

# THE IMPACT OF PORT PERFORMANCE AND TRADE: THE CASE OF SELECTED AFRICAN STATES

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## ABSTRACT

Maritime transport remains the main gateway to the global marketplace. Maritime transportation is the main support of global trade, with its ability to move large quantities of cargo over long distances. For maritime transport to thrive, there must be efficient ports. Ports are one of the primary components of the general transportation sector and are nowadays linked to the expanding world economy. Ports are basically a means of integration into the global economic system. Efficient and well-connected container ports enabled by frequent and regular shipping services are key to minimizing trade costs, including transport costs, linking supply chains and supporting international trade. Thus, port performance is a critical factor that can shape countries' trade competitiveness. However, for Africa, the ports are dilapidated, lack essential infrastructure, are congested and perform poorly. Africa's shipping and ports do not always match global trends and standards. In light of this, this study seeks to assess Africa's current port performance and test the relationship between Africa's port performance and trade competitiveness. The study used panel data that covering the period 2010 to 2018. A system GMM panel technique was used for estimation purposes. Results showed that port performance positively affect trade.

## 1. INTRODUCTION

Ocean ports are a central and necessary component in facilitating trade. According to Ndlendle (2018) trade competitiveness requires governments and key stakeholders to see ports as facilitators of trade and integrators in the logistics supply chain. Over 90% of international trade moves via the sea, making ports and their hinterlands vital for global trade (Sok, 2016; Fugazza & Hofman, 2017; International Maritime Organization, 2018; Jha, 2019). This shows that Maritime transport is at the core of international trade and in order for maritime transport to be efficient, there should be, among other things, well-functioning ports. Ports are a primary conduit of international trade and are central to growth of the global economy. Greater strides should be made to ensure that ports are efficient and their operations are frictionless in order to spur trade.

Efficient ports set the ground for trade and ports can also enhance a country's growth prospects. It can thus be said that port efficiency is important to improving trade facilitation. Thien (2019) and Sebastian (2019) state that every hour of port time saved by ships translates into savings in port infrastructure expenditure for ports, ship capital costs for carriers, and inventory holding outlays for shippers. Efficient and well-connected container ports enabled by frequent and regular shipping services are key to minimizing trade costs, including transport costs, linking supply chains and supporting international trade (Benamara, Hoffmann, Rodriguez & Youssef, 2019). Consequently, port efficiency is a fundamental factor that can determine the trade competitiveness of any country.

Ports are a vital part of the supply chain in Africa, with many ports having a far-reaching hinterland often spanning a number of countries, which makes them a natural focus for regional development (Trade Mark East Africa, 2018; PwC, 2019). Maritime shipping is the lifeblood of Africa, with over 90% of the continent's imports and exports transported by sea (African Union, 2019; Manduku, 2019). Furthermore, Africa is located on one of the busiest global sea routes, vital to global maritime transportation, and its geographical position offers an enormous chance for investing in a diversified global market. Despite the significance of ports to international trade, the development and integration of ports in Africa's wider logistics chains and performance remains poor (Shaw, 2018; Tralac, 2018; Trade Mark East Africa, 2019; Chimbela, 2019). Africa still makes up just a small percentage of global trade, with problems persisting at its ports from performance issues to inefficient handling time, poor security and in some places, corruption (Kingsland, 2020). Africa needs to make the use of the economic potential of its ports and shipping sector if it is to realise its growth ambitions. An analysis by the PwC revealed that a 25% upgrade in port efficiency may increase growth by 2%, demonstrating the close relationship between port effectiveness and trade competitiveness (Booth, 2018; Niselow, 2018). However, with increasing congestion in several African ports<sup>1</sup>, Africa faces the risk of foregoing further growth through poor or little investment in port terminal infrastructure. Access to effective ports, interconnecting infrastructure and efficient operations to cope with current demand and future growth could lead to reduced costs and improved overall freight logistics efficiency and reliability, all of which are fundamental to the region's future success (UNCTAD, 2019). It is against this background that this study engages in an investigation of the impact of port performance on trade. Considering the current state of ports in Africa it is important to embark on a study on how port performance affect trade.

## 2. THE CURRENT STATE OF PORTS IN AFRICA

The section makes an attempt to build a glimpse of port performance in Africa. The key aim is to show the current performance of ports. This is important because it might give an insight of whether African ports are performing efficiently. Port performance is a key indicator of trade efficiency that determines connectivity and trade costs (UNCTAD, 2017). African ports have been seen to be performing badly compared to other regions. Table 1 below shows the highest and lowest ranked economies in terms of median time spent in ports.

Table 1 shows that none of African countries are in the top ten performing countries. Most African countries are in the bottom ten<sup>2</sup>. In other words, several African countries have low ranks when it comes to the median time spent by container ships. This suggests that the median time spent by container ships at ports in Africa is high. Figure 1 gives a much clearer picture of the median time spent by all ships (passenger ships, wet bulk ships, container ships, dry bulk ships etc).

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<sup>1</sup> South Africa's President, Cyril Ramaphosa also echoed a similar sentiment in his 2020 State of the Nation Address. Mr Ramaphosa stated that South Africa's ports were congested and inefficient and this resulted in delays and increased costs of doing international business (Ramaphosa quoted in RSA, 2020).

<sup>2</sup> This is also in line with the 2018 Lloyd list of Top 100 global container ports, from Africa, only four container ports in Morocco, Egypt and South Africa, were listed (Jafferi, 2019).

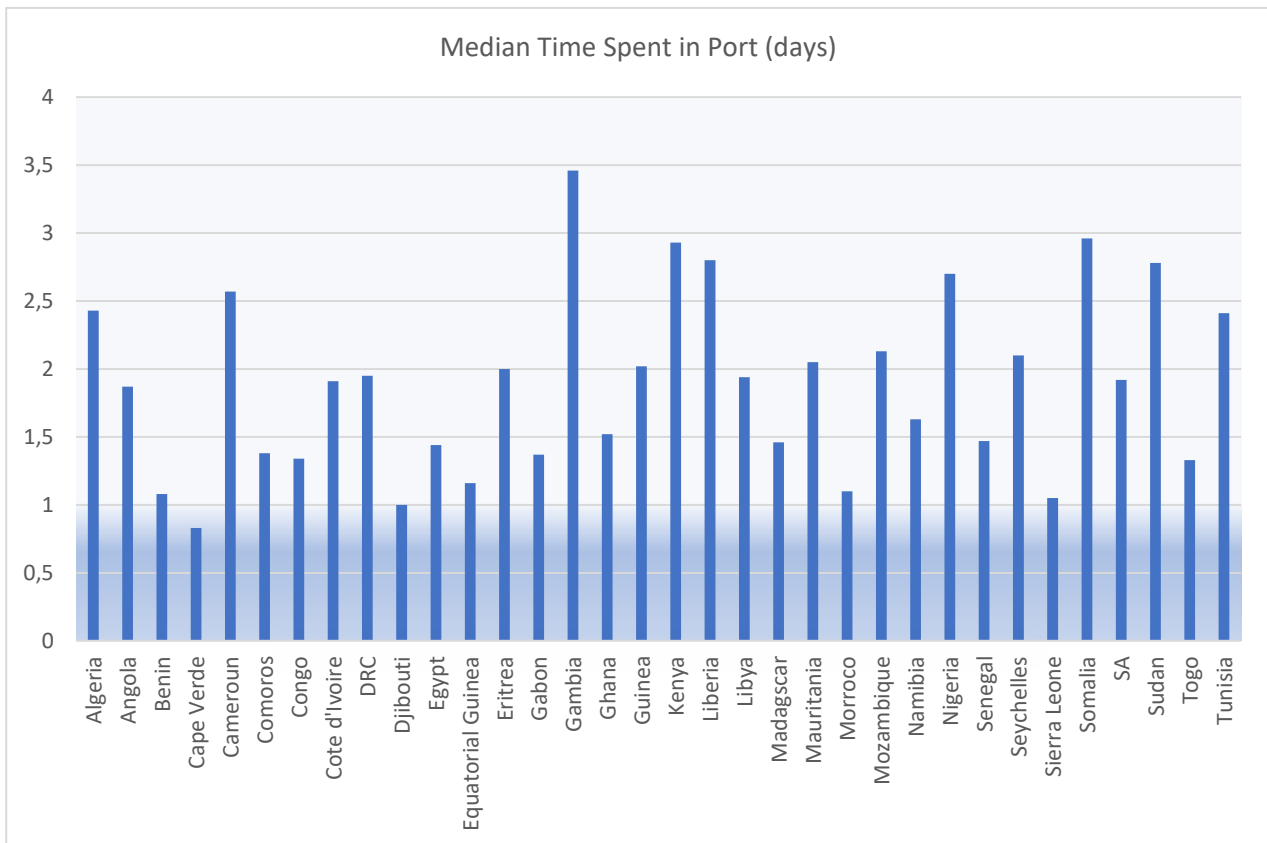
**Table 1: Ten highest- and lowest-ranking economies: Median time spent in port by container ships**

Country	Ranking from fastest to slowest	Median time in port (days)	Total no of ports calls in 2018
Peru	1	0.11	2 521
Switzerland	2	0.23	394
Japan	3	0.31	44 382
Gibraltar	4	0.35	1 252
Germany	5	0.36	14 394
Cyprus	6	0.39	909
Faroe Islands	7	0.45	125
Iceland	8	0.48	242
Netherlands	9	0.49	41 843
Panama	10	0.49	2 713
Madagascar	142	2.77	131
Reunion	143	2.86	33
Senegal	144	2.96	265
Congo	146	2.97	36
Somali	147	3.53	56
Iraq	148	3.80	1 380
Nigeria	149	4.31	1 507
Tanzania	150	6.48	236

Source: UNCTAD (2019)

Figure 1 shows that most only 3 African countries compare to the global average of 0.88 days; Cape Verde (0.83), Djibouti (1), Morocco (1.1) and Sierra Leone (1.05). Most African countries have a median time of at least 2 days. This may suggest that “port performance<sup>3</sup> is generally poor in African countries. A report by PWc (2018), Tralac (2018) and Trade Mark East Africa (2019) also came to a similar conclusion. The Trade Mark East Africa (2019) argues that many of the handling inefficiencies and long container dwell times are a consequence of poor port infrastructure, poor port management, customs and associated container clearing processes, as well as inadequate landside connections which prevent containers leaving ports without delay. Saggia (2017) states that African ports face the primary challenges of under-developed infrastructure, usage of dated equipment and low levels of automation; and container and cargo theft. This makes most African ports “fail to match global industry standards” (Jaferi, 2019).

<sup>3</sup> A shorter time in the port is generally indicative of high port efficiency and trade competitiveness (UNCTAD, 2019)



Source: Author's own computation using UNCTAD data (2019)

NB: The mean time spent in port for the World is 0.88 days. The mean time spent in port for African countries 2 days.

**Figure 1: Median time spent in port**

This poor performance of ports has negative consequences. Saggia (2017) states that inefficient operations, at ports lead to significant losses in potential revenue and “the ports’ inefficiencies have for years enabled corruption from middlemen promising to clear goods for a fee” (Jaferi, 2019). High port logistics costs, poor reliability and low economies of scale in trade volumes have a negative impact on trade growth in Africa (Doe, 2018 and Ramaphosa quoted in RSA, 2020). It should be realised that efficient and well-connected container ports enabled by frequent and regular shipping services are key to minimizing trade costs, including transport costs, linking supply chains and supporting international trade. (Benamara et al., 2019). It should be realised that when more consideration is given to ports through infrastructure investment and port maintenance, ports are likely to contribute positively to trade and economic growth. Well maintained and well function ports are vital for trade and development. Despite such importance, the impacts of port performance on Africa’s trade and economy have been largely overlooked in the existing literature.

### 3. METHODOLOGY

In order to examine the impact of port performance on trade, an econometric analysis was done across 10 African countries (Gambia, Liberia, Nigeria, Kenya, Cameroun, Ghana, Ivory Coast, Senegal, South Africa and Morocco). Data was sourced from the UNCTAD and the World Bank. Panel data covering the period between 2010 and 2018 was used in the study. An econometric technique, Generalized Method of Moments (GMM) was used to estimate the regression. The GMM was chosen because it is capable of sorting out the problem of endogeneity and autocorrelation due to the presence of lagged dependent

variable in the explanatory variable. The study modified Munim and Schramm (2018)<sup>4</sup> and came up with the following model:

$$TR = f(INF, PP, GDP, EXCH, D) \quad (1)$$

Where TR is Trade, INF is inflation, PP is port Performance, GDP is economic growth, EXCH is exchange rate and D<sup>5</sup> is a dummy variable.

The description of the variable presented in equation (1) above is presented in Table 2 below.

**Table 2: Summary of variable description**

Variable	Description and Unit of Measurement	Source
PP	Port Performance. The Port throughput was used to measure port performance. Port throughput measures reflect the amount of cargo or number of vessels the port handles over time.	UNCTAD
TR	Trade. This was measure using the contribution of trade to GDP	World Bank
PP	Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals	World Bank
GDP	Economic Growth. This is the Annual percentage growth rate of GDP at market prices based on constant local currency.	World Bank
EXCH	Real effective Exchange rate. Real effective exchange rate is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs	World Bank

#### 4. PRESENTATION OF RESULTS

A GMM was estimated and the results are shown in Table 3 below.

Results show that there is a statistically significant positive relationship (4.144) between PP (port performance) and trade. This result is consistent with literature. Literature views ports and terminals as key engines for economic growth (Dwarakish and Salim, 2015;

<sup>4</sup> Munim and Schramm (2018) did a study that tested the impacts of port infrastructure and logistics performance on economic growth and showed that port infrastructure contributes to higher seaborne trade.

<sup>5</sup> The dummy variable was used to capture the unevenness of port performance in Africa. The countries included were divided into two categories; best performers and worst performers. Those that were included under the better performing category had a median waiting time of at most 1 day and those under the worst performing category had a median time of at least 2 days. Dummy variable that took a value of one if a country had a median waiting time of at most 1 day, 0 otherwise.

PWc, 2018; Munim & Schramm, 2018). Efficient and well-connected container ports enabled by frequent and regular shipping services are key to minimizing trade costs, including transport costs, linking supply chains and supporting international trade (PWc, 2018). Ports are also important for the support of economic activities in the hinterland since they act as a crucial connection between sea and land transport. The transportation sector is a strong factor in terms of economic and regional balanced development, as well as also having a great influence on national integration to the world economic market (Dwarakish & Salim, 2015). A study by Munim and Schramm (2018) revealed that it is vital for developing countries to continuously improve the quality of port infrastructure as it contributes to better logistics performance, leading to higher seaborne trade, yielding higher economic growth.

**Table 3: GMM results**

<b>Variable</b>	<b>Coefficient</b>	<b>Std Error</b>	<b>t-statistic</b>	<b>Prob</b>
PP	4.144	1.855	2.239	0.0282
INF	5.161	2.365	2.181	0.0323
GDP	5.468	3.553	1.539	0.1280
EXCH	-0.160	0.056	-2.864	0.0054
D	0.528	0.160	3.293	0.0016

Results show that there statistically significant positive relationship (5.161) between INF (inflation) and trade. This may suggest that when inflation is increasing trade tend to increase also. However, other studies that were conducted on the same subject area arrived at different conclusions. For instance Yihevis and Musila (2018) found that inflation exert no significant effect on the trade balance. In another study by Ahmed et al (2018) the outcomes of Granger causality demonstrated the one-way causality from exports to the inflation (CPI), though; there was no evidence of any causal association between imports and inflation.

The study does not find any evidence of a statistical significant relationship between GDP (economic growth) and trade. The result is insignificant as reflected by the p value (0.1280) which is less than 0.05. This shows that there is no relationship between the two variables (GDP and trade). The result is surprising because economic growth is supposed to result in more trade. Countries with higher rates of GDP growth also tend to have higher rates of growth in trade as a share of output (Ospina, 2018). However, other studies have shown that the relationship between growth and trade can be confusing. The relationship between trade and GDP is complicated (World Economic Forum, 2016).

The study shows that when there is a depreciation of the domestic exchange rate, the contribution of trade to GDP declines. This result goes against the traditional exchange rate and exports notion. It is widely expected that the depreciation of exchange rates would improve export performance. The result is consistent with Liew and Mara, (2016) who found that devaluation-based adjustment policies may not achieve the desired effects of nominal exchange rate changes (devaluation) on the balance of trade. In other words, exchange rate cannot be used solely in managing the external balances. Furthermore, a Financial Times (2015) study found that the “benefits of depreciation on exports may have evaporated”. The argument is based on the apparent lack of a correlation between exports and US dollar exchange rates for emerging markets since 2013.

The dummy variable is significant and this reinforces the result that port performance has a positive relationship with trade. Port performance is a critical factor that can shape countries' trade competitiveness. Every hour of port time saved by ships translates into savings in port infrastructure expenditure for ports, ship capital costs for carriers, and inventory holding outlays for shippers (PWC, 2018). This will then contribute positively to trade.

## **5. CONCLUSIONS AND RECOMMENDATIONS**

The main aim of this study was to examine the impact of port performance on trade in Africa. The study drew from the fact that, globally, ports are gateways for over 70% of merchandise trade by volume and value. Efficient ports set the ground for trade and ports can also enhance a country's growth prospects. It can thus be said that port efficiency is important to improving trade facilitation. However, in Africa, the functioning and concatenation of ports in Africa's wider transport logistics chains remains poor. Others fall behind in terms of available facilities, dependability and effectiveness in the handling of freight, which increase supply-chain costs. The inconsistencies in port performance affects Africa's transport logistic chains, and makes African countries less efficient than they should be. Africa still makes up just a small percentage of global trade, with problems continuing at its ports from capability issues to inefficient handling time, poor security and in some places, corruption.

The results from the study showed that port performance has a positive impact on trade in Africa. This study argues that the success of Africa's ports and transport logistic chains is critical to Africa's transformation of economic potential to growth. The transportation system is a vital factor in terms of economic growth as well as also having a major influence on Africa's integration to the global market. This has not been acknowledged by several governments; they have failed to recognise ports as vital facilitators of international trade. Africa must change its understanding of the part ports can play. Based on the findings, the study recommends that African governments must invest heavily in port infrastructure. This study argues that African ports require infrastructure to be able to compete successfully. Infrastructure investment should also extend to new technologies and innovations of information and communications technology. These are important because they can enhance the efficiency of the supply chain process. Africa need to pursue an intensive course of infrastructure development and proper port governance in order to maintain economic growth, improve port efficiency and trade competitiveness. At the moment, African ports are inefficient and there is congestion partly because the ports cannot accommodate further expansion without serious investments. Investment in infrastructure will ensure that accommodate vessel arrivals/departures and for safe and efficient loading/unloading.

It should also be noted that Africa must not only invest in port infrastructure but also on shoreside infrastructure and intermodal connections that serve ports. In other words, consideration should also be given to highway or rail infrastructure that develops or extends intermodal connectivity and intermodal facilities. This will ensure that access to efficient transport modes of sufficient capacity. Congested transport corridors place an additional burden on ports which might make goods to and ways from ports slowly. Investment in Africa's port infrastructure and the intermodal connections that serve seaports foster prosperity and provide an opportunity to bolster Africa's trade.

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