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## Moderating Effect of Information Technology Maturity on the Relationship between Board Attributes and Performance of State Enterprises in Kenya

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### **Abstract:**

*The study sought to establish the moderating effect of information technology maturity on the relationship between board attributes and performance of state enterprises in Kenya. The research used descriptive research design. The study population consisted of 130 state owned corporations by Taskforce on Corporation Reforms. A sample of 97 state owned corporations was selected using stratified random sampling. A questionnaire composed of open and closed ended questions was used to collect primary data. Quantitative data was analyzed using Statistical Package for Social Sciences (Version 24). In addition, a multivariate regression model was generated to assist in determination of the relative moderating effect of information technology maturity on the relationship between board attributes and performance. The regression results showed that when information technology maturity was the moderating variable between board attributes and performance, board structure had the highest coefficient of 0.706, followed by board role with a coefficient of 0.623, followed by operating environment with a coefficient of 0.517, and lastly board demographics with a coefficient 0.437. The study concludes that information technology maturity insignificantly moderates the relationship between board structure and performance in the state owned corporations. Also the study concludes that information technology maturity significantly moderates the relationship between board operating environment and performance in the state owned corporations. The study concludes that information technology maturity insignificantly moderates the relationship between board demographics and performance in the state owned corporations. Lastly, the study concludes that information technology maturity significantly moderates the relationship between board role and performance in the state owned corporations. The study recommends that board of directors in state owned corporations should consider information technology maturity as it moderates the relationship between board attribute and performance of state owned corporations.*

**Keywords:** Information technology maturity, board attributes performance

### **1. Introduction**

Numerous studies have investigated the essential features of corporate governance; most of the discussion on corporate governance has been driven by concerns regarding the effectiveness of board of directors that is assumed to represent the interests of the owners through controlling the opportunistic behavior of organization managers and also through provision of resources to the firm. Technological changes in the business environment have alerted organizations on the need to develop technological policies that are consistent with their business strategies as they improve adoption of technology in the delivery of their products and services. No wonder, embark on effective deployment of information technology has been recognized as one of the single most critical success factors in creating and sustaining competitive advantage for organizations (Duztas, 2008; Porter, 1997).

Wibowo (2011) argues that it is the responsibility of the organization's top executive to ensure that organization's information technology supports the goals and objectives of the organization using variety of structural mechanisms for communication relationship. He suggests that the effective governance of Information Technology may have influence on the bottom line performance of SOEs and that corporate governance regulations is one of the key enablers in this relationship. The role of information technology in improving governance and transparency structure of organizations has been acknowledged anecdotally. Management information systems reporting, organizations websites, Internet, email and business intelligence systems improve information quality and veracity and thus have the potential to facilitate achievement of key achievements of public enterprises (Duztas, 2008; Wibowo, 2011).

In terms of corporate governance, the utilization of information technology may enhance the connectivity among board members and management and thus facilitate strategic decision making and overall board effectiveness. Considering that Information technology Maturity is ranked high by top management teams as a critical success factor for business today and recognizing that Information Technology is not necessarily related to organization performance, it is important to explore the moderating effects of information technology management maturity in the corporate governance performance relationship. IT Maturity is perceived as the evolution in planning, organization, control and integration aspects of the Information System function with higher integration implying a more proactive orientation towards Information Technology (Duztas, 2008).

State owned enterprises contribute significantly to the Kenyan economy in terms of not only offering products and service to the citizens of Kenya but also by offering employment (Koigi, 2011). These enterprises account for about 20% of the wage employment in the public sector (Kenya National Bureau of Statistics, 2006) and approximately 11% of the Kenya's GDP (Centre for Governance and Development, 2005). Despite these critical investments, the state of governance of state owned enterprises and their performance has been decried as suboptimal (Mwaura, 2007; World Bank, 2007) and persistent calls have been made to reform the corporate governance regime of Kenyan state owned corporations (Kisero, 2012).

### *1.1. Statement of the Problem*

Board attributes such as board structure and board demographics have been considered to have a significant influence on performance of organizations (Koech, 2018). This is despite the fact that prior studies on corporate governance and particularly on board of directors attributes and the relationship with organizational performance have not been consistent whether empirically, methodologically, or even theoretically (Daily, Dalton & Cannella, 2003; Van Ness, Miesing & Kang, 2009).

Most studies on moderating effect of information technology maturity on the relationship between board attributes and performance were conducted in private organization and little studies are done in public institutions. Also majority of the studies on moderating effect of information technology maturity on the relationship between board attributes and performance of state corporations are focused on developed countries such as USA, Britain and China with little studies conducted in developing countries. The study sought to analyze the moderating effect of information technology maturity on the relationship between board attributes and performance of state corporations in Kenya. Further, the role of information technology in enhancing the engagement of the boards as agents and the public as principals has not been adequately appraised (Mwaura, 2007). These contradictions call for further re examination of the influence of board attributes on performance of state owned enterprises in Kenya.

### *1.2. Research Question*

- To find out the moderating effect of information technology maturity on the relationship between board structure and performance of State Owned Enterprises (SOEs) in Kenya
- To establish the moderating effect of information technology maturity on the relationship between board operating environment and performance of State Owned Enterprises in Kenya
- To determine the moderating effect of information technology maturity on the relationship between board demographics and performance of state owned enterprises in Kenya
- To find out the moderating effect of information technology maturity on the relationship between board role and performance of state owned enterprises in Kenya

## **2. Literature Review**

Technological changes in the business environment have alerted organizations on the need to develop technological policies that are consistent with their business strategies as they embark on improving adoption of technology in the delivery of their products and services. No wonder, effective deployment of information technology has been recognized as one of the single most critical success factors in creating and sustaining competitive advantage for organizations (Duztas, 2008, Porter, 1997).

Wibowo (2011) argues that it is the responsibility of the organization's top executive to ensure that organization's information technology supports the goals and objectives of the organization using variety of structural mechanisms for communication relationship. He suggests that the effective governance of Information Technology may have influence on the bottom line performance of SOEs and that corporate governance regulations is one of the key enablers in this relationship. The role of information technology in improving governance and transparency structure of organizations has been acknowledged anecdotally. Management information systems reporting, organizations websites, Internet, email and business intelligence systems improve information quality and veracity and thus have the potential to facilitate achievement of key achievements of public enterprises (Duztas, 2008; Wibowo, 2011). In terms of corporate governance, the utilization of information technology may enhance the connectivity among board members and management and thus facilitate strategic decision making and overall board effectiveness.

Considering that Information technology Maturity is ranked high by top management teams as a critical success factor for business today and recognizing that Information Technology is not necessarily related to organization performance, it is important to explore the moderating effects of information technology management maturity in the corporate governance performance relationship. IT Maturity is perceived as the evolution in planning, organization,

control and integration aspects of the Information System function with higher integration implying a more proactive orientation towards Information Technology (Duztas, 2008).

### 3. Methodology

The researchers used descriptive research design. There are 7 state owned corporations that are universities, 11 state owned corporations in training and research corporations, 37 state owned corporations in service industry, 6 state owned corporations in tertiary education and training corporations, 29 state owned corporations in regulatory, 33 state owned corporations in commercial and 22 state owned corporations in financial (Taskforce on Corporations Reforms 2013). The study focused on 145 state owned enterprise in Kenya. The sample size was determined using Krejcie (1970) sampling frame which recommends the appropriate sample for any given population. Given the population above and in accordance with Krejcie and Morgan (1970), formula the sample size of the study was 75. The study applied stratified sampling technique to determine the number of re. The study applied stratified sampling to establish the number of respondents in each class. Krejcie (1970) formulae used was as follows:

$$S = \frac{X^2NP(1 - P)}{d^2(N - 1) + X^2P(1 - P)}$$

Where S = required sample size

$X^2$  = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).

N = the population Size

E= precision level at 0.05

N= sample proportion of success

P= the population proportion (assumed to be .50 since this would provide the maximum sample size).

d= the degree of accuracy expressed as a proportion (.05).

Category	Sampling Frame	Sample
Public Universities	7	4
Training and Research Corporations	11	6
Service Corporations	37	19
Tertiary Education and Training Corporations	6	3
Regulatory	29	15
Commercial /Manufacturing	33	17
Financial	22	11
	145	75

Table 1: Sample Size

#### 3.1. Data Collection Instruments and Procedure

The questionnaire consisted of both open and closed ended questions to allow respondents to express their opinions. The researcher prepared a questionnaire with brief instructions which allowed the respondents to tick their opinion and express their views with regards to the questions. The research instrument had a likert scale in the constructs. The method used to collect data by the research was drop and pick later method and consistent calling to the respondents.

### 4. Findings and Discussions

The target was 75 State corporation in Kenya; however, the completed and usable questionnaires were 61 making a response rate of 81.3% percent which was considered good for data analysis based on Sapsford & Japp, (2006) a response rate of 60% and above is good and reliable for data analysis.

#### 4.1. Descriptive Analysis

The study sought to establish the moderating effect of information technology on performance among state corporations in Kenya. To begin with, information regarding organizations information technology was pursued where 27.5% demonstrated strong agreement with IT projects supports the financial and operational objectives and strategies of the organization, 57.6% agreed to this, 7.6% were neutral and 7.2% disagreed with IT projects support the financial and operational objectives and strategies of the organization.

The results indicate that most IT projects supported the financial and operational objectives of state owned corporations. On continuously examination of innovation opportunities IT can provide for competitive advantage, 5.1% strongly agreed, 78.6% agreed, 9.4% were neutral and 6.9% disagreed. This implied that the state owned corporations evaluate the innovation opportunities IT can provide.

The study sought to investigate whether the respondents are adequately informed on the current use of IT by competitive forces (including customers, suppliers and competitors) in the industry. 26.8% strongly agreed, 40.6% agreed, 18.1% were neutral and 14.5% disagreed. This implied that most state owned corporations ensured that the employees were informed on the current use of IT by competitive forces. The study further sought the opinion on the respondents are adequately informed on the potential use of IT by competitive forces (including consumers, suppliers, and competitors) in our industry. 26.8% strongly agreed, 39.1% agreed, 15.9 were neutral 13% disagreed and 5.1% strongly disagreed. This implied that state owned corporations adequately informed the employees on the potential use of IT.

The respondents were asked on whether the organizations had adequate picture of the coverage and quality of our IT systems. 18.8% strongly agreed, 64.5% agreed, 9.1% took a neutral stand and 7.6% disagreed. On the opinion on whether the respondents are content with how our IT project priorities are set. 37.3% strongly agreed, 37.7% agreed, 15.9% were neutral, 5.4% disagreed and 3.6% strongly disagreed. The results showed that most employees of state owned corporations were contented with the IT projects.

The respondents were asked on their opinion on whether the responsibility and authority for IT direction and development are clear. 27.2% strongly agreed, 40.9% agreed, 24.6% were neutral and 7.2% disagreed. This implied that the most IT direction and development for most state owned corporations were clear. The study also sought opinion on the respondent confident that IT project proposals are properly appraised. 6.9% strongly agreed, 65.9% agreed, 16.3% were neutral and 10.9% disagreed. This implied that most state owned corporations appraised the IT projects.

The respondents were asked to indicate their opinion on whether they constantly monitor the performance of IT functions. 25% of the respondents strongly agreed, 35.5% disagreed, 25% of the respondents were neutral, 5.8% disagreed and 8.7 of the respondents strongly disagreed. This implied that employees in some of the state owned corporations monitored the performance of IT functions. The respondents were asked their opinion on whether the IT functions is clear about its goals and responsibilities. 7.6% strongly agreed, 62.0% agreed and 30.4% were neutral. This implied that the IT functions of most state owned corporations was clear about its goals and responsibilities.

On the opinion whether IT functions is clear about its performance criteria. 35.1% strongly agreed, 45.3 agreed, 4.7% were neutral and 14.9% disagreed. This results indicate that most state owned corporations had IT functions clear about the performance criteria. The study sought opinion on whether the IT specialist-user relations in our firm are constructive. 12% strongly agreed, 55.4% agreed, 19.6% were neutral and 13% disagreed. This implied that the most IT specialist of the state owned corporations were constructive.

#### 4.2. Inferential Analysis

The results of the study indicated that R for the moderation of information technology maturity on the relationship between board attributes and performance is .653 with an addition of the interaction terms ( $X_1*Z$ ), ( $X_2*Z$ ), ( $X_3*Z$ ) and ( $X_4*Z$ ), the R<sup>2</sup> is 0.427, implying that 42.7% of the performance can be attributed to the moderation of information technology maturity on board attributes

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.653 <sup>a</sup>	.427	.339	.92130

Table 2: Model Summary for the Moderation of Information Technology on the Relationship between Board Attributes and Performance  
a. Predictors: (Constant),  $X_4Z$ , Board Structure, Board Operating Environment, Board Role, Board Demographics,  $X_2Z$ ,  $X_1$ ,  $X_3Z$

The model for the moderating effect of information technology on the relationship between board attributes and information technology maturity was found to be significant (p value<0.001). The introduction of the interaction term ( $X_1Z$ ,  $X_2Z$ ,  $X_3Z$ ,  $X_4Z$ ) was significant, revealing (F =4.851, p-value=0.001).

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	121.112	8	15.139	4.851	.001 <sup>b</sup>
	Residual	162.287	52	3.120		
	Total	283.399	60			

Table 3: Anova for the Moderation of Information Technology on Performance

The results show the moderating effect of information technology maturity on the relationship between board attributes and performance. The coefficient  $\beta$  value for board structure is 0.706 is very significant at p value of (0.000) which is less than the level of significance of 0.05.

Additionally the t computed 4.9337 is greater than the T critical of (1.96) implying that the predictor variable board structure is significant and has an influence on the performance of state owned corporations. The coefficient  $\beta$  value for board operating environment (0.517) is significant at p value (0.000) which is less than the level of significance (0.05) implying that the predictor variable board operating environment is significant. Additionally the t computed (3.692) is greater than t critical 1.96 implying that board operating environment has an influence on the performance of state owned enterprises.

The coefficient  $\beta$  value for board demographics of 0.437 is not significant at p value (0.104) which is greater than the level of significance (0.05) implying that the predictor variable is not significant. The t computed 1.741 is less than t critical 1.96 implying that the predictor variable board demographics is not significant and therefore its influence on the performance of state owned corporations is not statistically significant.

Board role has a coefficient  $\beta$  value of 0.623 which is statistically significant at p value (0.001). The p value is lower than the level of significance (0.05) implying that the predictor variable board role is significant. Additionally the t computed 3.296 is greater than t critical 1.96 indicating that board role is significant and has an significant influence on the performance of state owned enterprises.

The results showed that the combination of the interaction term ( $X_1*Z$ ) was positive and had insignificant effects ( $\beta= .512$ ,  $t= 1.885$ ,  $p \text{ value}=0.083$ ). This implied that information technology maturity insignificantly moderates the relationship between board structure and performance in the state owned corporations.

The findings also indicated that the overall combination of the interaction term ( $X_2*Z$ ) was positive and was significant ( $\beta= .530$ ,  $t= 3.841$ ,  $p \text{ value}=0.000$ ). This implied that information technology maturity moderates the relationship between board operating environment and performance in the state owned corporations.

The results shows that the overall combination of the interaction term ( $X_3*Z$ ) was positive and was not significant ( $\beta= .506$ ,  $t= 1.867$ ,  $p \text{ value}=0.072$ ). This implied that information technology maturity does not moderate the relationship between board demographics and performance in the state owned corporations. The results shows that the overall combination of the interaction term ( $X_4*Z$ ) was positive and was significant ( $\beta= .697$ ,  $t= 4.801$ ,  $p \text{ value}=0.000$ ). This implied that information technology maturity moderate the relationship between board role and performance in the state owned corporations.

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	19.359	2.357		8.213	.000
board structure	.706	.143	.618	4.937	.000
board operating environment	.517	.140	.380	3.692	.000
Board demographics	.437	.251	.313	1.741	.104
Board role	.623	.189	.441	3.296	.000
$X_1Z$	.512	.276	.292	1.855	.083
$X_2Z$	.530	.138	.618	3.841	.000
$X_3Z$	.506	.271	.256	1.867	.072
$X_4Z$	.697	.145	.441	4.801	.000

Table 4: Coefficient Table for the Moderation of Information Technology Maturity on the Relationship between Board Attributes and Performance

Hence, applying the regression coefficients in the table above, the fitted regression model for this study was:  
 $Y = 19.359 + 0.706X_1 + 0.517X_2 + 0.437X_3 + 0.623X_4 + 0.712X_1Z + 0.530X_2Z + 0.506X_3Z + 0.697X_4Z$

## 5. Conclusion

This study concludes that that information technology maturity insignificantly moderates the relationship between board structure and performance in the state owned corporations. Based on the findings the study concludes that information technology maturity moderates the relationship between board operating environment and performance in the state owned corporations significantly. In addition the study concludes that information technology gives an enterprise a competitive advantage. This study concludes that information technology maturity does not moderate the relationship between board demographics and performance in the state owned corporations. Lastly the study concludes that information technology maturity moderate the relationship between board role and performance in the state owned corporations

## 6. Recommendations

From the findings of moderating effect of information technology maturity on the relationship between board attributes and performance the study makes the following recommendations. First, this research paper recommends that state owned enterprises should ensure that the technology adopted should support the goals set by the board members as this will improve the efficiency of the enterprises. Second, the study recommends that board members of state owned enterprises and other sectors should provide resources and support information technology and continuously examine innovative opportunities. In addition the information technology structure should fit well the enterprises. Third, the study further recommend that the state owned enterprise should have mechanism to introduce and experiment on new technology.

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