	1.7251	0.7017
Median	3.891	2.178	2.861	0.512	24.855	9.0000	6.0000	1.0000	2.0000	1.0000
Max	6.133	3.413	4.138	4.219	28.158	16.000	12.000	5.0000	6.0000	1.0000
Min	0.693	-0.812	0.211	-1.966	19.980	4.0000	0.0000	0.0000	0.0000	0.0000
Std. Dev.	1.255	0.812	0.765	1.396	1.8423	2.8730	2.6132	1.2563	1.0177	0.4588
Skewness	-0.422	-0.765	-0.618	0.499	-0.5071	0.1195	0.0400	0.8933	1.0731	-0.8820
Kurtosis	2.623	3.887	3.814	2.567	2.7927	2.1588	2.8864	3.3466	4.8700	1.7779
J-B	6.101	20.245	14.157	7.647	7.6369	5.4486	0.1376	23.603	57.736	32.812
(Prob.)	(0.047)	(0.000)	(0.000)	(0.021)	(0.021)	(0.065)	(0.933)	(0.000)	(0.000)	(0.000)

(a)The Jarque-Bera (JB) is based on a null hypothesis of normality with p-value in bracket. (b)The Skewness and kurtosis have the value of 0 and 3 for normal distribution

Table 3: Correlation matrix

Variable	CEOP	ROE	ROA	EPS	LASET	BS	NED	INED	CEOT	CEOD
CEOP	1.000									
ROE	0.029	1.000								
ROA	-0.031	0.848	1.000							
EPS	0.007	0.242	0.199	1.000						
LASET	0.403	0.252	0.210	0.234	1.000					
BS	0.347	-0.004	-0.029	0.176	0.678	1.000				
NED	0.351	-0.064	-0.072	0.061	0.445	0.844	1.000			
INED	0.484	0.104	0.110	-0.015	0.437	0.489	0.475	1.000		
CEOT	0.120	0.109	0.094	0.156	0.248	0.234	0.166	0.128	1.000	
CEOD	0.139	0.228	0.178	0.113	0.343	0.262	0.293	0.247	0.150	1.000

5.2 Panel Unit Root and Cointegration Tests

In a bid to establish the stationarity properties of our variables, we adopt the LLC and ADF- Choi unit root tests. Table 4 presents the results of unit root tests and the Kao cointegration test results. Based on the results from the LLC, all variables are stationary at levels except for CEOP and CEOD that are non-stationary with individual intercept. Similarly, the ADF Choi Z stat show that CEOP, EPS, LASET, NED, and INED are not stationary with individual intercept. However, all the series are stationary at levels with the exception of CEOD considering individual intercept and trend. The stationarity of the series is denoted by the asterisk signs on the test values and P-values in parenthesis. Nevertheless, we can conclude stationary for the variables since they do not conflict on both cases of estimation (i.e., Individual Intercept and Individual Intercept and Trend) and proceed to adopt the Kao residual-based cointegration test. The Kao test shows that there is no cointegration among the variables as the probability value is greater than 5 percent. Thus, we cannot reject the null hypothesis of no cointegration. Therefore, we move on to estimate the PVAR model to establish the relationship between the variables.

Table 4: Panel unit root and cointegration tests

	LLC		ADF Choi Z-stat		Decision
	Individual Intercept	Individual Intercept and Trend	Individual Intercept	Individual Intercept and Trend	
CEOP	2.49(0.993)	-3.07(0.001) ***	-2.45(0.994)	-2.64(0.043) **	I (0)
ROE	-7.42(0.000) ***	-7.16(0.000) ***	-3.25(0.000) ***	-11.40(0.080) *	I (0)
ROA	-8.06(0.000) ***	-7.44(0.000) ***	-2.95(0.001) ***	-1.44(0.074) *	I (0)
EPS	-6.07(0.000) ***	-10.99(0.000) ***	-1.11(0.132)	-1.81(0.034) **	I (0)
LASET	-4.26(0.000) ***	-11.68(0.000) ***	0.07(0.530)	-1.75(0.039) **	I (0)
BS	-3.42(0.003) ***	-7.71(0.000) ***	-1.31(0.093) *	-1.89(0.029) **	I (0)
NED	-3.10(0.000) ***	-7.50(0.000) ***	-0.95(0.170)	-1.67(0.046) **	I (0)
INED	-1.39(0.082) *	-8.12(0.000) ***	1.43(0.924)	-1.69(0.045) **	I (0)
CEOT	-4.49(0.000) ***	-7.23(0.000) ***	3.52(0.001) ***	2.92(0.020) **	I (0)
CEOD	-1.04(0.147)	-4.05(0.000) ***	-0.01(0.042) **	0.48(0.686)	I (0)
Kao-Engle and Granger cointegration					
Kao-ADF t-statistic		-1.4351	0.1736		

*Source: Authors computed. ***, ** and *: Denote significance at 1%, 5% and 10% levels, respectively.*

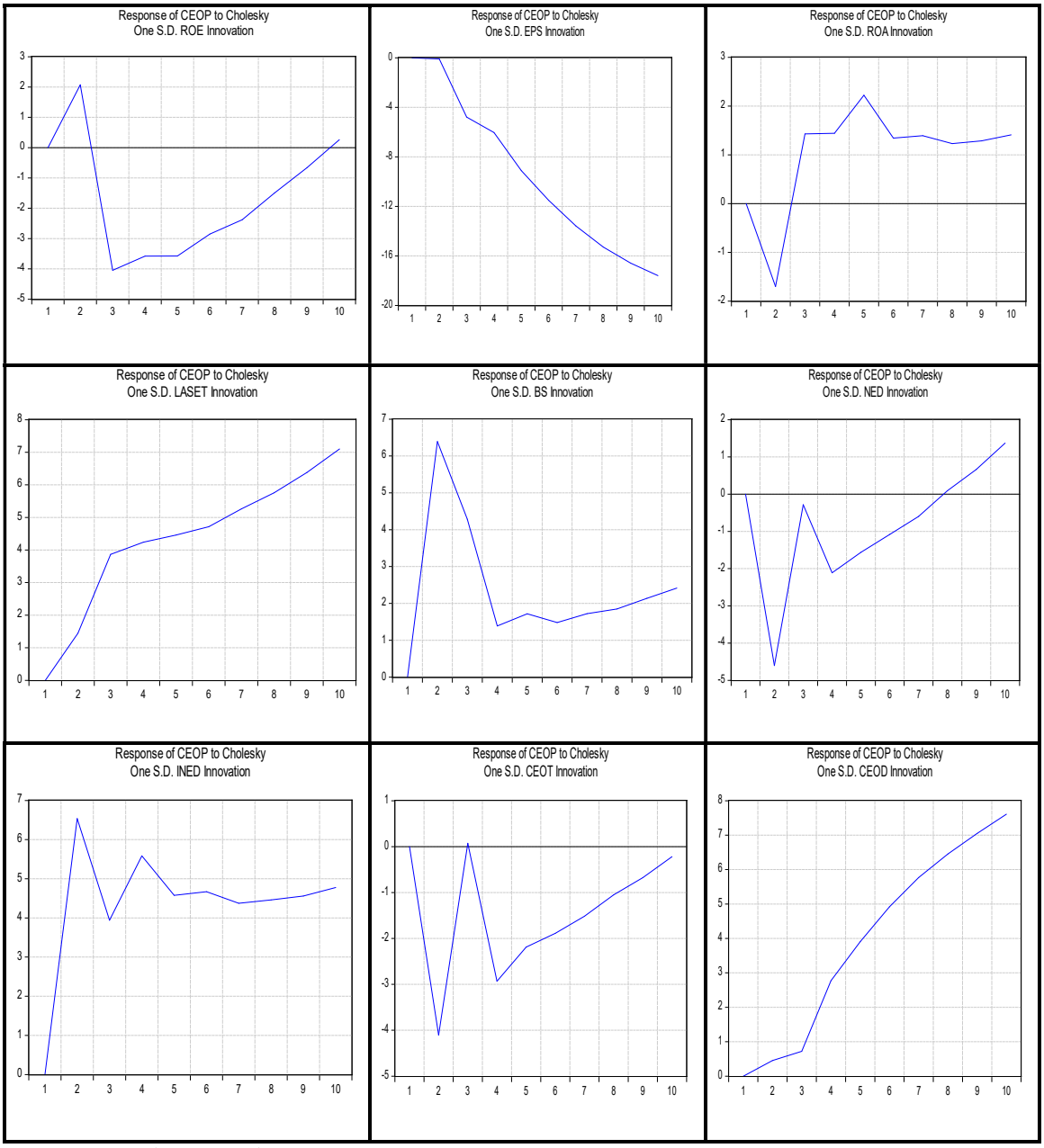
5.3 PVAR Estimation and Causality

5.3.1 Impulse response

The results of impulse response of CEOP to the variables in our model is presented in Figure 1. It is revealed that CEOP responds positively to ROE only in the first two horizons and reverses to negative effect from the third horizon. This indicates a negative influence between CEOP and performance as measured by ROE. Similarly, we also observe that CEOP responds negatively to EPS – another performance variable, in all the horizons. However, the variable responds positively to ROA. The figure further shows that LASET influences CEOP positively which is an indication that firm size is a positive determinant of compensation. In the same vein, BS, INED, and CEOD also give evidence of positive relationship with CEOP. On the other hand, NED and CEOT responds negatively to CEOP.

5.3.2 Variance Decomposition (Vdc)

Table 5 through to 8 in Appendix 1 present the contributions of each variable in percentage to variations in the PVAR system with the variance decomposition estimates. The result revealed that INED contributes more to changes in CEOP taking a cue from period 2 through to period 5. This is followed by the contributions of the company's BS in the period 2, 3, 4 and, 5. Then, we have NED following in period 2 and 3 while EPS and LASET follows in period 4 and 5. Although not substantial, the result indicates that managerial power variables contribute more to changes in CEOP than performance variable. But then, only CEOP contributes to changes in ROE in the first period. EPS contributes more to changes in ROE followed by CEOT, LASET, and INED in that order. ROE contributes over 67% of changes in ROA. The VDC results showed that LASET contribute 10.2% on the average to change in EPS on the average. This is followed by the contribution of ROE, ROA, and CEOD in that order.



Source: Authors computation

Figure 1: Impulse response of Executive Compensation

5.4 Moderating Effect of Performance and Managerial Power on Compensation

This study also examines the moderating (interaction) effect of managerial power variables with performance on executive compensation. Using the random and fixed regression analyses, the results of the analysis are provided in Table 5 where CEO pay is used as the dependent variable. The independent variables include measures of performance and managerial power as well as the interaction terms between them. As displayed in the table, the value of F-statistic is highly significant which implies that our regression model has explanatory power and

policy conclusions can be made based on the result. The value of coefficient of determination shows that the model fits the data reasonably well in all the estimation.

Specifically, the estimated coefficients for the interaction terms between return on equity and managerial power indicators (i.e., ROE*BS, ROE*NED, and ROE*CEOD) are not significant in both the random and fixed effects estimations. This suggests that managerial power has no moderating role with performance to affect compensation. With earnings per share as the performance variable, however, board size and number of non-executive directors indicates that moderating role exist between performance and power as the coefficients of EPS*BS and EPS*NED are found to be significant. The significant coefficients indicate that board size and number of non-executive directors serves to moderate power in influencing executive compensation. In the presence of board size and non-executive directors, the contribution of return on equity and earnings per share to compensation increases.

Table 5: Moderating Effect of Performance and Managerial Power on Compensation

Variables	*Random Effect* (i)	(ii)	(iii)	*Fixed Effect* (i)	(ii)	(iii)
ROE	-0.868 **	-0.840	-1.098 ***	-0.636 *	-0.202	-0.845 **
	[2.41]	[0.68]	[2.98]	[1.93]	[0.22]	[2.66]
EPS	0.384	0.425	5.516 *	0.480	0.554	8.476 ***
	[0.48]	[0.52]	[1.93]	[0.61]	[0.66]	[3.01]
BS	-0.967	-1.293	2.307	-0.530	-0.621	4.804
	[0.18]	[0.24]	[0.40]	[0.08]	[0.09]	[0.67]
NED	9.564	7.696	5.474	14.23 ***	12.46 **	8.546 **
	[1.58]	[1.07]	[1.12]	[3.09]	[2.33]	[2.75]
CEOD	-7.292	4.910	9.725	-5.761	8.902	10.89
	[0.26]	[0.20]	[0.40]	[0.22]	[0.37]	[0.49]
LASET	30.89 ***	32.62 ***	28.6 ***	66.61***	67.12 ***	63.79 ***
	[3.90]	[4.26]	[2.96]	[4.28]	[4.06]	[4.11]
ROE*BS		-0.054			-0.070	
		[0.23]			[0.37]	
ROE*NED		0.140			0.111	
		[0.61]			[0.49]	
ROE*CEOD		-0.688			-0.800	
		[0.71]			[1.02]	
EPS*BS			-1.118 *			-1.339 **
			[1.89]			[2.86]
EPS*NED			1.525			1.562 *
			[1.63]			[2.01]
EPS*CEOD			-2.660			-3.255
			[0.81]			[1.21]
Constant	706.5 ***	-739.5 ***	674.0 ***	1622.5 ***	-1629.8 ***	-1587.8***
	[4.23]	[4.29]	[3.31]	[4.12]	[3.90]	[4.11]
R^2	0.3375	0.3468	0.3835	0.3660	0.3752	0.4150
Prob > F	0.000***	0.000 ***	0.000 ***	0.000 ***	0.000 ***	0.000 ***
Observations	171	171	171	171	171	171
No. of Company	19	19	19	19	19	19

Note: Figures in parenthesis are /t-values/. (***), (**) and (*) indicates significance at 1%, 5% and 10% respectively

5.5 Discussion and Recommendations

Findings from the PVAR shows that executive compensation responds similarly to return on equity and earnings per share. Contrary to theoretical expectation of positive effect, where better firm performance is expected to lead to higher executive compensation (Jensen and Meckling, 1976), we did not find this to be the case. This suggests that increasing return on equity and earnings per share does not drive compensation. Basically, the results are contrary to the bonding mechanism of the agency theory which suggests that executive compensation policies can be used by firms to stir the managers interest in alignment to that of the shareholders (Gayle et al., 2018; Becher et al., 2005; Mengistae and Lixin, 2004; Murphy, 1999; Jensen et al., 1990). Our finding reveals an inverse relationship between performance variables (i.e., EPS and ROE) and executive compensation (CEOP). The implication of this is that compensation does not appear to align the interests of shareholders and firms' executive managers. The results may also imply that there are no contractual agreements that link the performance of the CEOs to their compensation. Consequently, and in agreement with managerial power theory,

CEOs have the tendency to influence their payment without consideration to corporate performance outcomes. Similar finding can be found in the studies of Omoregie and Kelikume, 2019, 2017; Olaniyi and Obembe, 2017; Olalekan and Bodunde, 2015; Molyneux and Linh, 2014; Bebchuk et al., 2011; Aduda and Musyoka, 2011; Harris, 2009, who found negative effect of performance on compensation.

Assessing the relationship between executive compensation and managerial power, we also inferred from the results that board size (BS) and CEO duality (CEOD) have positive effect on compensation (CEOP) while the number of non-executive directors (NED) relate negatively to compensation. These three variables conformed to our a priori expectations. On the other hand, the number of independent non-executive directors (INED) and CEO tenure (CEOT) doesn't conform to theoretical prediction with INED showing positive effect and CEOT showing a negative relationship to compensation. Specifically, the positive relationship between CEOP and CEOD suggests that there is concentration of decision-making power in the hand of CEOs. This means that they have more power and influence over the pay setting processes. In this situation, CEOs are expected to have a high compensation irrespective of performance. Similarly, board size also revealed a positive effect to compensation, evidence of the presence of managerial power. The result implies that the size of the board does not necessarily mean less influence for the executive in the pay-setting processes as lack of internal coordination, communication problems, more time and effort to build cohesion among boards members may provide executives with more power (O'Reilly and Main, 2010; Bebchuk and Fried, 2004; Eisenberg et al., 1998). The findings corroborate that of (Van Essen et al., 2015).

Considering the relationship between the number of non-executive directors and compensation, the PVAR result showed a negative relationship. This result is in agreement with the above explanation i.e., it is managerial power and influence that matter and not necessarily the size of the board. In this case, the non-executive directors are more powerful and effective in their monitoring activities. The negative effect indicates that the non-executive directors on the board serves as a check on the pay setting process and seek to align executive compensation with performance. Olaniyi and Obembe, 2017; Gregg et al. 2012 have reported a similar result for the relationship between the proportion of non-executive board members and compensation. In the same vein, two out of the five indicators of managerial power, (i.e., independent non-executive directors and CEO tenure) does not conform to theoretical expectation. The relationship between compensation and board independence is positive. This is contrary to the proposition of the agency theory that predict a negative influence between compensation and board independence. It is argued that the presence of directors who are independent and free of conflicts of interest will act to ensure balance in the executive compensation (pay-performance) setting process (Dalton et al., 1998). Our result suggests that this is not always the case as the independent directors can become vulnerable to managerial influence. Also, CEOT revealed a negative effect on CEOP. The result is contrary to the hypothesis that long tenure gives CEOs the power to influence their compensation packages. Thus, CEO tenure is not related with higher compensation.

Lastly, firm size serves as the only control variable in the analysis and the result suggests that compensation is positively related to it. This result indicates that firm size is a major factor influencing executive compensation. Hence, the CEO of larger firms will earn more than their relative smaller ones. This finding is in consonance with those of Olalekan and Bodunde, 2015; Yusuf and Abubakar, 2014; Faria et al., 2014; Gregg et. al., 2012; Sigler, 2011 whose studies also reported a positive relationship between compensation and firm size while authors such as Aduda and Musyoka, (2011) and Jegede, (2012) reported a negative relationship between the variable.

6. Conclusion

This study examined the pay-performance relationship in the Nigerian manufacturing sector. Using annual data from nineteen (19) manufacturing firms over the period 2010 to 2018, stationarity tests were carried out for the series with the LLC and Choi Z-statistic unit root while the KAO residual cointegration test was employed to ascertain the long run properties of the variables. The unit root result shows that the variables are stationary at level while the KAO residual cointegration showed that long-run relationship exists among the variables used. Our use of fixed effects panel regression reduces the risks regarding endogeneity issues such as omitted variable or social desirability bias, and this makes us more confident in our results.

Descriptive analysis and PVAR model using the impulse response and VDC were used to establish the links between the variables. The results show that performance variables (return on equity and earnings per share) do not drive compensation as CEOP respond negatively to them. The implication is that profitability variables are

not important in the decision of CEO compensation. However, managerial power variables seem the most important driver of compensation. We therefore recommend that boards should be setup to ensure a power balance between the executives and the board by for example restricting extensive tenure and duality for CEOs, ensuring heterogeneity and diversity on the board and enduring that independent non-executive directors who are less influenced by the executives are well represented on the board. Deliberate efforts should be put in place to ensure that executive compensation is aligned with the interest of the shareholders and driven by improved corporate performance.

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8. Appendix

Table 5: Variance Decomposition of CEOP, ROE, ROA, and EPS

Period	S.E.	CEOP	ROE	ROA	EPS	LASET	BS	NED	INED	CEOT	CEOD
CEOP											
1	55.12	100.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	70.92	97.39	0.085	0.057	0.000	0.059	0.779	0.480	0.806	0.335	0.004
3	84.33	96.87	0.290	0.069	0.323	0.323	0.763	0.356	0.747	0.237	0.010
4	95.35	96.20	0.368	0.077	0.607	0.463	0.654	0.376	0.876	0.279	0.092
5	105.2	95.37	0.417	0.108	1.287	0.574	0.514	0.364	0.873	0.273	0.213
ROE:											
1	14.34	0.556	99.44	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	16.96	0.443	94.48	0.029	1.272	0.001	1.125	0.000	0.016	1.574	1.048
3	18.43	0.375	88.73	0.238	3.891	1.296	1.047	0.131	0.977	2.203	1.101
4	19.67	0.454	82.54	1.188	7.242	2.005	1.516	0.116	1.660	2.307	0.967
5	20.72	0.615	77.69	1.604	9.874	2.504	1.995	0.107	2.228	2.456	0.919
ROA:											
1	6.627	0.063	63.03	36.89	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	8.138	0.148	69.86	26.41	0.375	0.654	0.169	0.021	0.918	1.077	0.349
3	8.799	0.600	68.59	24.64	1.361	0.895	0.151	0.147	1.336	1.953	0.314
4	9.371	0.848	66.44	23.14	2.556	1.049	0.533	0.312	1.830	2.751	0.523
5	9.813	1.163	64.57	21.88	3.869	1.117	0.874	0.307	2.130	3.213	0.866
EPS:											

1	9.432	0.021	3.835	0.511	95.63	0.000	0.000	0.000	0.000	0.000	0.000
2	11.24	0.131	4.314	0.363	84.49	8.797	0.013	0.387	0.011	0.231	1.257
3	12.95	0.274	3.711	1.228	82.88	9.784	0.369	0.348	0.125	0.311	0.962
4	14.09	0.287	3.496	1.121	81.64	10.89	0.706	0.559	0.133	0.324	0.820
5	14.98	0.452	3.133	1.155	80.77	11.51	0.910	0.657	0.376	0.287	0.736

Table 6: Variance Decomposition of LASET and BS

Period	S.E.	CEOP	ROE	ROA	EPS	LASET	BS	NED	INED	CEOT	CEOD
LASET:											
1	0.268	0.325	1.036	0.912	0.000	97.72	0.000	0.000	0.000	0.000	0.000
2	0.401	2.130	6.182	2.913	0.214	86.68	0.202	0.391	0.167	0.232	0.874
3	0.503	4.770	9.423	2.518	1.098	79.56	0.135	0.441	0.193	0.174	1.682
4	0.604	7.793	9.951	2.282	1.730	74.34	0.140	0.709	0.298	0.281	2.468
5	0.701	11.07	9.876	2.123	2.251	69.74	0.112	0.862	0.352	0.341	3.256
BS:											
1	1.221	4.481	1.278	1.072	0.477	0.803	91.88	0.000	0.000	0.000	0.000
2	1.613	3.268	1.450	0.839	0.706	2.825	87.09	2.884	0.141	0.711	0.077
3	1.842	2.571	2.167	1.172	2.073	4.774	83.70	2.702	0.110	0.663	0.060
4	2.000	2.193	1.975	1.707	3.195	6.325	80.64	3.203	0.103	0.584	0.063
5	2.121	1.986	1.772	2.133	4.415	7.585	77.93	3.412	0.091	0.562	0.107

Table 7: Variance Decomposition of NED and INED

Period	S.E.	CEOP	ROE	ROA	EPS	LASET	BS	NED	INED	CEOT	CEOD
NED:											
1	1.233	0.928	1.092	0.013	0.010	4.086	42.89	50.97	0.000	0.000	0.000
2	1.509	2.701	2.227	0.318	0.072	3.405	44.29	46.86	0.004	0.006	0.104
3	1.715	2.455	2.745	0.844	0.058	4.659	43.34	45.66	0.121	0.023	0.080
4	1.839	2.522	2.641	1.279	0.050	5.173	42.29	45.64	0.269	0.032	0.085
5	1.934	2.377	2.488	1.706	0.053	5.773	41.57	45.27	0.579	0.035	0.141
INED:											
1	0.610	2.940	0.255	0.005	0.0746	2.052	6.060	2.046	86.56	0.000	0.000
2	0.775	4.990	0.320	1.635	0.291	1.814	7.059	1.427	81.28	0.644	0.529
3	0.914	5.265	2.931	2.153	0.289	1.886	7.311	1.247	76.04	1.565	1.301
4	1.024	5.413	5.516	2.834	0.426	1.949	7.591	1.051	70.39	2.650	2.174
5	1.122	5.268	8.188	3.256	0.624	2.212	7.415	0.926	65.34	3.684	3.077

Table 8: Variance Decomposition of CEOT and CEOD:

Period	S.E.	CEOP	ROE	ROA	EPS	LASET	BS	NED	INED	CEOT	CEOD
CEOT:											
1	1.016	0.081	1.116	1.228	1.789	0.006	0.483	0.484	1.464	93.34	0.000
2	1.074	2.037	1.129	1.130	1.732	1.446	0.444	0.931	1.641	89.50	0.001
3	1.106	1.922	1.115	1.353	2.610	1.920	0.532	1.214	1.816	87.50	0.007
4	1.126	1.871	1.176	1.371	4.272	2.451	0.694	1.687	1.813	84.64	0.016
5	1.148	1.802	1.147	1.320	6.194	3.122	0.897	1.994	2.026	81.46	0.030
CEOD:											
1	0.327	0.213	3.469	0.710	6.889	2.570	0.035	1.388	0.056	1.659	83.00
2	0.401	1.042	5.748	0.582	4.668	1.971	1.309	1.438	0.176	3.724	79.33
3	0.439	1.574	5.693	0.794	3.910	1.813	1.405	1.356	0.167	6.580	76.70
4	0.460	2.664	5.798	0.747	3.574	1.659	1.321	1.235	0.152	7.776	75.06
5	0.473	3.504	6.113	0.711	3.382	1.589	1.252	1.193	0.145	8.625	73.48