

The Impacts Of Port Characteristics And Port Logistics Integration On Port Performance In Ethiopian Dry Ports

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Abstract

Purpose: This paper identifies the impacts of port characteristics and port-logistics integration on port performance in the case of Ethiopian dry ports.

Research Methodology: To complete the study, we used structural equation modeling to test the relationship between port characteristics and port-logistics integration with port performance. Moreover, Statistical Package for Social Science is also used to filter indicators. Apart from this, the study was conducted in three dry ports of Ethiopia having a sample of 279 employees.

Results: The finding shows that port characteristics such as port infrastructure, port connectivity, and port privatization have significantly impacted port performance. Also, port-logistics integration has an impact on both port operational performance and port efficiency.

Limitations: The main limitation is that the study focused only on three dry ports of Ethiopia which do not include other dry ports in the country.

Contribution: Ethiopia suffered forced dependency on transit countries after a bloody war with Eritrea which resulted in customs delays at port. To reduce this, the study suggests that Ethiopia should coordinate in developing joint infrastructures, and formulating unfettered rules and regulations with its transit countries.

Keywords: Port characteristics, Port logistics integration, Port operational performance, Port efficiency

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1. Introduction

Due to the landlockedness, the port operation in Ethiopia has been dependent on Djibouti in which almost 95% of importing and exporting operations carried out started from the bloody conflict with its northern corridor transit neighbor, Eritrea where 75% of Ethiopian import and export operation passed through Assab port until 1997 with a duty-free. Thereupon, Ethiopia has incurred high transport costs and paid huge demurrage fees to Djibouti, large economies of scale remain unexploited, and production, therefore, is inefficient ([Ali, 2021](#); [Debela, 2013](#); [Forozandeh, 2021](#)).

[Lahiri and Masjidi \(2012\)](#) argue that approximately 20% of the countries in the world are landlocked and they are distributed as approximately 40% of the world's low-income economies and less than 10% in the world's high-income countries. Undoubtedly, the statistics show that there is the existence of unique economic problems in landlocked countries.

Unfortunately, these countries experienced transit delay, dependency on transit countries ([Faye, McArthur, Sachs, & Snow, 2004](#)); limited regional integration, institutional bottlenecks ([Alemu & Dachito, 2020](#)), and quality problems ([Carmignani, 2015](#)); ([Charuka, 2014](#)), infrastructural constraints, and cumbersome border crossing ([Charuka, 2014](#)), longer cargo dwelling time and inefficiency of a crane at the terminal in turns add pressure on hinterland which reduce the productivity of port terminal and reduce port performance.

The [East Africa Logistic Performance Survey \(2014\)](#) report shows that the average time takes for the truck to leave the port (turnaround times), and deliver cargo to a designated destination within east African countries is very high. This makes the region record the lowest average logistics performance indexes. The work of [Nyema \(2014\)](#) also mentioned that the efficiency of the container terminal is affected by the high regulatory burden. To conclude, this problem is intensified due to the lack of intermodal connectivity and one-stop border crossing mechanisms in the region.

Surprisingly, sub-Saharan African customs delays are the longest average of 12 days in the region as compared with 7 days in Latin America. Exceptionally, Ethiopia recorded the longest delays in the region where the trader has to wait more than 30 days for customs to clear goods and it makes challenging for Ethiopian traders and customs operators ([Kassahun, 2014](#)). This is mainly due to forced dependency on transit countries, complicated customs procedures, complex bureaucracy at the port, and lack of efficient infrastructure characterized by a missing link from one road to another have played a major role in the custom delay in Ethiopia.

[Wilmsmeier, Hoffmann, and Sanchez \(2006\)](#) noted that better port infrastructure may improve efficiency, but increase port charges and also the overall transport costs. Port privatization may lead to new investment, but it may also coincide with reduced public subsidies, leading to higher charges to port users and their finding shows that increases in port efficiency. Port infrastructure, private sector participation, and inter-port connectivity all help to reduce the overall international maritime transport costs. [Wilson, Mann, and Otsuki \(2003\)](#) found that port efficiency has a strong impact on bilateral trade flows. The United Nations Office of the High Representative for the Least Developed Countries noted that LLDCs pay more than double what the transit countries incur in transport costs and take a longer time to spend and receive cargo from abroad ([UN-OHRLS, 2016](#)).

In reviewing studies, we found that several research gaps have had in this area; for example past studies were focused on examining the effect of port resource and sustainability practices on port operational performance ([Bonaya, 2021](#)); port supply chain integration and its relationship with port performance ([Abadli, Kooli, & Otmani, 2020](#); [Han, 2018](#); [Song & Panayides, 2008](#); [Tongzon, 1995](#); [Woo, Pettit, & Beresford, 2011](#)) to mention a few. Subsequently, there are several studies on seaports, but very limited on dry ports especially in landlocked countries, for instance, port integration into global SCs ([Alavi, 2019](#)). [Host, Pavlić Skender, and Mirković \(2018\)](#) also assessed port logistics integration challenges and approaches. Other studies were also conducted on the roles of dry port operations on container seaport competitiveness ([Jeevan, Chen, & Cahoon, 2019](#)). Especially, [Shi \(2015\)](#) reveals that the port logistics research is still in the immature stage and the definition of port logistics has not yet reached a consensus. In conclusion, this paper contributes one stage ahead in this topic.

Likewise, few empirical studies have confirmed the positive roles of logistics performance between the quality of port infrastructure and national economics. Therefore, our study aimed to fill these gaps by exploring the effect of port characteristics and port-logistics integration on dry port operational performance and terminal efficiency in which previous studies have focused on the effect of some port characteristics on maritime transport cost ([Wilmsmeier et al., 2006](#)) and seaborne trade ([Munim & Schramm, 2018](#)). And this paper investigated the antecedents of port efficiency of dry ports that may improve port terminal efficiency.

Hence, this paper addressed the following four research objectives:

1. To examine the effects of port characteristics on the port operational performance of Ethiopian dry ports.
2. To investigate the effects of port logistics integration on the port operational performance of Ethiopian dry ports.
3. To explore the effects of port characteristics on the port efficiency of Ethiopian dry ports.
4. To investigate the effects of port logistics integration on the port efficiency of Ethiopian dry ports.

2. Literature review

2.1 Port Characteristics of Port Operational Performance

Investments in port infrastructures lead to equivalent improvements in port performance in turn enhancing port efficiency by enlarging the port's capacity ([Garcia-Alonso & Martin-Bofarull, 2007](#)). Usually, container handling equipment is viewed as the main machines for dry ports as well as seaports, and they can greatly influence both the container handling capacities and, in turn, the performance of dry ports ([Chandrakant, 2011](#)). Ports' surface infrastructure condition is crucial to port performance ([Clark, Dollar, & Micco, 2004](#); [Turner, Windle, & Dresner, 2004](#)). The port's strategic location, accessibility, state-of-the-art facilities, and equipment are some of the factors crucial in making the port one of the world's largest and most modern container ports; port infrastructure improvement in terms of stockpile location, labor, and flexibility (loading) is mainly improved the operational performance of a given port ([Rozar, Razik, & Sidik, 2018](#)).

A study by ([Cheon, Song, & Park, 2018](#)) shows that a shift in port business landscapes and escalating environmental selection due to global competition requires ports to delineate aggressive strategies and actions to avoid rivals' threats and to shed operational inefficiency. According to ([Cullinane and Wang \(2009\)](#), most ports made high infrastructure investments to reduce operational costs and improve service quality, which are important determinants of terminal performance. Moreover, [Liu \(1995\)](#) states port ownership and management is one of the characterizing factors that influence port performance and efficiency.

We also argue that port characteristics (i.e. port infrastructure, port connectivity, and port privatization) affect the operational performance of dry ports through port service quality, flexibility, delivery dependability, and cost minimization. Dry ports having adequate infrastructure such as container handling equipment, enough terminal size and forklifts will reduce truck/train stationing at the port, this in turn avoids congestion and allows quick services. Further, port connectivity also influences better port performance including speed and reliability of container handling services:

H1: Port characteristics have a significant effect on port operational performance

2.2 Port Characteristics of Port Efficiency

Terminal productivity studies, especially those concerned with the measurement of technical efficiency in container handling operations, mainly adopt container throughput as the single output variable. In this way, higher levels of container throughput will indicate greater levels of efficiency, with the same amount of inputs ([Haralambides & Gujar, 2012](#)). Thus, port efficiency also depends on port productivity which is affected by infrastructure efficiency (e.g. crane efficiency). Terminals will improve existing infrastructures, operation management, loading efficiency, and time performance to sustain their productivity ([Rozar et al., 2018](#)).

The efficiency of the dry port also logically depends on productivity, which is largely determined by the crane efficiency. [Tongzon \(1995\)](#) considers crane efficiency as a determinant of seaports' efficiency. [Park and De \(2015\)](#) also indicate that efficient crane operations can greatly influence the competitiveness of the port. In some cases, machine efficiency is considered together with the number of container handling equipment and considered as one determinant of the performance of the dry ports ([Chandrakant, 2011](#)). Reducing costs in the port requires the work of reducing bureaucracy in the port operation and improving managerial structures as well as obtaining managerial support. Otherwise, ports may incur high transitory costs under excessive instability which requires strong strategic capital

planning capabilities and risky new investments, without the benefits of instantly increased market share ([Delmas & Tokat](#)).

Ports should invest in new and existing infrastructure to maintain port efficiency and productivity. Port privatization is another determining factor of port efficiency ([Dube, 2022](#)); [Yuen, Zhang, and Cheung \(2013\)](#) found that the private sector involvement in managing ports can escalate the efficiency of the container terminal, while the container terminal whose share completely belongs to local people is less efficient. Further, they suggested that the port management model involving the private sector has increased the efficiency of the container terminal. [De Oliveira and Cariou \(2015\)](#) mentioned that private involvement plays a greater role in improving the effectiveness, efficiency, and ports productivity:

H2: Port characteristics have a significant effect on port efficiency

2.3 Port Logistics Integration on Port Operational Performance

[Sundaram and Mehta \(2002\)](#) identified that integrated logistics enables reaching goals related to all logistics chain partners, decreasing lead times and on-time delivery of cargo to consignees, lower final prices of products, as well as better quality and better services. For example, integration in terms of information enhances better communication between different port logistics partners and allows sharing of information, eventually assures the quality of port services and reduction of port operation costs ([Naab & Bans-Akutey, 2021](#)). The relatively poor performance of many landlocked countries can be attributed to distance from the coast ([Faye et al., 2004](#)). This is due to the lack of an intermodal system, a long distance from the sea, and poor regional integration. The intermodal system is an antecedent of the port networking system and also represents the transportation arm of the port logistic platform. The information system is responsible for fast efficient planning, stowage, tracking of shipments, and pre-notification of port entry and departure ([Bagchi & Paik, 2001](#)). This is often considered the major factor in the port organization affecting port operations ([Helling & Poister, 2000](#)). Besides, [Song and Panayides \(2008\)](#) show the effect of port logistics integration on port performance:

H3: Port- logistics integration has a significant impact on port operational performance

2.4 Port Logistics- Integration on Port Efficiency

An integrated mode of transport reduces cargo delay at the port and a dry port also plays a pivotal role to integrate modes of transport and reduce border crossing mandatories. Apart from this, logistics integration in port has many implications such as improved service level, cost reduction, improve productivity and maximize efficiency. [Pinmanee \(2016\)](#) stated that organizational integration, institutional support, and resource integration are part of logistics integration activities. These integrations determine port productivity and efficiency. [Chandrakant \(2011\)](#) stimulated that congestion in the means of transport especially in trucks led to port inefficiencies, eventually decreasing the total throughput and leading to dry port failure ([Charuka, 2014](#)). Hence, to overcome the logistics facilities have to integrate and co-operate at a multimodal level. Importantly, the work of [Nottboom \(2004\)](#) confirmed that logistics integration has redefined port and shipping industries. Indeed, the linkages between dry ports and policies such as logistics policy, multimodal transport, and transportation and trade facilitation policy affect dry port efficiency:

H4: Port- logistics integration has a significant impact on port efficiency

Conceptual Framework of the Study

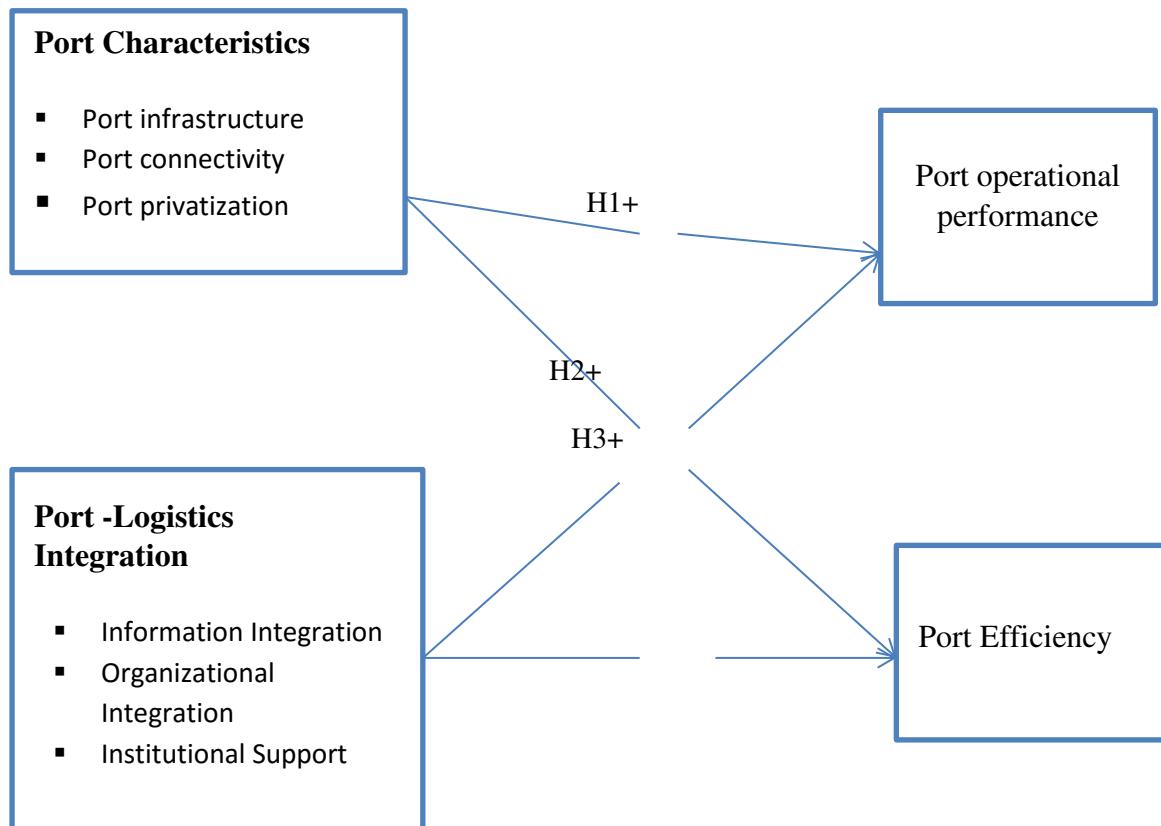


Figure 1: Conceptual model (source: Author elaboration)

3. Research methodology

3.1 Sampling and Data Collection

Three Ethiopian dry ports were the subject of this research. These are the dry ports of Mojo, Kaliti, and Kombolcha. We chose them based on statistics from the 2019-2021 throughput share of Mojo dry port (78.8%), followed by Kaliti dry port (11.9%), and Kombolcha dry port (2%) ([Bonaya, 2021](#)). We also used their current operational, functionality, and standards as a selection criterion for these three dry ports, such as human resource capacity, infrastructural development, terminal handling capacity from 2019 to 2021, and port equipment and overall facilities such as stackers, forklifts, container handlers, and terminal tractors. Finally, utilizing the purposive sampling approach of the non-probability sampling technique, we chose Mojo, Kaliti, and Kombolcha dry ports from six operating dry ports in the country.

The target demographic for this study was decided to be 926 respondents from all dry ports. To be clear, all of the respondents in this target population are permanent employees of the three dry ports, and the reason for emphasizing this number is to reduce sample error and to select the most appropriate respondents who have worked in each dry port for many years and experience because we believe they have a wealth of knowledge and experience in port operation. Finally, Yamane's 1973 sample size determination formula with a 95 percent confidence interval and 5% acceptable error was used to establish the total target population of the 279-sample responder. To acquire data from sample respondents, standardized five-point Likert scale survey questions in both English and Amharic were employed. The survey questionnaires were distributed face-to-face in each research location over a single time in 2020. Following that, we issued 279 questionnaires to each dry port's transit operator, management, and staff in order to collect data. Finally, we used 246 questionnaires to continue the data analysis process after subtracting 21 non-returned and 12 improperly answered questionnaires.

Data analysis was conducted using SPSS to purify measurement items through explanatory factor analysis. To test the proposed hypothesis and explore the relationship between variables structural equation modeling was employed.

3.2 Factor Analysis

Explanatory factor analysis (EFA) was conducted to explore the interrelationship of variables, remove redundant; unnecessary items, and simplify interrelated indicators. Before this, Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett's Test of Sphericity was conducted. The KMO noted a result of 0.909 indicated that the possibility to continue and perform factor analysis and there is the existence of good fit and observable variables are to be grouped into their underlying factor.

The factor analysis result presented in Table 1 shows that all items had a significant load value with their underlying factors above the cut-off point of 0.4. Apart from this, the Eigenvalue of one (1) and the value cumulative variance explained ranged from 45.10 to 87.10 indicating the amount of variance explained by each factor. We also tested the reliability of constructs using composite reliability and Cronbach alpha. Accordingly, composite reliability (CR) in table 2 indicated that the statistics satisfactorily meet the requirement of the minimum cut-off point (0.60) AVE is greater than 0.50 and the Cronbach alpha test is greater than the minimum threshold of 0.60.

Table 1. Explanatory factor analysis result

<i>Constructs</i>	<i>F1</i>	<i>F2</i>	<i>F3</i>	<i>F4</i>	<i>F5</i>	<i>F6</i>	<i>F7</i>	<i>F8</i>
<i>Port Characteristics</i>								
<i>Port Infrastructure</i>		.869						
Our port has an adequate number of terminals		.864						
Our port has adequate cranes and forklifts for loading and unloading containers		.829						
Our port has an adequate cargo handling capacity		.820						
We have enough trucks and trains for shipping cargo								
<i>Port Connectivity</i>						.834		
Our port has well-established international connectivity						.827		
Our port has well connectivity with other dry ports						.805		
Our port has connected with industrial zones/regions								
<i>Port Privatization</i>			.914					
Private companies invest in port equipment (e.g. crane, truck, forklift, etc.)			.914					
In our port, private companies perform cargo handling operations			.907					
There is a strong participation of private freight forwarders in our port								
<i>Port-Logistics Integration</i>								
<i>Institutional support</i>				.889				
Research for identifying and implementing the best practices in freight transport				.886				
Our port facilitates leases to improve the logistics of cargo distribution				.849				
Our port gains financial support from partners for logistics providers to build new facilities								
<i>Organizational Integration</i>					.843			
Our port collaboratively works with its customers					.816			

	Our port has encouraged teamwork within internal cross-functional teams in cargo distribution We have share skills, risks, costs, and rewards with our partners We have joint plans for prompt problem solving, maintaining long term relationships between partners				.715 .672				
Information Integration	We have shared useful information with our relevant logistics partners We have used advanced IT to book space for containers We have used advanced information technology to control container flow				.840 .832 .775				
	Port Performance								
Port Operational performance	We handle cargo on quoted or anticipated time We have a lower number of customer complaints We have provided reliable service consistently Our port is flexible in terms of volume and type of cargo Our port operation cost is low	.822 .820 .812 .784 .766							
Port Efficiency	Our port throughput per crane is high We have a short train/truck waiting time We have made efforts to increase cargo throughput						.806 .801 .798		
Eigenvalue		12.63	2.71	2.39	1.71	1.53	1.25	1.12	1.05
Variance %		45.10	9.68	8.52	6.12	5.47	4.45	4.00	3.78
V. cumulative		45.10	54.77	63.30	69.41	74.89	79.32	83.33	87.10

Note: Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) test = 0.909

Source: (Alavi, 2019; author's own development, 2022)

Table 2. Reliability test of constructs

Constructs	Cronbach alpha(α)	CR	AVE
Port Privatization	0.929	0.943	0.826
Port Infrastructure	0.940	0.941	0.799
Port connectivity	0.925	0.927	0.808
Information Integration	0.907	0.907	0.765
Organizational Integration	0.858	0.867	0.623
Institutional Support	0.964	0.965	0.901
Operational Performance	0.970	0.970	0.866
Port Efficiency	0.942	0.943	0.847

Source: (Own survey, 2021)

Respondent's Demographic profile

Nearly 66 percent of the 278 responses are men, while the remainder is women. Almost 63 percent of responders are between the ages of 26 and 35, with 5% being under 25 and 1.4 percent being over 55. According to table 1, over 83 percent of the respondents have completed their graduation. Employees were also discovered to have a lot of experience. Seventy-three percent of those polled had between six and ten years of experience. In addition, 4.3 percent of employees have more than 16 years of experience, while just 15.1 percent have fewer than five years.

4. Results and discussions

Structural Model

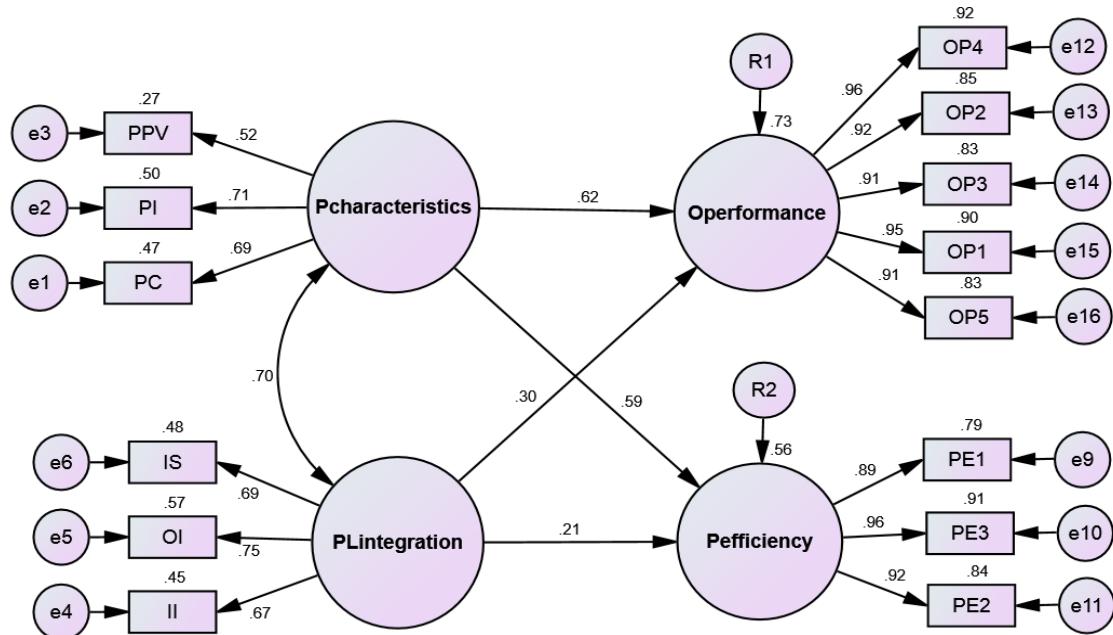


Figure 2. Structural model

Table 3. Goodness fit test of Structural model

Statistical fit index	Cut-off point	Recorded result
χ^2		187.48
DF		72 (P < 0.001)
GFI	≥ 0.90	0.898(marginal fit)
AGFI	≥ 0.90	0.851(marginal fit)
NFI	≥ 0.90	0.942(good fit)
RFI	≥ 0.90	0.927(good fit)
IFI	≥ 0.90	0.963(good fit)
TLI	≥ 0.90	0.953(good fit)
CFI	≥ 0.90	0.963(good fit)
RMSEA	≤ 0.08	0.071

Source: (Own survey, 2021)

From the path diagram depicted in figure 2, port characteristics have the highest path coefficient on port operational performance (O performance) which is 0.62 significant at P < 0.001. This indicated that a one standard deviation change in port characteristics would result in a 0.62 standard deviation change in port operational performance. In the same fashion, port characteristics (i.e. port infrastructure, port privatization, and port connectivity) boost the operational performance of Ethiopian dry ports through providing reliable port services consistently, on-time handling of cargo, reducing defects during handling and storing of cargo at the lowest operation cost.

Notably, our result is also supported by previous studies including [Chandrakant \(2011\)](#) where container handling equipment is viewed as the main machines for dry ports as well as seaports, and they can greatly influence both the container handling capacities and, in turn, the performance of the dry port. Also, [Rozar et al. \(2018\)](#) studies also show that port infrastructure improvement in terms of stockpile location, labor, and flexibility (loading) is mainly improved the operational performance of a given port. Further, as stated by [Nicolae, Ristea, Cotorcea, and Nistor \(2015\)](#), the main consequences of a low port performance are the speed reduction of operating the vessel and an increased residence time of the vessel at berth. They also added that reasons for poor port performance are time lost due to interruptions in operation, poor utilization of provided equipment, weak stacking and handling practices, insufficient training activity and / or its poor organization. Similarly, speed reduction in the operating of truck and train and an increased waiting time of the truck and train in dry ports will lead to low operating performance of the dry ports. This cause higher cargo handling cost in turn affects performance of ports.

[Liu \(1995\)](#) also suggested that port ownership and management is one of the characterizing factors that influence port performance and efficiency. The author also added that private ownership or management in port operation is more efficient than the public one because private ownership has a profit-driven objective, but public management has no more motivation to improve performance. Moreover, [Barros and Athanassiou \(2004\)](#) suggest that privatization has enhanced efficiency in ports. Based on the statistical result of the current study and the support of previous works, ***hypothesis (H1) was significant and supported.***

Additionally, port characteristics predict port efficiency with a path coefficient of 0.59 at $P < 0.001$. This shows that a one-unit change in port characteristics will result in a 0.59 increase in port efficiency. Besides, port characteristics such as (sufficient terminal size, adequate number of cranes and forklifts for loading and unloading of freights, enough trucks and trains for shipping cargos, involvement of private companies in port operation, intermodal connectivity with rail, highway, and road connectivity with other dry ports and connectivity with industrial zones) would increase port efficiency through maximizing port throughput of crane/trucks and reducing truck/train waiting time. Our finding is also consistent with a linear regression test conducted by [Caldeirinha, Felicio, and Coelho \(2006\)](#) that port efficiency is influenced by port infrastructure. ***Hence, H2 was supported.***

Further, from the results of structural equation modeling in figure 2, it can be understood that port logistics integration explains port operational performance with a path coefficient of 0.30 at $p < 0.01$ significant level. This shows when port logistics integration goes up by 1% standard deviation will result in a 30% change in port operational performance. This implied that port logistics integration includes; sharing information with logistics partners, the use of advanced information technology, sharing of skills, risks, costs, and rewards with partners, a joint plan for prompt problem solving and maintaining long term relationships between partners, working in collaboration with customers, obtaining financial support from institutions and research for identifying and implementing best practices in freight transport were improved Ethiopian dry port operational performance. Regarding this, [Thai \(2016\)](#) indicated that the level of information communication technology applications in port operations is an important element of port service quality. Logistics integration can benefit supply chain structure and firm performance in the long run ([Abadli et al., 2020](#)).

Undoubtedly, we also supported that port logistics integration increases port operation performance in terms of reducing port operating costs, maintaining better service quality, decreasing waiting time, on-time delivery of cargo, enhancing communication between logistics partners, and lowering transit or lead times. **Therefore, H3 was supported.**

Concerning H4; it was indicated that port logistics integration significantly affects the efficiencies of dry ports. From figure 2, we observed that port logistics integration has a significant effect (0.21) on port efficiency at $P < 0.05$. In another way, it means that a 1% change in port logistics integration would lead to a 21% increase in port efficiency. Information integration, organizational integration, and institutional support in ports have enhanced port efficiency (i.e. increasing throughput and reducing train/truck dwelling time). For instance, information integration through enterprise resource planning can create communication networks between port partners, provide faster services, enabling better controlling and tracking of cargo. This in turn assures port efficiency by maximizing productivity and throughput.

The result is consistent with past studies [Caldeirinha et al. \(2006\)](#) shows that logistics integration influences port efficiency. We suggest that port logistics integration (information integration, organizational integration, and institutional support) improves dry port efficiency on throughput and reduces truck/train waiting time. **Thus, H4 was accepted.**

Table 4. Summary of Hypothesis Results

H	Relationship	Estimate(Direct effect)	Hypothesis Result
H1	P Operational Performance <--- P Characteristics	.62***	Supported
H2	Port Efficiency <--- Port Characteristics	.59***	Supported
H3	P Operational Performance <--- Port Logistics Integration	.30**	Supported
H4	Port Efficiency <--- Port Logistics Integration	.21*	Supported
*** Significant at P < 0.001, ** Significant at P < 0.01, and * Significant at P < 0.05			

Source: (Own survey, 2021)

5. Conclusion

To summarise, the finding of the study confirmed that port operational performance and efficiency are influenced by port characteristics and port logistics integration. Chiefly, port characteristics i.e. port infrastructure (cargo handling capacity, sufficient terminal size, adequate number of cranes and forklifts for loading and unloading of freights, and enough trucks and trains for shipping cargos); port privatization (involving private companies in cargo handling operation and participation of freight

forwarder in the port); and port connectivity (having intermodal connectivity with rail, highway, and road, connectivity with other dry ports and industrial zones) highly influence port operational performance and efficiency with a standardized factor loading of 0.62 and 0.59 respectively. Secondly, they were also affected by port logistics integration with path coefficients of 0.30 and 0.21. Truly, this study implies that port operational performance and efficiency are largely explained by port characteristics (i.e. port infrastructure, port privatization, and port connectivity).

As a practical implication, Ethiopia should follow a renewable forward-looking approach with its neighbor transit countries and advocate strengthened partnership. In the same fashion, the dry port operation procedures must also improve its service offering approach by simplifying customs documents and formulating unfettered standardized rules and regulations to reduce customs delays at the port. Above all, the government should upgrade railway and road infrastructure and complete missing links to foster connectivity. Moreover, countries should have to coordinate to develop a joint infrastructure. Also, the country shall propose strategies to use the northern corridor that was used before a political war with Eritrea.

Limitation and Recommendation for Study

We believe that this study completed its objective, but there is some limitation that should be mentioned. On this occasion, this work concentrated only on three dry ports and does not include other ports in the country which are currently operating port functions. Thus, it will be better if future studies include those ports (namely, Semera and Wereta) to reach a more generalized conclusion. Coupled with, indeed for more than two decades Ethiopia was passing through dependency on Djibouti port, but now in 2021, the country had a miracle transition from landlocked country to seaborne by having 19% share of Berbera port. Consequently, we recommend future academicians conduct research on the roles of this port in the Ethiopian economy and make a comparative analysis when the port starts its full potential functional operation.

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Appendix Amharic Version of Survey Questionnaires

፩፪ የኩሽኬት

በበትና አካምና ከፈፅ

የአዲስአበባ ቴራንስፖርት አስተዳደር ትምህርና ከፍል

መጠቃቅ

የሚገኘ ስተዳደሩዎች

በለ ት-ብርርም ከዚህ ስርዓት አገልግሎት የአርባው ምልሽና ተስተና ይህ ትናት እንዲሰራ ምክንያት ሆኖል::

እኝ እንደሸስት አል እና አባት አየልኝ ከዚህ የኩሽኬት የበትና አካምና ከፈፅ የወደብ ማርያምና የአዲስአበባ ቴራንስፖርት በአትናቸው ይረዳ ወደዚያ ላይ የአቶዎች ተቋክቶ ወረዳ የኩሽኬት እንደሸስት እንደሸስት:: እርከምም ከነዚዎች ተቋክ ይችሞምናን ስጥተው ይህንን መጠቃቅ እንደሸስት በትሸትና እንደሸስት::

ወደ ተስተናዎች፣ ይህ መጠቃቅ ወደዚያ ማርያምና የአዲስአበባ ቴራንስፖርት በአትናቸው ይረዳ ወደዚያ ላይ በአቶዎች ተቋክቶ ወረዳ መረጃን የሚሰጠበት ነው:: የአርባው ተስተናዎች መሠረት በመሠረት በፈቃድናት ላይ የተመሠረት ለመን የምንሰበሰውም መረጃ ማስተርጓኑ፣ የተጠበቀ እንደሸስት እናረጋግጣዎች:: የአርባው አውነተኛና ወጪ ያለው ምልሽና ለዚህ ትናት ወጪ የለው ምልሽና ለዚህ ትናት ወጪ የለው ምልሽና ለዚህ ትናት::

አጠቃላይ ማስሰጠዎች

- ከምምነት መረጃ እያከለፈዋል::
- የሚጠቀሱት በሚያገኘበት ወጪ መልክምና ማከበብ ይችላል::

አድራሻ

የመጀመሪያ የሚከተሉት ተቋክ ከፈፅ በሚከተሉት ቀጥሪያ ለመተካት ይችላል:: ስልክ:: 09-10-06-22-70 / 09-60-26-08-541 አ-ማይድ:: enдрisali05@gmail.com / abateay36@gmail.com

ወደ የሚከተሉት ተቋክ ከፈፅ ከዚህ ስርዓት አገልግሎት::



1

ከፍል አንድ፡፡ ለመደብ ስህርት መሰከም የተወስኑ መጠረቃች

እርስዎ ያለበትን ይረዳ መደብ ስህርትን በተመለከተ እባክዎን ከሚከተሉት መግለጫዎች ወርምንና የሚሰጠበትን መረጃ የሚያስቀመጥኑን ይረዳ የሚመከለውን ቁጥር የከበለ::

የምርመራ ሲከለው፡ በለ አምስት-ኋጥብ የአይክርና ሲከለ ዓይነ:: 1 = በጣም አልሰማማኝ
(በአ)፣ 2 = አልሰማማኝ (አ)፣ 3 = መመሰን አልቻልም (መአ)፣ 4 = አልመማላሁ (አ)፣ 5 = በጣም አልመማላሁ (በአ)

በመደብ ላይ የግል ተቋማት ተስተር						
ከፍ	የቋቀምች	በአ	አ	መአ	አ	በአ
PPV1	በመደብና ወሰኑ የግል ከባንያዎች የክርን ጥናት ያከበለ::	1	2	3	4	5
PPV2	በመደብና ወሰኑ ከፍተኛ የግል ጥናት ተስተርና ይከበለ::	1	2	3	4	5
PPV3	የግል ከባንያዎች በመደብ መሰረቶዎች ላይ መዋዕለ-ንዋጅ ያረሰለ፡ (አምስት-ኋጥብ ከሱን፣ የሚገኘ መከና፣ ይርከ-ለይት መዘገብ.)	1	2	3	4	5
የመደብ መመራት-ለማት						
ከፍ	የቋቀምች	በአ	አ	መአ	አ	በአ
P11	ወደባቸኑ ጥናትን የመሽከም በቋኑ አለው::	1	2	3	4	5
P12	ወደባቸኑ በቋ ቁጥር የአቶ ተርጓሜዎች አለው::	1	2	3	4	5
P13	ወደባቸኑ ከን-ይ-ይ-ና-ቸኑን ለመመንና ለማውረድ የሚሆኑ በቋ ከራይና ይርከ-ለይቶ አለው::	1	2	3	4	5
P14	ወደባቸኑ ጥናትን ለማንኛው በቋ መከና እና ባብር አለው::	1	2	3	4	5
የመደብ ተጠናት						



ከፍል ሁለት፡- የወደፊት ለአዲስአበባ ተከናወል መጠይቷል

የወደፊት ለዚህተትና ትኩስ በተመለከተ እናወጪን ከሚከተሉት መግለጫዎች ይርጉም የሚሰጠው በትን ወይም የሚያስተካክለ የሚመለከት ይረዳ የሚመለከውን ቅጥር ያከበብ::

የምርጫ ስነዕናዊ የሳ አምስት-ኩጥብ የአይከርት ስነዕና ዓይነው:: 1 = በጥም አልነማማግም (በአ)፣ 2 = አልነማማግም (አ)፣ 3 = መወሰን አልቻልም (መአ)፣ 4 = እነማማግለሁ (አ)፣ 5 = በጥም አልማማግለሁ (አ)

ክፍ	የመረጃ ትኩስ	ቦ.አ	አ	መ.አ	አ	ቦ.አ
II1	አጠቃላይ ከሚሰሩ የልጻችናትኩስ አጋርቶችን የር መቻማን መረጃዎችን እንደዋጠጥለን::	1	2	3	4	5
II2	የከተማና አንቀጽዎችን ለመቀበበር ለቋዕ የአንጻርመሬት ተከተለዋልን እንጂውማለን::	1	2	3	4	5
II3	የከተማና የቅርመን በታ ለማስታወሻ ለቋዕ የአንጻርመሬት ተከተለዋልን እንጂውማለን::	1	2	3	4	5
II4	ከለቃቃቃትኩስ አጋርቶችን የር የለወን አንቀጽዎች ለማስልጥ አንጻርመሬትን የእሌከተርናኩ የታ ለውጭ ተከተለዋልን	1	2	3	4	5



	አንበሳማለን::					
ድርጅታዊ ትኩር						
ክፍ	ጥያቄዎች	በ.አ	አ.	ሙ.አ	አ	በ.አ
OI1	ከኢትዮጵያ የር ከሀውት፣ ስጋት፣ ወጪ እንዲሁም ሽልማችን እንደረሰን::	1	2	3	4	5
OI2	ከኢትዮጵያ የር የሀው ወያዣት ለመኖጠርና ፈጥን የጥና አፈታት በወያዣን ለመቀየስ አብረን የምንሰራዎት ዕቃድ አለን::	1	2	3	4	5
OI3	ወደባችን ከደንበቃዎች የር አብር ይመራል::	1	2	3	4	5
OI4	ወደባችን በጥኑት ለርጓዣ ወሰጥ አብር የመሰራትን ባህል የበረታታል::	1	2	3	4	5
የአንበሳማለት ድጋፍ						
ክፍ	ጥያቄዎች	በ.አ.	አ.	ሙ.አ	አ	በ.አ.
IS1	የጥኑት ማንኛወን በተሰሳ መሰከተ ለመሰራት የሚያጠበው አፈታዊን ለመለያነና ለመተማበር የሚረዳ የጥናት ወመቻችን እናኝነት::	1	2	3	4	5
IS2	ወደባችን አፈፃፀብ መመረት-ልማችን ለመገኘት ከለምናትከና አፈታዊን የጥናት ድጋፍ የሚል::	1	2	3	4	5
IS3	ወደባችን የጥኑት ለርጓዣ ለሰራተኞች ለማቅረብ ለባል እንዲ ተስከርከራና መጠን ያሉ አፈታዊን የሚታደል::	1	2	3	4	5

ከፍል ሆነት:: የወደብ አፈጻጸም መሰከተው መጠይቻች

የወደብ አፈጻጸም በተመለከተ እባክዎን ከሚከተሉት መግለጫዎች የር የሚሰጣቸውንን ወይም
የሚይሰጣቸውንን ደረጃ የሚመከለውን ቅጥር የከበበ::

የጥናው ሰነድዎች ባሉ እምነት-ጥናው የአይከርት ሰነድ ዓይነው:: 1 = በጥናው አፈላማማግኘው
(በ.አ):: 2 = አፈላማማግኘው (አ):: 3 = መውሰን አፈታዊው (ሙ.አ):: 4 = እስማማግለሁ (አ):: 5
= በጥናው እስማማግለሁ (በ.አ)



የኢት-አፈጻጸም						
ክፍ	ጥያቃቄ	0.ከ	ከ	መ.ከ	ለ	0.ከ
OP1	ቀሚያት- ባለው መልከ አስተማማኝ አገልግሎት ስንሰጥ እንዲጠቃለሁ::	1	2	3	4	5
OP2	ከደንበቅታት የሚገኘ ትረታዥ ጥቂት ስታው::	1	2	3	4	5
OP3	መደብቻን የተለያየ መጠናና ይዘት የለታዥን ጥናቃቄ ማስተናገድ ይችላል::	1	2	3	4	5
OP4	ጥናቃቄን ከተመዘገበው ስያት ስናሰሰና እናስተናገድበት::	1	2	3	4	5
OP5	የወደብ እንቅስቃሴ መጠናቻን ተቋጥቶ ነው::	1	2	3	4	5
የወደብ በቋጥት						
ክፍ	ጥያቃቄ	0.ከ	ከ	መ.ከ	ለ	0.ከ
PE1	የወደብቻን ክራን ምርታ-ማኑት ከኋላቸው ነው::	1	2	3	4	5
PE2	በወደብቻን የበትር እና መከና የቋይታ ገዢ አዋጅ ነው::	1	2	3	4	5
PE3	የጥናቃቄ መጠናቻንን ለመጨመር ጥረት እናደርጋለሁ::	1	2	3	4	5



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