

TOWARDS GREENER CORPORATE OPERATIONS: INFORMATION TECHNOLOGY STRATEGY AS MODERATOR OF CHIEF EXECUTIVE OFFICER EQUITY BASED COMPENSATION AND FIRM'S COMPETITIVENESS IN NIGERIA

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Abstract

The current economic realities of the business world require firms to focus on all areas of organizational activities necessary to implementing a chosen course of action. It has been asserted that deploying information technology strategy can be quite helpful in engendering sustainable growth, greener corporate environment, and promoting environmental consciousness. In corporate governance, Chief Executive Officers (CEOs) are saddled with the responsibility of designing firm's strategies for competitiveness and they do this based on their assessment of risk involved, the long term nature, and uncertainty connected with IT strategies. This study therefore examined whether IT strategy moderates the nexus between CEO equity based compensation and firm's competitiveness. To investigate this, the study used firm-level secondary data of 106 quoted firms on the Nigerian Exchange Group for the period 2011 - 2020. Ordinary least square and panel data estimation techniques were used. The Hausman test conducted to choose between fixed effect and random effect models revealed the appropriateness of the random effect model. In the OLS and random effect models, the coefficient of CEO equity compensation was negative, implying that higher CEO compensation is not contemporaneous with higher firm's competitiveness. However, this estimate is not statistically significant and so the weight of this negative relationship is rather insignificant. The introduction of IT strategy as a moderator into the model produced positive interaction effect on firm's competitiveness. Overall, there is the tendency for CEO compensation to enhance firm's competitiveness in the presence of IT strategy. Accordingly, IT enabled greener corporate environment encourages competitiveness and firm's sustainable growth.

Keywords: Agency cost, Bonus pay, Firm's innovativeness, Firm's risk, Stock option

JEL Classification: M12, M15, M52

1. INTRODUCTION

Corporate governance is a mechanism that helps to align shareholders' interest with managerial choices and actions. Monitoring actions by the board of directors, debt holders, or institutional block holders can have an important impact on the economic performance of an organization (Abdul, et al, 2021; Osazevbaru, 2022). A component of governance structure that has attracted intellectual discourse is compensation contract selected for management remuneration (for example, the remuneration level or deciding on performance measures). Accordingly, executive compensation is now a subject of extensive research, and varying views have been expressed on it in the literature (Khan, Waleed, Nouman, & Khurram, 2020; Mehul & Surenderrao, 2016). Whereas no attempt is made in this paper to reproduce the different arguments, it rather focuses on the largely ignored, but crucial subject of equity compensation in relation to firms' competitiveness as moderated by IT strategy in an emerging economy.

Managerial equity incentives, stock compensation, and option compensation are strands of corporate governance that have become controversial to shareholders and stakeholders. As observed in most corporate finance researches on equity-based compensation, useful insights and contradictory findings have been generated (Adam & Schwartz, 2009). Expectedly, many fundamental questions remain unanswered. Specifically, in executive compensation studies, there is the problem of the efficiency, or otherwise, of observed contracting arrangements between organizations and their executives (Banker, Darrough, Huang, & Plehn-Dujowich, 2013; Fenn & Liang, 2001). To contribute to this discourse, this paper follows a traditional agency-theory framework and defines an efficient contract as one that maximizes the net expected economic value to shareholders after transaction or contracting costs and payments to employees.

Obviously, efficient contracts at any particular time or for any sector of the economy are a function of various transaction costs (Wijst, 2018). For instance, when information costs fall greatly along with changes in optimal organizational form, the efficiency of contract is affected. Implicitly, firms will overtime experiment with different contracting technologies as uncertainty surrounds optimal contracting technology (Arker & Mueller, 2002). This uncertainty and differences in beliefs concerning optimal incentive levels will precipitate variations in observed contracts across firms. Compensation contracts are expectedly efficient on average in the absence of systematic bias in beliefs (Khan et al, 2020). Murphy (2012) has argued that labor market discipline eliminates agency problems with CEOs, as they are aware that opportunism is punishable by downward revision of the value of their human capital. However, this line of reasoning assumes absence of information and contracting costs and market friction.

In view of the competitiveness in today's business environment, this study tries to examine the moderating effect of firm's IT strategy on the influence of CEO equity-based compensation on competitiveness. Prior researches on the business

value of IT suggest that IT capabilities to influence firm's competitiveness depend on various external business environmental factors (Chen, Watson, Boudreau, & Karahanna, 2009). Recently, information system research demonstrates that the internal process underlying the impact of IT capabilities is contingent upon competitive intensity (Chan, He, Chan, & Wang, 2012; Chen, Wang, Nevo, Benitez-Amado, & Kou, 2015). These works suggest that moderation analysis will illuminate different CEO compensation forms on the execution of IT-based strategies along different competitive conditions. It should also help increase the sparse research attention given to the impact the business environment has on IT-related corporate practices. Arising from the foregoing, this study hypothesized that IT strategy does not significantly moderate the influence of CEO equity-based compensation on firm's competitiveness

In sum, given the scant attention by prior studies in developing African economies on the impact of executive compensation on competitiveness with the execution of IT strategies, this study contributes to fill this gap by theoretically explaining and empirically demonstrating how the execution of IT strategy would moderate executive compensation impact on competitiveness of a firm in the context of sustainable growth and environmental consciousness.

2. LITERATURE REVIEW

2.1 EQUITY COMPENSATION AND INCENTIVES

Compensation scheme is a means of aligning agent's interest with that of principal (Rijamampianina, 2019; Zandi, Mohamad, Keong, & Ehsanullah, 2019). According to Atunal and Aybars (2018), the causal link between compensation or incentives and performance is obscure. For instance, positive relationship between compensation and performance could be that anticipated better performance motivates equity incentives rather than incentives generating better performance.

Zandi et al (2019) state that there is evidence that CEO compensation has been on the increase worldwide. However, the basic question is: has this reflected on the performance of the firm? It is necessary that CEO compensation policy be designed to align with performance so as to ultimately benefit shareholders addressing this problem. Such design should not ignore variables such as competitors' action, the condition of the market, and the size of the firm.

Equity compensation is generally a non-cash pay offered to an organization's employees to enable them to partake in the firm's ownership. Executive equity compensation is any compensation paid to a director based on the value of the stock of the company. This has the advantage of attracting and retaining talents, effective cash flow management as cash out is minimized, facilitates employees' engagement, and helps align firm's mission with employees' values (Atunal & Aybars, 2018). Equity compensation assumes different forms such as: (i) stock options (which could either be incentive stock options or non-qualified stock

options), (ii) restricted stock, (iii) cash deferred bonus plans (stock appreciation rights where compensation is tied to the performance of firm's stock), (iv) performance shares, and (v) employee stock purchase plans (which allows employees to purchase their company's stock at a discount off the fair market value (Kenton, 2022)).

Specifically, the components of CEO compensation are; fixed pay, bonus, and stock option (Chan & Ma, 2017). Fixed pay is the basic time-based cash compensation received by CEOs, not related to performance within that period. CEOs that are under this arrangement are typically risk averse. Bonus pay is an arrangement where an amount above the fixed pay is offered based on CEO's performance. Boards do use corporate performance as an index for setting the bonus to be paid (Mahoney & Thorne, 2005; Chan & Ma, 2017). In stock option form of compensation, CEOs are allowed to buy certain number of the company's share at certain price during a specified period. Consequently, CEOs can make profit on disposal of such shares if price rises.

Notwithstanding the fact that both bonuses pay, and stock option are variable pay predicated on performance, they however differ significantly in time horizon as the inclinations of CEOs are time varying. Bonus pay is intricately tied to short-term firm's outcomes and typically used to compensate CEOs annual performance. In this context, CEOs could be inclined to pursue projects with shorter payback periods so as to maximize their personal gains as quickly as possible and to avoid being labeled as incompetent in handling short-term corporate performance (Mahoney & Thorne, 2006).

Stock option is an equity-based variable pay predicated on long term performance that can align the interests of shareholders with those of CEOs. When CEOs are assessed based on long term performance, it raises their willingness to engage in risky projects as there is no worry about job security arising from poor performance in the short-term. Chan and Ma (2017) have argued that long term strategies can have positive impact on short-term performance. In which case, bonus pay becomes a motivator for CEO to execute long term strategies.

The literature is not silent on the potential problems associated with equity compensation. These problems bother on complexity. For instance, mention has been made of the following: (i) that it carries with it a lot of reporting and regulations. (ii) It dilutes ownership of existing shareholders via diluted earnings per share. (iii) Tremendous effort is required in designing the plan such as the determination of participant eligibility, plan period, vesting schedule, and amount of equity to give away. (iv) It requires equity plan administrator which is an additional workload to existing department. There is need for tracking, reporting changes in ownership, updating policies, communicating with stakeholders, and consulting with the board (CFI, 2022). These characterizations are motivations for addressing the empirical link between equity compensation and firm's performance.

According to Rijamampianina (2019) agency problem arises when the interest and risk propensities of the agent and principal are asymmetric. The cost associated with this problem is called agency cost and it takes the form of monitoring and contracting costs, reduction in productivity, and drop in the value of the firm. It has been suggested that optimal contract should minimize agency cost. The contracting process has three elements to contain. First, to attract and retain high quality executives because of the skills and talents they possess. Secondly, to provide executives with incentives that warrant exertion of efforts sufficient to serve shareholders' interests in the decisions they made. Finally, to minimize total cost, that is, a scheme offering the best incentives at the lowest cost.

Wijst (2018) opined that the implicit assumption of the theory of contracting is that corporate boards plan the contract in a manner that provides incentives for the maximization of shareholders' wealth. Accordingly, executives do not naturally pursue shareholders' value maximization. For managers to receive compensation, they are to behave in accordance with the contract. Obviously, a positive association is expected between firm performance and compensation. Within the framework of optimal contracting theory, Conyon and Freeman (2004) ascertained whether greater performance is due to positive effect of CEO compensation. It was reported that firms with higher levels of CEO compensation displayed tendency to outperform others both in financial performance and productivity. Contrary to this submission, a recent study by Cooper, Gulen, and Rau (2016) found a negative influence of CEO compensation on performance. That is, excess compensation decreases firm performance.

Acharya, John, and Sundaram (2000) assume that firms can continuously re-contract because there are no adjustment costs. However, where contracting is not continuous, firms' ownership levels gradually deviate from the optimal level. This means that a subset of firms always has misaligned incentives but recognizes that the costs associated with re-contracting sometimes exceed the benefits (Hassen, 2014)

Given these assumptions, an effective sample for testing for a link between ownership and firm value is a set of firms for which managerial equity ownership levels are too low (high), but then re-contract to increase (decrease) ownership. For this sample of firms, required adjustments in managers' ownership should increase cash flows to shareholders and increase firm value because firms should rationally re-contract only when the benefits associated with better aligned incentives are greater than the costs of re-contracting (Demsetz & Villalonga, 2001)

2.2 EQUITY COMPENSATION AND FIRM'S COMPETITIVENESS/ PERFORMANCE

Mixed results abound in the empirical and theoretical literature on executive compensation and performance or competitiveness. This is expected because of the cultural environment in which the studies were carried out. For instance, China's policy is consistent with managers' performance based on sales maximization or

firm's competitiveness. Increases in profit in the face of declining sales growth is not rewarded neither is there punishment for negative profit with growth in sales. Evidence of positive association between CEO compensation and firm performance has been reported by Ozkan (2011). Muhammad and Khalid (2019) examined ownership concentration as moderator of CEO compensation-firm innovation nexus using Shanghai and Shenzhen Stock Exchanges non-financial companies A-share data. The panel data analysis results revealed that CEO compensation has positive and significant effect on firm innovation. Ownership concentration was also found to reinforce this relationship. Rijamampianina (2019) found link in executive pay-performance utilizing accounting performance and market performance with non-linear modeling. This result supports optimal contracting framework in South Africa. Using data of Asia Pacific firms over the period 2007-2019, Kayani and Gan (2022) found total compensation to have positive influence on firm performance and the result confirms the agency theory that motivating the executives will make them to maximize shareholders' welfare. This submission had been acknowledged by Ataunal and Aybars (2018)

Smirnova and Zavertiaeva (2017) found a bi-directional relationship between firm performance and executive compensation. Implicitly, executive compensation influences performance and performance also influences executive compensation. Newton (2015) reported negative association between executive compensation and performance. In the same vein, Wijst (2018) did not find a significant positive association between CEO equity compensation and performance in a study of EuroNext 100 non-financial firms over the period 2009 to 2016. Studies, such as, Gomez-Mejia, Larrazza-Kintana and Makri (2003) and Parthasarathy, Menon, and Bhattacharjee (2006) reported no association.

2.3 IT AND FIRM COMPETITIVENESS

The deployment of IT has heightened due to the awareness that firm's sustainable growth relates with the level of environmental consciousness it has. This is against the backdrop of some findings in the empirical literature that explicates the nexus between corporate sustainability and IT (Bose & Lou, 2011; Chan & Ma, 2017). The empirical submission is that IT enables greener corporate operations, sustainable environment for effective business operations which consequently improves firm's financial performance (Ajamieh, Benitez, Braojos, & Gelhard, 2016). IT strategy is not a short term strategy. Its execution spreads over a long time horizon. As a result, CEOs assume greater risk and uncertainties in that they are responsible for organizational performance. Accordingly, they demand higher compensation otherwise; they will not be motivated to execute such highly uncertain strategies.

Innovation is a potent tool that firms can engage to achieve competitive advantage in the face of environmental uncertainty and industry competition. Innovation can be used for preemptive purposes or as a response to changes occurring in both the internal and external environment (Wheatley & Doty, 2010).

A firm's innovativeness (or its innovation strategy) is defined by its expenditure on research and development (R&D). The appropriateness of this operationalization has been clearly articulated to include: (i) there is a direct relationship between the execution of innovation strategy and R&D decisions. (ii) Expenditure on R&D is a capital budgeting decision that is under the jurisdiction of CEO and top management and so compensation policies could have effect on spending for R&D. (iii) Implicitly or otherwise, R&D spending decisions incorporate statements concerning risk preferences of CEOs. Prior studies in information system have also indicated that top management guidance is essential for creating an IT culture conducive for successful IT implementation (Tai & Phelps, 2000; Wang, Chen, & Benitez-Amado, 2015) and many CEOs are knowledgeable about and experienced in the corporate use of IT. Against this backdrop, this present study incorporates IT strategy to moderate the influence of equity-based compensation on a firm's competitiveness.

2.4 AGENCY COST AND FIRM'S RISK

The role played by agency cost and other firm's attributes, such as firm's risk in executive compensation and other strategic decisions has been acknowledged empirically (Mehul & Surenderrao, 2016). Agency cost can be measured by the loss in revenue attributable to inefficient asset utilization which can result from poor investment decisions (for example investing in negative net present value projects) or from management shirking (such as exerting too little effort to generate revenue). This measure is calculated as efficiency ratio which is the ratio of annual sales to total assets. The variability in firm's earning has also been noted to affect compensation of CEOs. These two variables are modeled as control variables in this study.

3. RESEARCH METHODS AND PROCEDURES

This study relied solely on secondary data for analysis. As at December 31, 2020, 161 firms were listed on the Nigerian Exchange Group (NGX) and from these, 106 firms representing 65% of population were selected for a study period of 10 years, that is, 2011 to 2020. Annual financial reports of the selected firms have been collected from the official websites of respective firms and the Exchange publications. All selected firms needed to satisfy the following two criteria in order to ensure continuity of their corporate practices: (i) there was no CEO turnover during the period of investigation; and (ii) the CEO has served in the chosen firm for at least two consecutive years (Banker et al., 2013).

The study employed panel data regression method because of the combination of cross-sectional and time series data. It used least square dummy variable analysis which can handle categorical data. IT strategy was used as a moderating variable in this study. Such variables enable researchers to capture complexities in behaviour. Variables in management studies are intricately linked and so the addition of moderating variable(s) will help in the measurement of interaction effects of variables. Control variables are also added to factor in firms'

heterogeneity.

Table 1: *Measurement of Variables*

Variable Type	Notation	Measure/Definition
Dependent variable		
Firm's competitiveness	REVG	Measured by the average growth rate of firm's sales or turnover
Independent Variable		
CEO Equity based compensation	CEOO	Measured by CEO ownership
Moderating Variable		
IT strategy	ITAR	measured by the ratio of research and development cost to total assets
Control Variables		
Firm's Risk	FIRR	Measured as firm's earnings variability
Firm's Agency cost	FIRA	measured as operating expenses scaled by annual sales

Source: Author's Compilation

4. EMPIRICAL ANALYSIS AND DISCUSSION

Panel Least Square estimation technique was used for data analysis. The technique is considered most appropriate for research that aims to build theory and causal-predictive testing (Benitez-Amado, Henseler, & Roldan, 2016). This contrasts with estimation methods based on covariance structure analysis. In order to illuminate the characteristics of the data, some descriptive statistics are presented in Table 2.

Table 2: *Summary Descriptive Statistics*

Variable	Mean	Std Dev	Min	Max
REVG	13.32	66.89	-100.00	1354.25
CEOO	4.17	15.69	0.00	394.92
ITAR	1.47	5.08	0.00	45.34
FIRR	6.91	0.92	4.03	9.59
FIRA	23.61	13.47	1.00	55.00

Source: Author's Computation

Table 2 provides summary statistics for the measures of firm competitiveness, and the independent, moderating, and control variables used in this study. REVG has a mean value of 13.32 and a standard deviation of 66.89. It has a minimum value of -100.00 and a maximum value of 1354.25. This suggests that on the average, firm average growth rate in the last 10 years across all selected firms revolves around 13%. The annualized amount of CEO compensation ranges from 0.00 to 394.92%. ITAR has a mean value of 1.47 and a standard deviation of 5.08. FIRR and FIRA have respectively mean value of 6.91 and 23.61 and respective standard deviation of 0.92

CORRELATION ANALYSIS

Table 3: *Correlation Matrix*

Variable	REVG	CEO	ITAR	FIRR	FIRA
REVG	1				
CEO	-0.005	1			
ITAR	0.002	0.061	1		
FIRR	0.052	-0.227	0.155	1	
FIRA	-0.062	-0.187	-0.104	0.088	1

Source: Author's Computation

The correlation matrix of the variables is presented in Table 3. It can be seen that CEO and FIRA exhibit weak negative correlation of -0.005 and -0.062 with REV. On the other hand, ITAR and FIRR also exhibit weak positive correlation with REV with correlation values of 0.002 and 0.052, respectively. Also, a negative and weak correlation exists between FIRR, FIRA and CEO with correlation values of -0.227 and -0.187 respectively. FIRR exhibits a positive correlation with ITAR (0.155) while FIRA exhibits a negative correlation with ITAR (-0.104). Therefore, on the whole, the relationships between the variables depict the absence of multicollinearity as there is no correlation coefficient that exceeds 0.90 thresholds (Jason, 2017).

HYPOTHESES TESTING

Table 4 presents the results of the test of hypothesis. The ordinary least square result is presented alongside the panel fixed effect and random effect models.

Table 4: *Results of Panel Least Square Estimation*

Variable	Ordinary Least Square		Fixed Effect (Fixed or LSDV estimates)		Random Effect (EGLS cross-section random effects)	
	Coefficient	t-stat.	Coefficient	t-stat.	Coefficient	z-stat.
CEO	-0.041	-0.267	0.084	0.337	-0.032	-0.204
ITAR	-0.256	-0.555	0.330	0.308	-0.235	-0.478
ITAR*CEO	0.008	0.334	-0.037	-0.527	0.007	0.268
FIRR	4.396	1.887***	-4.484	-0.475	4.318	1.724***
FIRA	-0.349	-	-1.370	-	-0.354	-
		2.233***		1.920***		2.108***
Const	-8.390	-0.509	76.280	1.090	-7.777	-0.438
R-squared	0.007		0.12		0.006	
Adj R-squared	0.003		0.020		0.002	

Durbin Watson stat	1.511	1.703	1.538
Hausman Test (prob.)	3.555 (0.615)		

Source: Author's Computation

**** significant at 10%*

As the objective of this research is to identify the existence of any influence of CEO equity-based compensation and firm competitiveness, the independent, and control variables are regressed against firm competitiveness (REVG). Table 4 shows three different estimation results (the ordinary least square results, the fixed effect, and the random effect results). From the least square estimation results, CEO compensation exhibits negative relationship to firm's competitiveness with value of (-0.041). IT strategy also has negative association with REVG (-0.256). The moderating role of firm's IT captured by ITAR*CEO (0.008) exhibits a positive relationship with firms' competitiveness. Also, firm's risk measured as earnings variability (FIRR, 4.396) exhibits a positive and weak significant effect at 10% level of significance on firm's competitiveness, while agency cost (FIRA, -0.349) exhibits a negative, but weak significant relationship at 10% level to firm's competitiveness.

From the fixed effect results, the coefficients of CEO and ITAR (respectively, 0.084 and 0.330) exhibit a positive relationship with firm's competitiveness, while firm's risk (FIRR, -4.484) and agency cost (FIRA, -1.370) exhibit a negative relationship with REVG. The moderation impact of firm's IT (ITAR*CEO) is negative with the value of -0.037.

Estimates from the random effect model reveal that CEO and ITAR exhibit negative relationship with firm's competitiveness with values of -0.032 and -0.235 respectively. However, this negative influence is not statistically significant as the z-statistics of 0.204 and 0.478 respectively are greater than 0.05. Also, FIRA has a negative value of -0.354 while FIRR exhibits a positive relationship with REVG. The moderation effect here, ITAR*CEO, is positive with a value of 0.007.

However, in choosing the appropriate panel model to use for testing the hypothesis, the Hausman test is conducted. The selection criterion for the appropriate model is: if the probability value of the Hausman coefficient is less than the 0.05 significance level ($p < 0.05$), we reject the null hypothesis, implying that the fixed effect model is appropriate, otherwise accept the null hypothesis, implying that the random effect is appropriate. From Table 3, the value of the Hausman test is 3.555 with a probability value of 0.615. This probability value is greater than 0.05, implying that the null hypothesis of the test is accepted, and random effect is appropriate for the analysis. From the random model, the interaction effect of IT strategy on the association between CEO equity and competitiveness is positive, but as it is not statistically significant at the 5% level, the hypothesis of the study cannot be rejected. While CEO equity compensation has the tendency to enhance firm

competitiveness, the weight of the influence is statistically not significant. Accordingly, the result reflects the level of awareness by Nigerian firms on greener corporate operations. This result is consistent with Ozkan (2011), Chan and Ma (2017), and Wijst (2018).

5. CONCLUSION

This study has empirically examined the effect of the moderating role of firm's IT strategy on the link between firm's competitiveness and CEO equity based compensation. Overall, the empirical findings from the random effect model revealed that, the moderating role of firms' IT exhibits a positive relationship to firms' competitiveness, however, not significant. The moderation analysis of competitive intensity further highlights that this contextual factor exerts various effects on the aforementioned relationships. In all, the findings highlight the need for CEOs to engage in IT-related pursuit, especially under a highly competitive operating environment. It is also suggested that firms align their CEO remuneration packages with IT-based strategic endeavors.

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