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The Joint Effect of Organizational Characteristics, Governance Reforms, and Stakeholder Management on the Performance of Ports in Africa

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ABSTRACT

The key purpose of carrying out this research was to determine the joint effect of organizational characteristics, governance reforms, and stakeholders' management on the operational performance of seaports from Africa. The research philosophy employed by the study was positivism with a descriptive cross-sectional census survey design. Structured questionnaires were deployed to collect primary data from 46 top executives of seaports in Africa that specialize in handling containers. The rate of response was response rate was 83%. Additional published data was also obtained from the websites of some of the ports. Reliability and validity for the indicator items were ascertained through diagnostic tests. Model fitness was ascertained by obtaining ratios of SRMR and NFI. Data analysis was carried out by Partial Least Squares Structural Equation Modelling (PLS-SEM) using Smart PLS4.1 software. PLS-SEM was also used to test the hypothesis that the joint effect of organizational characteristics, governance reforms, and stakeholders' management on the operational performance of seaports from Anglophone Africa was not significantly greater than the individual effect of each variable on the performance. The individual effects of each variable with their moderating effects were the first to be determined through PLS-SEM before finally establishing the joint effect of the three exogenous constructs. The finding established that the joint effect was greater than the individual effect of each variable and concluded that a joint application of the three variables greatly improves the performance of seaports in Africa, thereby enabling them to gain a competitive advantage. The study adds to new knowledge, policy, and practice by enabling managers, policy

makers and governments, and regulators to expand, plan, build, and operate new ports from an informed point of view.

Keywords: Organizational characteristics, governance reforms, stakeholders' management, Partial Least Squares Structural Equation Modelling; Measurement Model Estimation, Structural equation modelling.

INTRODUCTION

Organizational characteristics are present in the organization's internal and natural environment resources. These characteristics include size, age, ownership, and diversification [1, 2]. Studies by [3, 4, 5] further recognized other factors of performance, such as the organization's size, infrastructure, age, strategic location, information and communications technology (ICT), efficiency level, costs, reliability, and the region's economic expansion.

Governance reforms refer to the adoption and application of new guidelines fundamental to conducting and exercising authority over an organization's assets, in managing and accomplishing the organization's objectives, essentially meeting shareholders' wishes to the benefit of humanity and the economy. For seaports, the [6] introduced a reforms toolkit to guide reforms namely, the landlord model, where the public retains ownership and regulation while management remains in private hands; the public service model in which the organization retains ownership of all the assets including land but could also the regulator and operator; the tool model where the organization owns and maintains facilities and equipment but operations is done by private companies and lastly the private service model where the organization is owned and operated by private companies. The distinction and separation depend on who owns the infrastructure and who manages and provides services [7].

A stakeholder is any group or person that can have an impact on the activities or purpose of a company or organization, or can be equally impacted by it [8]. Stakeholders come from varied categories, including shareholders, environmentalists, suppliers, freight companies, transporters, employees, local community, and government agencies, which leads to complex decision-making processes with differing and conflicting interests. When shareholders, market players, and managers who are usually driven by profit differ on their priorities and they compromise social well-being and the environment, these may lead to conflicts [9,10]. Stakeholders' management is the method by which stakeholders' relationships are organized, improved, and monitored. The process encompasses systematically identifying key stakeholders, evaluating their needs and expectations, and scheduling and executing various tasks as a way of engaging with them. A good stakeholder management process enables coordination of engagement with various stakeholders and assessing the quality and status of relationships with them, managing their expectations, and mitigating any possible conflict [11].

Performance refers to how effective and efficient the organization is in the utilization of its resources and the attainment of its targets. Good performance represents institutional effectiveness and competence in utilizing capital and is a contributor to the economy [12]. The performance of an organization involves its real outcome or output when compared with the

anticipated throughput. Organizational performance incorporates precise zones of organizational results, namely, financial, product performance in the market, and operational performance [13]. Performance could be measured by the use of tools like 360-degree feedback, key performance indicators (KPIs), performance appraisals, and balanced scorecards, as performance measurement estimates the parameters under which programs, investments, and acquisitions achieve targets [14].

According to [15], most performance measures can be classified as efficiency, effectiveness, timeliness, quality, and productivity. [16] posit that performance measurement is a requirement to facilitate the growth of all activities of economic value and should be measured through a yardstick for comparative purposes. In the context of ports, [17] recognized the performance measures as berth cargo throughput and operational efficiency, crane moves per hour, truck turnaround time, vessel turnaround time, terminal charges, and vessel and truck turnaround, which are crucial factors of performance for terminal operators. This study adopted all the above seaport performance measures. The study also included the natural environment and stakeholder concern factors that could give rise to sustained operational performance.

African seaports presently handle only one percent of the 72 percent of the world's container trade commanded by developing countries. The main challenges facing them are inefficient operations, lengthy cargo clearing and dwell times, inadequate port and hinterland infrastructure, lengthy documentation processes, and low levels of automation [15]. The African Seaport CEOs Forum held in 2021 recommended measures that, if implemented, would improve the performance and competitiveness of African seaports. These included, among others, improved public investment structure, eradication of operational inefficiencies, and ambitious governance reforms to mobilize and attract public-private partnerships for financing [18]. The report explicitly defined the role of stakeholders in these reforms and set up stable and transparent legal frameworks. This study leveraged the CEO report and other existing literature by establishing the role played by the study variables, organizational characteristics, governance reforms, and stakeholders' management toward enhancing the operational performance of seaports in Anglophone Africa.

ORGANIZATIONAL CHARACTERISTICS, GOVERNANCE REFORMS, STAKEHOLDER MANAGEMENT, AND ORGANIZATIONAL PERFORMANCE

The results of the literature review undertaken from previous studies have depicted the link between organizational characteristics, governance reforms, and organizational performance with inconsistent findings [3, 19, 20]. Other studies have shown the link between organizational characteristics, stakeholders' management, and organizational performance [21,7] with inconclusive and mixed findings. In those previous studies, lack of stakeholder management was found to have led to serious conflicts and poor performance [22,23]. The nature and type of conflicts emanating from governance reforms and the lack of stakeholders' management need to be understood, how academicians have examined them, and how existing literature covers the current debates and practices to guide future research. The reported conflicts were due to the governance reforms that had transformed the dynamics amongst stakeholders by

introducing private sector players to previously strategic public-run organizations [24]. They add that where common interests were lacking, conflicts emerged, and performance suffered. In this regard, stakeholders' management is vital for the success of reforms. Other scholars stated that there should be more future studies on the application and results of models of governance reforms [24, 25]. Other researchers called for a better understanding of stakeholder management about organizational performance improvement by carrying out more studies, as there appeared to be scant [10, 26, 27].

This study sought to find an explanation for the individual and joint effects of organizational characteristics, governance reforms, and stakeholder management on operational performance, specifically for seaports in Africa, to augment new knowledge and to precisely find answers to concerns raised by previous researchers. Even though governance reforms, especially the landlord model, are seen to have taken root in seaports in Africa, the persistent query was whether reforms in governance structures of seaports would influence sound stakeholder management, or whether stakeholder management would influence governance reforms. The answer to this question is expected to be interpreted from the empirical validation to be undertaken in this study. Even though the landlord model of governance reforms is presently seen as being the most dominant, it is, however, the most bureaucratic, as the infrastructure belongs to the state. Another concern is whether other models of governance would be adopted in the future to overtake the landlord model and whether they would result in much improved performance of seaports in Africa [28]. In carrying out the analysis of the joint model, answers to some of the questions raised could be found, especially in explaining whether the three variables acting together would lead to higher organizational performance for African seaports compared to individual variables.

MEASUREMENT MODEL ESTIMATION AND STRUCTURAL EQUATION MODELLING

This investigation aimed to determine the joint effect of organizational characteristics, governance reforms, and stakeholders' management on the operational performance of seaports in Africa. The hypothesis being tested is stated as follows: "The combined effect of organizational characteristics, governance reforms, and stakeholders' management is not significantly greater than the effect of individual exogenous variables on the operational performance of seaports in Africa". Before establishing the joint effect of the three variables on performance, it was first essential to establish the direct effect of organizational characteristics on operational performance, the individual moderating effect of governance reforms, and the individual moderating effect of stakeholders' management on the relationship. To achieve the above, PLS-SEM analysis was undertaken using SmartPLS 4.1.1 software. Measurement model estimation was run on PLS-SEM to establish outer model loadings, internal consistency reliability, and validity, and collinearity ratios for all four reflective latent variables.

Outer Model Loadings

The three latent constructs' indicators were subjected to reliability tests. To obtain maximum reliability, the factor loadings for the indicators must be above 0.4 [29] while the indicator reliability must be above 0.7, but less than [30]. Table 1 displays the results.

Table 1: Reflective Outer Model Results

Latent Variable	Indicator	Loadings	Indicator Reliability	P-Values
Organizational characteristics	Strategic Location	.815	.831	.001
	Size	.801	.834	.001
	ICT	.893	.823	.001
	Infrastructure	.894	.822	.001
	Maritime Services	.871	.825	.001
	Hinterland Connectivity	.729	.836	.001
Governance Reforms	Investment Impact	.978	.845	.001
	Productivity Impact	.977	.846	.001
	Efficiency Impact	.925	.854	.001
Stakeholders' Management	Environmental Issues CSR Conflict Resolution	.932 .687 .910	.841 .843 .847	.001 .001 .001
Operational Performance	Berth Productivity	.893	.830	.001
	Yard Productivity	.692	.854	.001

Table 1 shows that the indicators for the three constructs in the postulated model have reliability and factor loading scores higher than 0.5 [31, 32], confirming model reliability. The bootstrapping procedure conducted confirmed the model's statistical significance as p-values were all less than 0.5.

Internal Consistency Reliability

Composite reliability values were used to assess internal reliability consistency. Scores for composite reliability for the latent variables should be greater than 0.6 to be acceptable [32]. For the reliability to be acceptable, Cronbach's Alpha values should be above [29]. A bootstrapping procedure with 4000 sub-samples was conducted on PLS-SEM to test the model significance. The results are detailed in Table 2.

Table 2: Composite Reliability, Cronbach's Alpha, and AVE of Latent Constructs

Latent Variable	Composite Reliability	Cronbach's Alpha	AVE
Organizational Characteristics	.972	.913	.919
Stakeholders' management	.885	.809	.723
Governance reforms	.933	.958	.699
Organizational performance	.884	.745	.793

Convergent Validity

Information from Table 2 reveals that all the AVE values, which range from 0.608 for the organizational performance variable to 0.723 for stakeholders' management, were all higher than the 0.5 threshold. In addition, a confirmatory factor analysis confirmed convergent validity since all the indicators loaded heavily onto the compatible latent constructs. The results of the confirmatory factor analysis are detailed in Table 3.

Table 3: Confirmatory Factor Analysis

Indicator	Organizational Characteristics	Governance Reforms	Stakeholders' Management	Organizational Performance
Location	**.816**	.217	.325	.612
Size	**.794**	.042	.313	.441
ICT	**.896**	.403	.482	.621
Infrastructure	**.900**	.315	.463	.593
Maritime Services	**.856**	.382	.607	.513
Hinterland connectivity	**.745**	.106	.305	.451
Investment Impact	.355	**.978**	.326	.329
Productivity Impact	.298	**.980**	.280	.290
Efficiency Impact	.176	**.917**	.173	.163
Environmental Issues	.514	.037	**.944**	.413
CSR	.558	.256	**.685**	.205
Conflict Resolution	.288	.355	**.900**	.377
Berth productivity	.658	.124	.420	**.929**
Yard productivity	.483	.254	.288	**.850**

Table 3 displays the results of confirmatory factor analysis that was performed through PLS-SEM analysis to verify convergent validity. The results show that all the indicators of the corresponding constructs load more heavily onto them. The indicators of constructs loading more heavily onto them are a confirmation that convergent validity was achieved.

Discriminant Validity

To confirm discriminant validity, the AVE square root has to be greater compared to the value of the Pearson correlation in the column of the respective construct obtained from the Pearson correlation matrix detailed in Table 28. From Table 2, the square root of AVE for organizational characteristics is 0.959, while the square root of AVE for stakeholders' management is 0.890, and governance reforms is 0.836, and finally the square root of AVE for organizational performance is 0.851. These values are displayed in Table 4 for testing the discriminant validity using the Fornell-Larcker criterion.

Table 4: Fornell-Larcker Criterion Analysis

	OC	GR	SM	OP
Organizational characteristics (OC)	**.959**			
Governance reforms (GR)	.653	**.836**		
Stakeholder management (SM)	.749	.495	**.890**	
Organizational performance (OP)	.460	.509	.343	**.851**

Results from Table 4 indicate that the square root of AVE of organizational characteristics is 0.959, which is greater than the correlation score for the organizational characteristics column (0.653, 0.749, 0.460) obtained from PLS-SEM output. Likewise, the square root of AVE for governance reforms, 0.836, is greater than its correlation score (0.495, 0.509), and the square

root of stakeholders' management, 0.890, is also greater than the correlation scores under it (0.343). The AVE square root for organizational performance (0.851) is greater than the correlation scores for it (0.460, 0.509, and 0.343). The square root scores being higher than the correlation values confirm that discriminant validity is established, as stated by Fornell and Larcker (1981).

To further verify if discriminant validity is established, the Heterotrait-Monotrait criterion test was carried out using PLS-SEM and the scores for the relationships obtained from the output results. Discriminant validity is confirmed if all the ratios are below the maximum threshold of 0.9 [35, 36]. The HTMT ratios read from the analysis output are detailed in Table 5.

Table 5: Heterotrait-Monotrait Ratios

	HTMT Ratios
Organizational characteristics -> Governance reforms	.295
Operational performance -> Governance reforms	.296
Stakeholders management -> Governance reforms	.285
Stakeholders management -> Organizational characteristics	.619
Operational performance ->Organizational characteristics	.765

Table 5 results show the HTMT scores for the constructs for the model with organizational characteristics, governance, and reforms stakeholders' management, which were obtained from PLS SEM analysis. All the values are less than the maximum limit of 0.9, which was recommended by [35,36] as an additional verification of the establishment of discriminant validity in this model.

Predictive Relevance - Q^2 and Overall Model Fit

For any SEM model to be acceptable, endogenous reflective variables must have predictive relevance, Q^2 scores larger than 0 [37]. A Q^2 score of 0.35 demonstrates a large relevance, while 0.15 and 0.02 denote medium and small predictive relevance, respectively. The predictive relevance value for the joint model obtained from the PLS-SEM analysis output was 0.275. This value falls in the range between medium and large predictive relevance. Since the value is greater than zero, the model is acceptable. The model fit was measured using, Standardized Root Mean Square Residual (SRMR) to avoid wrongly specifying a model [38] and by the Normed Fit Index (NFI). SRMR value was suggested to be 0.08 by [39], while [40] recommended a score of 0.1 for a good fit. The NFI measure should be between 0 and 1, where the closer to 1 and the more the parameters in the model, the better the fit [41]. A bootstrapping procedure was also carried out with 5000 sub-samples, and it established that the model was statistically significant. PLS-SEM output results indicated that the SRMSR was 0.111, which was marginally higher than 0.1 specified for the best fit. The value obtained for NFI from PL-SEM S analysis was 0.754 against 0.9 for the best fit. These minor variations were due to the small sample size [42]. The bootstrapping procedure established that the SRMR was statistically significant since the p-value was less than 0.05. The combined SRMR and NFI indices results implied a good fit for the joint model [40, 43].

Variance and Significance of Endogenous Variables

The first structural model estimation was carried out to test the effect of organizational characteristics on organizational performance. The indicators for organizational characteristics were Location (B1), size (B2), ICT (B3), infrastructure (B4), maritime services (B5), and hinterland connectivity (B6). The indicators for operational performance were berth productivity (EOPi; crane moves per hour, vessel turnaround, and crane berth spacing) and yard productivity (EOPii; yard crane moves per hour, tractors per yard crane, and truck turnaround time). The results are detailed in Figure 1.

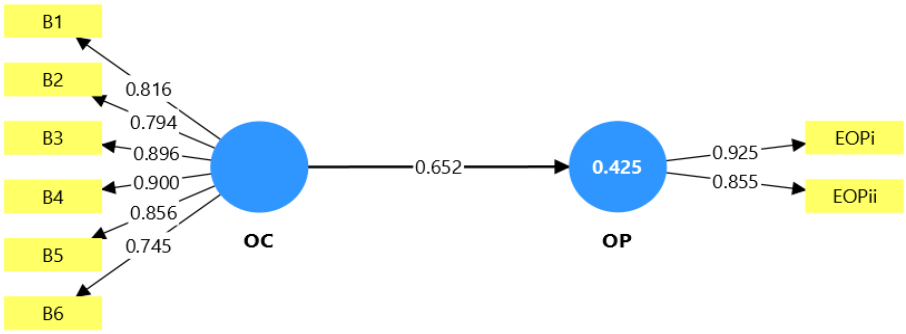

Figure 1: Structural Equation Model for the Direct Effect of Organizational Characteristics on Operational Performance

According to the results in Figure 1, the R^2 value is 0.425, indicating that organizational characteristics account for 42.5% of the variance in organizational performance. The path coefficient between organizational characteristics and operational performance is 0.652 (65.2%). This implies that organizational characteristics are a very strong predictor of operational performance in this model, with only 34.8% predicted by other factors not in this model. The second structural model was carried out to test the moderating effect of governance reforms on the direct effect of organizational characteristics on operational performance. The results are detailed in Figure 1.

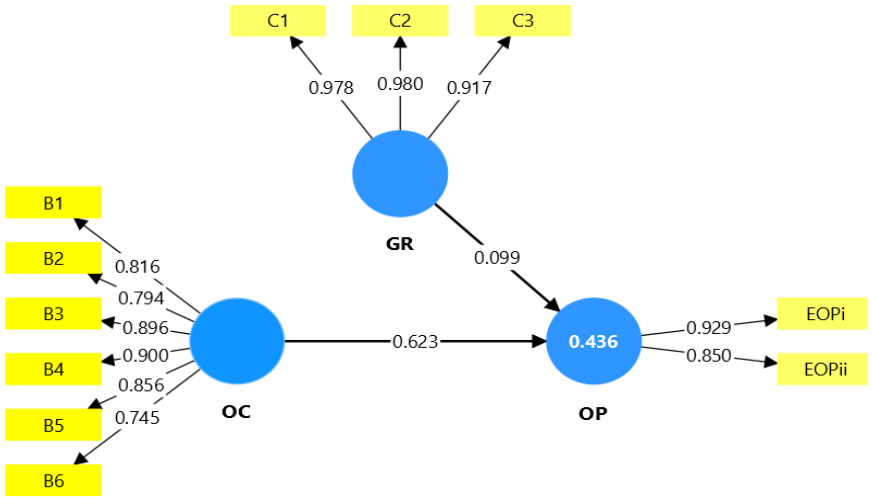

Figure 2: Structural Equation Model depicting the Moderating Effect of Governance Reforms

Figure 2 depicts the simple moderation by governance reforms on the relationship between port characteristics and operational performance. It shows that the explained variance R^2 is 0.436. It implies that both organizational characteristics and governance reforms explain only 43.6% of the variance in operational performance. The path coefficient between port characteristics and operational performance is 0.623, while the path coefficient between governance reforms and operational performance is 0.099. It demonstrates that organizational characteristics is the strongest predictor of operational performance in this model, followed by governance reforms.

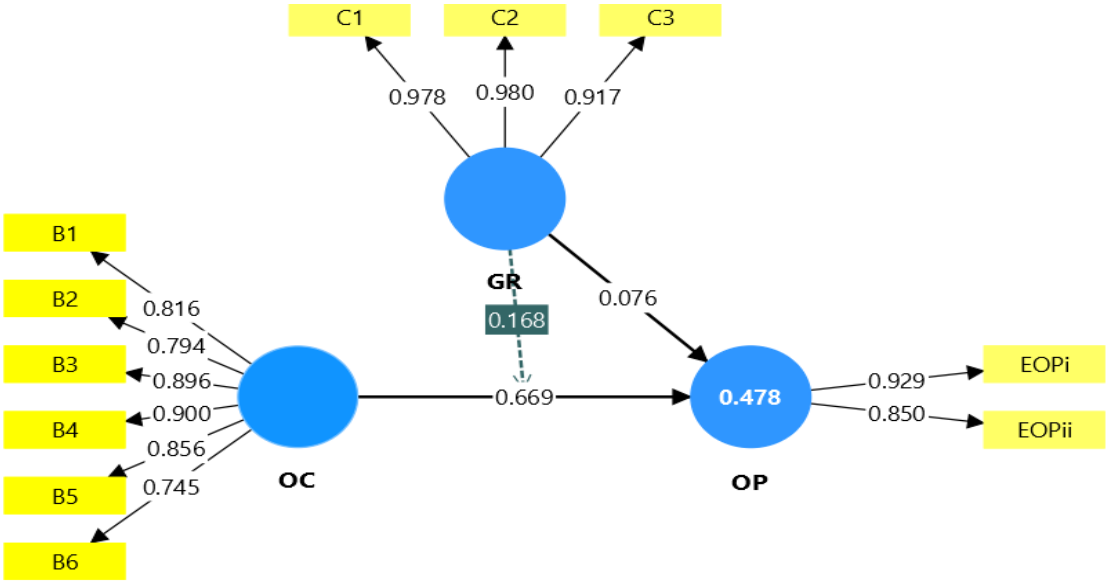

Figure 3: Structural Equation Model Illustrating the Moderating Effect of Governance Reforms

Figure 3 indicates that the interaction of the moderation effect of governance reforms on the path between port characteristics and operational performance increased the path coefficient from 0.623 in Figure 1 to 0.669. The effect shows that the path coefficient of the interaction effect is 0.168, while the path coefficient between governance reforms and operational performance reduced marginally from 0.99 and 0.076. This power of interaction also increased the explained variance R^2 from 0.436 to 0.478. This implies that the strongest predictor of operational performance in this model is port characteristics, followed by the moderation effect in that order. It also implies that the interaction of the moderation of governance reforms improves explained variance from 43.6% to 47.8% which means that it leads to higher operational performance.

The third structural model estimation was carried out to test the moderation effect of stakeholders' management on the relationship between port characteristics and operational performance, as depicted in Figure 4. The idea was to estimate the individual impact of stakeholders' management as a moderator on the dependent variable.

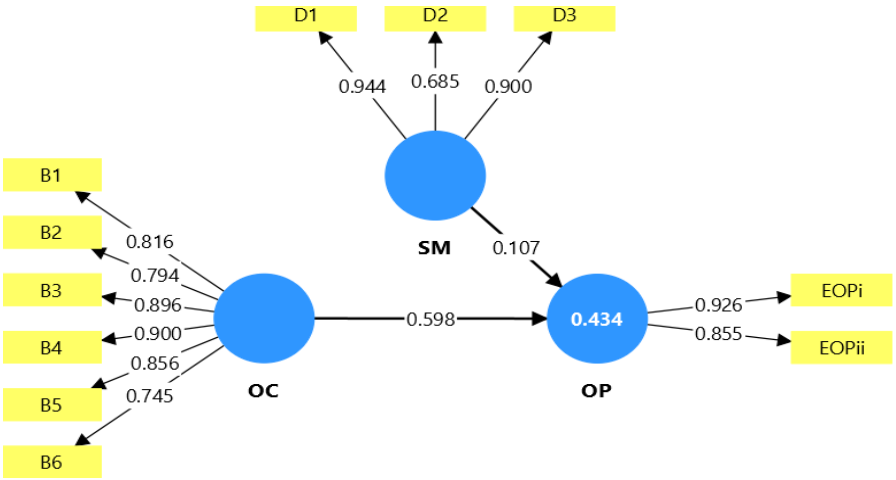

Figure 4: Structural Equation Model Showing the Moderation by Stakeholders' Management

The results from Figure 4 indicate that the introduction of stakeholders' management as a moderating variable increases the R^2 value from 0.425 in the direct effect model to 0.434 in this model. It also means that the application of stakeholder management to the direct effect model increases operational performance. In this model, the strongest predictor of operational performance is port characteristics (0.598), followed by stakeholders' management (0.107). The bootstrapping procedure carried out with 5000 sub-samples confirmed the statistical significance of the model. Figure 5 depicts the interaction effect of the moderation of stakeholders' management on the link between port characteristics and operational performance.

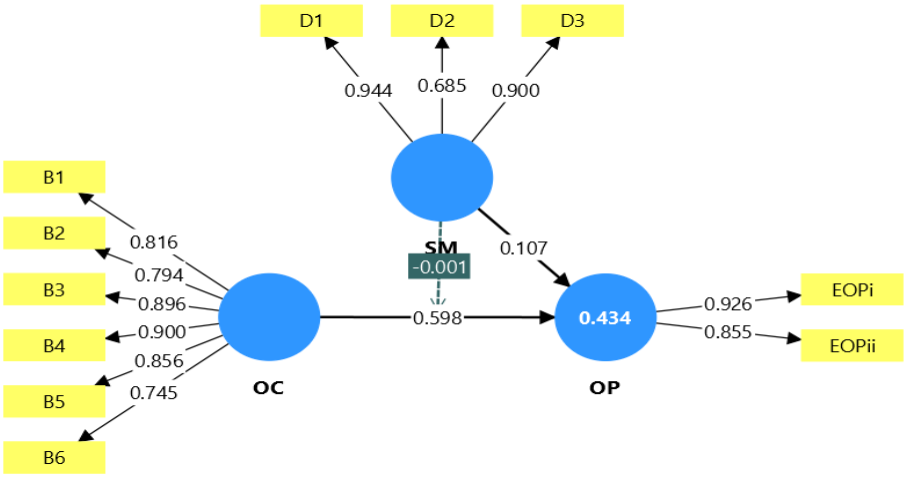

Figure 5: The Interaction of the Moderation Effect of Stakeholder Management

Results from Figure 5 indicate that the standardized path coefficient between stakeholders' management and operational performance (0.107) is statistically significant; however, the standardized path coefficient of the interaction effect (-0/001) on the relationship between organization characteristics and operational performance is not statistically significant. This is because its value of -0.001 is lower than 0.1. Thus, it is concluded that the interaction effect of

moderation does not predict the relationship between organizational characteristics and operational performance directly, and the effect is negligible. This is confirmed by the fact that the standardized path coefficient between governance reforms and operational performance and the standardized path coefficient between organizational characteristics and operational performance have remained constant despite the application of the interaction effect. This means that the interaction moderation of stakeholders' management on the relationship is indirect.

The last structural model to be tested was the joint effect model. The intention was to establish if the joint effect of all three exogenous latent variables on operational performance would be greater than the individual effect of each variable. The null hypothesis stated that the joint effect of organizational characteristics, governance reforms, and stakeholder management is not significantly greater than the effect of each variable on the operational performance of ports in Anglophone Africa.

PLS-SEM analysis was conducted on the model involving all four variables. Figure 6 shows the direct effect of organizational characteristics on operational performance, the simple moderation by both governance reforms and stakeholder management on that relationship (between organizational characteristics and operational performance). Figure 6 shows the structural model for the joint effect, and Figure 7 shows that effect of the interaction of the moderation effect of the moderation by governance reforms and by stakeholders' management.

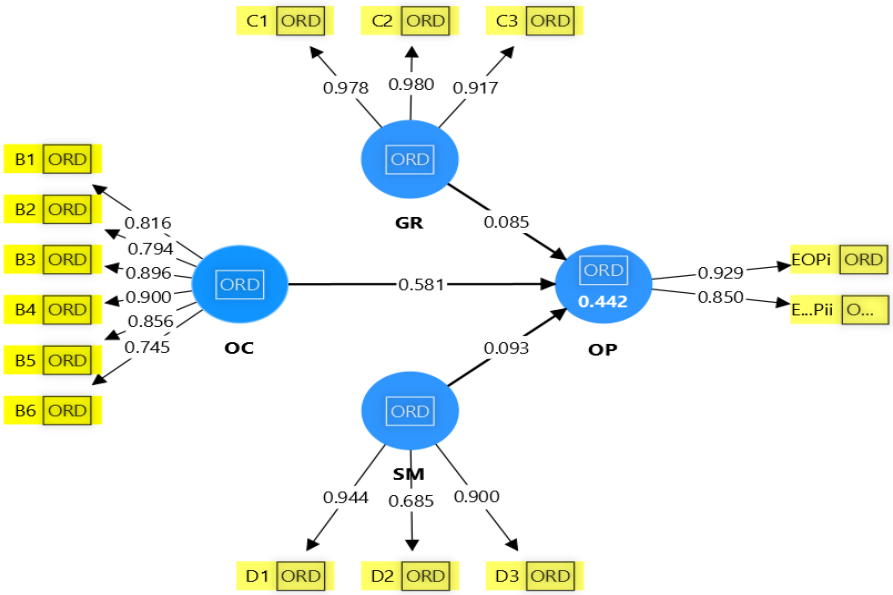

Figure 6: Modelling Path Diagram with Loadings, Coefficients, and R^2

Figure 6 statistics show that R^2 for organizational performance is 0.442. This implies that organizational characteristics, stakeholders' management, and governance reforms jointly explain 44.2% of the variance in operational performance. This means that 55.8% of the variance is explained by other factors not in the model. The standardized path coefficient

between organizational characteristics and operational performance is 0.581, while that between governance reforms and organizational characteristics is 0.085, and the one between stakeholders' management and operational performance is 0.093. This implies that only 58.1% of organizational characteristics, 8.51% of governance reforms, and 9.3% of stakeholders' management are responsible for predicting 44.2% of the change in operational performance.

Joint Moderating Effects Analysis

Figure 13 shows the model with the joint effect of organizational characteristics, the moderating effect of governance reforms, and the moderating effect of stakeholders' management on organizational performance. The interaction of the moderating effect of governance reforms is indicated by the dotted line from governance reforms to the path coefficient line between organizational characteristics and operational performance. This is indicated as 0.223 in the structural diagram. The interaction effect of the moderation of stakeholders' management is marked by the dotted line from stakeholders' management to the path coefficient line between the modelling path diagram with the moderation effect.

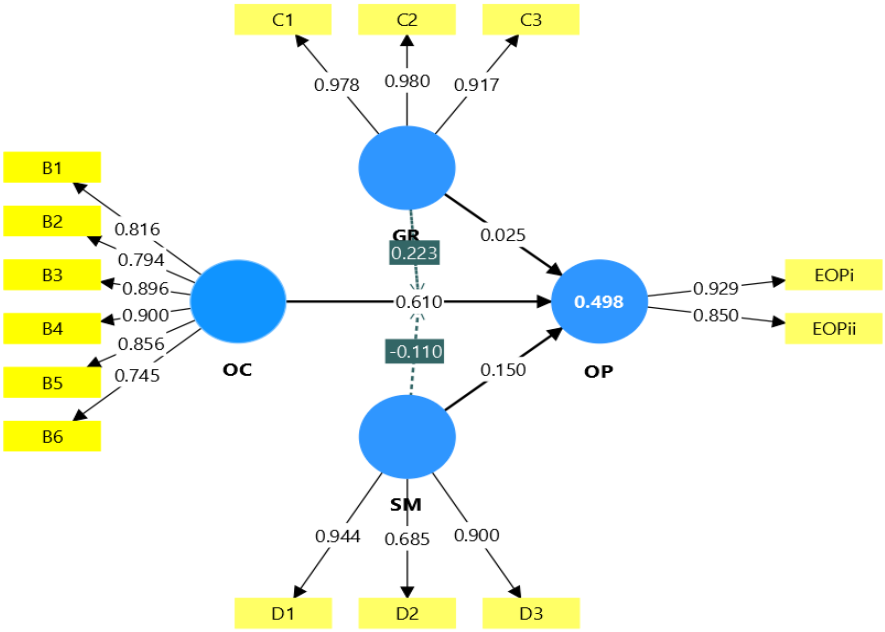

Figure 7: Model Path Showing Moderating Effects with Path Coefficients

Information from Figure 7 shows that the effect of the moderation of stakeholders' management is -0.110, while the simple impact of organizational characteristics on operational performance is 0.610. This means that the link between organizational characteristics and organizational performance is 0.610 for a regular level of stakeholders' management. This implies that if stakeholders' management is improved by a standard deviation, the connection between organizational characteristics and operational performance is reduced by the impact of interaction [thus 0.610 + (-0.110) = 0.500]. However, when stakeholders' management reduces by one standard deviation, the link between organizational characteristics and operational performance increases by the interaction impact [i.e., 0.610 – (-0.110) = 0.720].

Likewise, the moderation effect of governance reforms in the model is 0.223, while the simple impact of organizational characteristics on operational performance is 0.610. This implies that the link between organizational characteristics and organizational performance is 0.610 for a regular level of governance reforms. This implies that when governance reforms increase by one standard deviation, the link between organizational characteristics and operational performance will be reduced by the effect of interaction, thus, [0.610 + 0.223 = 0.833]. Meanwhile, if governance reforms are reduced by one standard deviation, the link will reduce by the effect of interaction (0.610- 0.223) = 0.387.

Simple Slope Analysis for Joint Effect

The slope analysis is done to appreciate and deduce the effect of moderating predictor variables on the relationship between the independent and the dependent variables. Figure 10 displays the simple slope analysis obtained from the PLS-SEM analysis for the joint effect model to determine the strength and direction of the moderation.

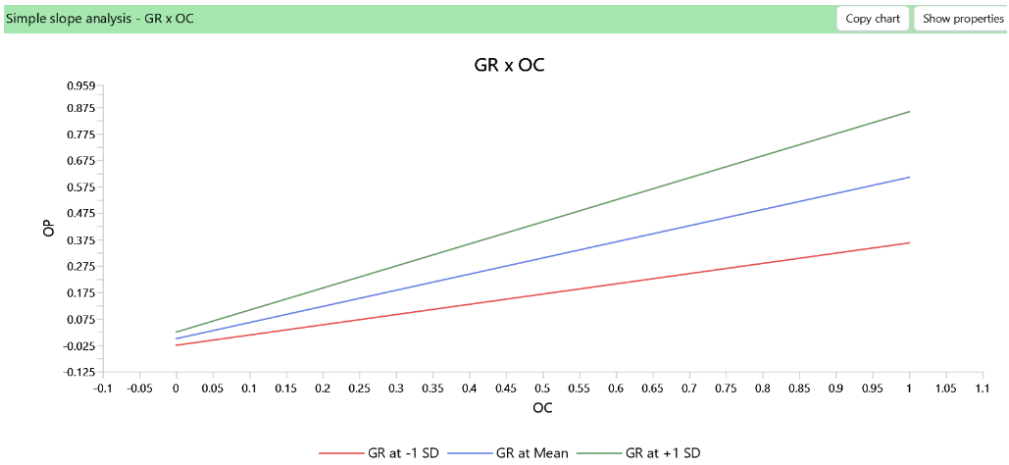

Figure 6: Slope Analysis for Joint Effect

Figure 8 shows the slopes of the predictors for the joint effect model at three levels of the moderator, i.e., low, mean, and high levels obtained from PLS-SEM analysis. The slopes show how the strength of the independent-dependent variable correlation varies depending on the moderator's value. In this model, the slope is very steep and widens at the top, implying that there is a very strong joint moderating effect of the predictors on the dependent variable. This is confirmed by the rise in R^2 from 0.442 before moderation to 0.498 after the moderation effects.

Total Effect Analysis

The total effect analysis displays the interaction of the three exogenous variables on the endogenous variable, organizational performance, and the effect of the inter-variable correlations, which were obtained from PLS-SEM analysis outputs for the joint effect model. It shows that the strongest relationship is between organizational characteristics and operational performance (β = 0.610, t =7.372, p = 0.001), followed by stakeholders' management and operational performance (β = 0.150, t = 2.376, p = 0.028) are statistically significant. The

weakest link is the relationship between governance reforms and operational performance (β = 0.025, t = 2.161, p = 0.036). This relationship is statistically insignificant since the standardized path coefficient, which is 0,025, is less than 0.1. The moderating effect of governance reforms (β = 0.223, t =3.725, p = 0.014) is statistically significant. and the interaction effect of stakeholders' management (β= -0.110, t=2.586, p = 0.023) is also statistically insignificant. The particulars of joint effect analysis are detailed in Table 7.

Table 7: Analysis of Total Effect

Hypothesized Path Relationship	Total Effect	T Statistics	P Values
Governance Reforms-> Operational performance	.025	1.947	.053
Organizational characteristics--> Operational performance	.610	5.386	.001
Stakeholders' management-> Operational performance	.150	2.765	.012
ME: Stakeholders' management-> governance reforms and Operational performance	-.110	6.376	.007
ME: Governance Reforms-> Organizational characteristics and Operational performance	.223	3.725	.003

ME Moderating Effect

From the analysis of the joint effect of interactions of the variables in Table 8, it is deduced that all the hypothesized path relationships, including inter-variable interactions, are statistically significant except the one between governance reforms and operational performance. This is deduced from the fact that in all cases save for the path between governance reforms and operational performance, the t-statistics are above the minimum threshold of 1.96, and all the p-values are less than the threshold of 0.05. It is, however, noted that governance reforms have a positive and significant interaction effect of moderation with a standardized path coefficient of 0.223 on the link between organizational characteristics and operational performance, with a p-value less than 0.05. This means that in the joint effect model, after applying the interaction of moderation effects, organizational characteristics are the strongest predictor of operational performance, followed by the moderation effect of governance reforms and the moderation effect of stakeholders' management in that order.

Analysis of the Coefficient of Determination for the Four Models

The hypothesis undertook to test if the variance explained, R^2 for the combined effect model with organizational characteristics, governance reforms, and stakeholders' management, was not significantly greater than the individual effect of each exogenous variable. The results of R^2, for each model are summarized in Table 8.

Table 8: Coefficient of Determination for all Objectives

Objective	R^2	R^2 After Moderation
Organizational characteristics ->Organizational performance	42.5%	
Stakeholders' Management	43.4%	43.4%
Governance reforms	43.6%	47.8%
The joint effect of three exogenous variables	44.2%	49.8%

Information Table 8 shows that the R^2 value for the joint effect was 0.442 before moderation. This increased to 49.8% due to the joint effect of the three exogenous variables. The R^2 for the effect of organizational characteristics and operational performance was 0.42.5%. The R^2 for governance reforms on the correlation between organizational characteristics and operational performance was 43.6% but this improved to 47.8% due to the effect of moderation (Figure 5), while the R^2 for the moderation by stakeholders' management on the correlation between organizational characteristics and operational performance was 0.434, and this remained constant even after the moderation effect. These results confirm that the R^2 for the joint effect, which was the largest at 44.2% before the application of the moderation effect, improved strongly to 49.8%. The results confirm that hypothesis four was not supported since the combined effect of organizational characteristics, governance reforms, and stakeholders' management was significantly larger than the individual effect of each variable.

STUDY FINDINGS

The objective for undertaking the research was to verify if the combined effect of organizational characteristics, governance reforms, and stakeholders' management would be larger than the individual effect of each variable on the performance of seaports in Africa. To answer the research question, a hypothesis and structural model were proposed, comprising an independent variable, organizational characteristics; a moderating exogenous variable, governance reforms; a moderating exogenous variable, stakeholders' management; and an endogenous latent variable, operational performance. The tests of reliability were undertaken for all four latent constructs, and all their measurement indicators had individual reliability levels higher than the minimum of 0.4 threshold specified by [29]. The Cronbach Alpha values for the structural model were above the minimum threshold of 0.7. Likewise, the composite reliability values were also higher than the minimum limit of 0.7. Internal consistency reliability values of the four constructs in the structural model were established based on the two tests.

Convergent validity was confirmed since AVE values were higher than the limit of 0.5. The discriminant validity was assessed and confirmed by using the Fornell–Larcker criterion whose conditions were all met, and HTMT ratios which were lower than the threshold of 0.85 The measurement indicators for the latent constructs were all statistically significant and loaded highly on their associated latent variables, than any other variables, as a confirmation of both convergent and discriminant validity on the outer model. The assessment of collinearity was done for both the inner and outer models by use of VIF and tolerances. The VIF values were lower than the maximum level of 5, and all the tolerances were higher than the minimum of 0.2, as confirmation that there was no collinearity in both models.

The null hypothesis, which was the subject of the empirical testing, stated as follows:

- H1**:** The combined effect of organizational characteristics, governance reforms, and stakeholders' management is not significantly greater than the effect of individual exogenous variables on the operational performance of seaports in Africa.

PLS SEM analysis results validated the significance of factor loadings for the outer model. For a ratio to be acceptable, the ratio of SRMR should be below 0.1 [46]. SRMR was significant and

equal to 0.111, while the NFI value was 0.754 to confirm model fitness as recommended by [44]. The SRMR was slightly higher than 0.1, and NFI was slightly lower than 0.9 due to the small sample size [42]. The predictive relevance, Q^2, was found to be 0.275, which was above 0, thus acceptable. The model, therefore, satisfied the requirements for a good fit [40]. Bootstrapping with 5000 sub-samples was applied to test the significance of the path coefficient of the inner model. The results confirmed that the path coefficient of the inner model was positive and significant.

According to [46], the effect size, f^2 of an exogenous variable, which is the drop in R^2 if the variable is excluded from the model, should be 0.35 for large, 0.15 for moderate, and 0.02 for low. The f^2 value for organizational characteristics was 0.522, which is large, while that of governance reforms was 0.001, which is considered low, and that of stakeholders' management was 0.030, which is midway between moderate and large. This implies that, if the integration of organizational characteristics and stakeholders' management is not included in this model, the explained variance of operational performance would be small. But if governance reforms were not included in the model, the effect on the explained variance, R^2, of operational performance would be large.

The null hypothesis was tested using PLS-SEM analysis. The outcomes exhibited that the joint effect of the three exogenous variables explained 44.4% of the variance in operational performance. The effect of the independent exogenous variable, organizational characteristics, explained 42.5% while the moderating variable, stakeholders' management, explained 43.4% and governance reforms explained 43.6%. Since the explained variance from the joint model of 44.4% was the highest of the three models, the null hypothesis was not proven.

Table 6 shows the hypothesized path relationship between the four latent variables for the joint effect. The verdicts of the total effect results for the joint model indicate that the strongest impact was between organizational characteristics and operational performance ($\beta = 0.610$, $t = 7.372$, $p = 0.001$); followed by stakeholders' management on operational performance ($\beta = 0.150$, $t = 2.376$, $p = 0.028$); and governance reforms on operational performance ($\beta = 0.025$, $t = 1.947$, $p = 0.053$); then the combined effect of moderation of stakeholders' management and governance reforms upon the correlation of organizational characteristics and operational performance ($\beta = 0.223$, $t = 3.376$, $p = 0.017$) while the moderating effect of stakeholders' management ($\beta = -0.011$, $t = 1.586$, $p = 0.523$). Finally, the simple slope analysis confirms that the joint moderation model has a powerful moderation effect.

The null hypothesis stated that the combined effect of three exogenous latent variables, organizational characteristics, governance reforms, and stakeholders' management, would not be significantly larger than the effect of each latent variable on the performance of seaports in Anglophone Africa. However, from the coefficient of determination results for the joint model in Table 7, the R^2 value for the link between organizational characteristics and operational performance was 0.425. The explained variance, R^2, for the moderation effect between governance reforms and operational performance was 0.478. The R^2 value for the effect of stakeholders' management on the correlation between organizational characteristics and

operational performance was 0.434. The R^2 for the joint effect model was the largest at 0.498 after the joint moderation effect. This was expected because the direct effect and the two moderating effects are in one model. Therefore, it follows that there was no support for the null hypothesis because the effect of the joint model was larger than the individual effect of each of the latent variables on the performance of seaports in Anglophone Africa. The explained variance for the joint model, including organizational characteristics, governance reforms, and stakeholders' management explained 44.4% of the variance in operational performance which rose to 49.8% due to the joint effect of the interaction of moderators compared to the model with organizational characteristics (42.2%), governance reforms (47.8%) and stakeholders' management (43.4%). The foregoing models helped to answer the research question by explaining the individual effect of each variable and the joint effect of organizational characteristics, governance reforms, and stakeholders' management on the performance of seaports in Anglophone Africa.

The study therefore answered the research question, "What is the joint effect of organizational characteristics, governance reforms, and stakeholders' management on the performance of seaports in Anglophone Africa?" The study answered the research question by revealing the individual effect of each variable, organizational characteristics, governance reforms, and stakeholders' management on the performance of seaports in Africa, and the joint effect of all three exogenous variables on the performance of seaports in Africa. The study contributed to new knowledge by revealing that the highest level of performance for seaports in Africa is achieved only when all three independent variables are applied together in one model, with the strongest predictor of performance in the model being organizational characteristics, followed by the moderating effect of governance reforms and stakeholders' management in that order.

The results of this study confirm the findings of [7] that, from the reforms in seaport governance that have been undertaken globally, the landlord model is the most common model for port administration in more than 80% of ports worldwide. Consequently, changes in port governance and management are, in other words, a domain for potential stakeholder conflicting interests [26]. The stakeholder theory is involved in a changing process where the actors experience difficulties in finding an operating reform model considered fair to all stakeholders [21]. They further aver that the question concerns who benefits, and the implications of redistributing power and responsibility among public or private, labor or capital, and global or local actors are issues for serious conflicts that require stakeholders' management.

In the joint effect model, organizational characteristics were confirmed as the strongest predictor of performance for seaports in Africa, followed by the effect of the interaction of moderation of governance reforms on the link between organizational characteristics and operational performance, and the effect of the moderation of stakeholders' management on operational performance in that order. The results also confirmed that the strongest moderating effect in the joint effect model came from governance reforms, while stakeholders' management had a negative and the weakest moderating effect. This finding implies that while stakeholder theory would usually be applied to mitigate disagreements and conflicts at the

initial stages, when the situation stabilizes and good performance takes root, then stakeholders' management role appears to be minimized. In contrast, governance reforms maintain a very strong moderating effect because the resulting changes in governance structures are felt in all spheres, like in infrastructure improvement, equipment modernization, labor, and daily management and operations. These results confirm the findings of [21, 25, 27] that reforms in port governance structures are spheres for the prospective conflicting interests of stakeholders, which render stakeholder theory critical in mitigating change from the status quo to new models of governance reforms as an impetus for improved port performance and sustenance of competitive advantage.

CONCLUSION OF THE STUDY

A key conclusion of this research is that organizational characteristics emerged as the strongest predictor of organizational performance for seaports in Africa for the direct effect model and for each of the two models with governance reforms and stakeholder management as moderators, and finally for the joint effect model with three exogenous variables. This finding agrees with earlier findings by [3,4,5], whose studies found that seaport characteristics were the main contributors to the performance of seaports in Europe and Asia. The second conclusion of the study is that reforms in governance structures improve organizational performance, as affirmed by the positive and significant moderating effect of governance reforms on the relationship between organizational characteristics and operational performance. A literature review confirmed that ports that have undergone governance reforms have excelled and exceeded their previous performance levels, as affirmed by [21, 48] that reforms in governance lead to enhanced seaport performance. Governance reforms must therefore be carried out for all seaports in Africa in support of the African CEOs forum held in 2021, which resolved to take urgent measures that would improve the performance of seaports in Africa.

The third conclusion of the study was that for the model with stakeholders' management as a moderator, it emerged as a good predictor of organizational performance initially, but the moderating effect remains the same thereafter; however, for the joint effect model, stakeholders' management emerged as the second strongest predictor of organizational performance after organizational characteristics, followed by governance reforms. The explanation is that after carrying out the requisite reforms in governance structures for seaports in Africa, effective application of stakeholder theory to mitigate the ever-emerging stakeholder areas of interest is a prerequisite to achieving high organizational performance, which results in gaining a competitive advantage.

The fourth conclusion of the study is that the highest possible level of organizational performance is achieved when all three exogenous latent variables are applied jointly. The application of all three independent variables catapulted the performance to a higher level, which was further enhanced by the joint effect of the moderation interaction. The implication is that the application of the three variables jointly is what will sustain competitive advantage for seaports in Anglophone Africa, as observed by [21].

This study finally concludes that it responded positively to the resolution of the African CEOs forum of 2021, which directed that Port Authorities in Africa take measures that would improve the performance and competitiveness of African seaports. Those measures included governance reforms to attract public-private partnerships for financing port development [18]. This will enable them to improve their inferior performance and gain market share of cargo destined for developing countries, where the share of African ports was only 1% [15].

CONTRIBUTIONS TO KNOWLEDGE, PRACTICE, AND POLICY

The study adds to new knowledge and addresses the shortcomings of previous studies by contextualizing seaport characteristics in Africa. The findings have expanded the body of new knowledge by improving the port characteristics model that was already developed by earlier researchers in studies carried out mainly in Europe, Asia, and the Americas. The main contribution to new knowledge is that this is the only known study that has combined all four variables in one model using PLS-SEM analysis and contextualizing in seaports in Africa, thereby resolving the geographical and contextual gap and the conceptual gaps. Another new knowledge is that when the three exogenous variables are applied jointly in one model, it results in the highest possible level of operational performance for seaports in Africa.

Practitioners like seaport managers, shareholders, government, and regulators will enjoy the benefits of new knowledge on improving seaport performance. The policy makers will strategize on new port development by carrying out governance reforms and stakeholder management as a way of not only improving the performance of the seaports. They will also be able to plan for new commercial seaports and expand existing ones by making strategic investment options based on a foundation of information and knowledge. The economic benefits to be derived from such a huge investment in port infrastructure include direct and indirect businesses in the industry by private investors, which will also create both direct and indirect employment.

STUDY RECOMMENDATIONS

The findings of this study from experiential authentication confirmed that governance reforms had a significant moderating effect on the relationship between organizational characteristics and performance of seaports in Anglophone Africa. It has resulted in enhanced performance in ports that have applied them successfully. It is therefore recommended that all seaports in Africa that are still in public service management should undertake immediate reforms in their governance structures to improve their performance.

It is also therefore recommended that management of stakeholders be undertaken not only in existing seaports but also when undertaking new seaport infrastructure projects to mitigate conflicts. It is therefore recommended that all seaports in Africa should undergo reforms in their governance structures and embrace management of stakeholders' concerns as a way of attaining and sustaining high performance and gaining a competitive advantage. These actions will enable the ports to achieve higher productivity, create new direct and indirect employment, and improve the economic well-being of the local communities.

LIMITATIONS OF THE STUDY

One such downside to the study was that it focused on interviewing port executives alone, whose views could be considered subjective, and not port stakeholders like shareholders, shipping lines, clearing and forwarding agents, government agencies, regional governments, port regulators, transporters, suppliers, and employees from the respective seaports in Africa. Because the stakeholders are many and varied, their contributions would result in a higher sample size that will greatly improve the values of model fit indices.

AREA FOR FURTHER RESEARCH

The business environment is dynamic, with continuous technological advancement and automation of port operational systems, and the introduction of more efficient and productive port equipment. In addition, the ever-changing customer demands, with a strong possibility that efficiency improvements may also take an evolutionary pathway, it is therefore anticipated that variables such as organizational characteristics, governance reforms, and stakeholders' management may also exhibit the same nature of dynamism due to changes in the environment. Given the dynamic nature of the latent variables, the current findings have the potential to change over time; therefore, it is necessary to consider the use of longitudinal surveys in the future.

Future similar studies should target seaport stakeholders as respondents to remove the possible subjectivity of port executives and increase sample size to achieve better model fit indices and increase realizable external validity. The study could take the direction of undertaking comparable studies per region, for example, African, Asian, Far East, the USA, and European ports. In such cases, the questionnaires should include cross-cultural questions to determine whether disparities in cultural practices could impact regional seaport performance. It may also help to explain why specific governance reform models have been seen to succeed in some regions but are less successful in other regions.

Future studies could also investigate to what extent the characteristics influence each other, and how they contribute directly or indirectly to port performance. It would also add to the body of new knowledge to establish whether it is the quality and professionalism of seaport terminal management or the characteristics and reforms in governance that give rise to enhanced performance.

It will also be necessary to conduct a study to establish the effect of the two moderating variables, governance reforms and stakeholders' management, on each other in the joint effect model. Finally, future studies should attempt to develop one theory that combines all four theories of this study into just one theory that would enable seaports to improve their performance and enable them to gain and sustain a competitive advantage.

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