TRADE LOGISTICS, SUPPLY CHAIN AND TRADE DEVELOPMENT IN NIGERIA.

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Abstract

This study explores the view of professionals on the state of trade logistics (road and ports) in Nigeria. Also, the impact of trade logistics and supply chain on trade development in Nigeria was explored using structured questionnaire. The study is cross-sectional descriptive study that administered questionnaires to fifty professionals that cuts across farmers, Ministry of Transportation, Infrastructure and Rural Development and Port Authorities. Pre-tested questionnaires were used to collect data from the respondents. Four points Likert scale was used to extract data on the impact of trade logistics on trade development. The data was analysed using Statistical Packages for Social Sciences. Frequency and proportion were used in the analyses of the data. Most of the factors used to capture port logistics were rated bad, and none was rated good by respondents. Also, majority of the factors use to indicate road quality were rated poor. For most of the questions use to examine the impact of infrastructure on supply chain, the majority were accepted, meaning that respondents concurred that poor state of infrastructure can negatively affect supply chain. Furthermore, for most of the questions that were used to examine the impacts of supply chain and logistics on trade development, the majority of the respondents agreed that logistics influence trade development in Nigeria. Among other things, it is recommended that Nigerian government should prioritise infrastructural development in its annual budgets and leverage on Public-Private Partnerships (PPPs) in mobilising funds and technical expertise to improve the state of trade logistics.

Keywords: Infrastructure, Logistics, Supply Chain, Trade, Development

Introduction

The influence of trade logistics on trade performance has been the subject matter of several studies (Ozekhome, 2020; Akande & Lawanson, 2021; Ozekhome & Oaikhenan, 2022). Trade logistics have played immense roles in facilitating trade globally (Obadan, 2018). The trade logistic sector has morphed into a vibrant and dynamic sector globally (Nigerian Logistics Sector, 2021). Gani (2007) defined trade logistics as a combination of the procedures involved in the movement of goods from one place to another. An effective trade logistic sector simplifies import procedures, encourages higher export, optimizes supply chain processes, and reduces trade costs (Salawu & Ghadiri, 2022).

Furthermore, countries with higher trade volumes are those with improved trade logistics (Bugarcic et al., 2020). It is reported that a vibrant trade logistics sector can easily transit a developing economies to a highly industrialised one (Salawu & Ghadiri, 2022). Following the formation of the General Agreement on Trade and Tariffs (GATT), there was widespread liberalisation of trade and dismantling of trade barriers globally (Nords et al., 2014). Trade liberalisation engenders severe trade competition, and only countries with robust trade logistics sectors can favourably compete (Rodriguez,

2018). Trade logistics play a great role in facilitating trade, and when they are in a poor state, they could hinder trade growth, and as a result of this, they have been concluded to be non-tariff barriers.

Efficient trade logistics with an efficient railway system, airlines, and a strong road network are drivers of global trade (Zaninovic et al., 2021). Several empirical studies show that trade logistics inspire higher trade volumes (Puertas & Garcia, 2014a; Eriamiatoe, 2022; Ozekhome & Oaikhenan, 2022). However, evidence on the logistics-trade nexus is still evolving, showing the relevance of the subject matter. Though, a handful of studies for the African region examined the effects of trade logistics on trade in the African region without any of the studies specifically covering Nigeria. Past studies only incorporated Nigeria as one of the cross-sectional units; hence, the results were not exclusively for Nigeria.

Statement of the Research Problem

It will be pertinent to increase the size and effectiveness of support networks, more especially logistic services so that international trade will continue to grow and for several economies to become willing to speed up their participation into the global trading system. Poor logistic services including inadequate cross-border management, ineffective custom procedures at ports, poor transportation infrastructures, high costs of shipping (through long, indirect route options); delays in the tracking and tracing of shipments; inadequacies in terminal dealings and clearance of goods, poor storage facilities at ports and challenges in certifying product quality are some of the barriers to global trade (Salawu & Ghadiri, 2021).

In Nigeria, trade logistic sector and the state of infrastructure has been in a parlous state, reflecting poor performance. For instance, LPI is ranked low in Nigeria (World Bank, 2023). The World Bank's (2023) LPI ranked Nigeria 88 out of the 139 countries assessed (World Bank, 2023). Nigerians also rank low considering the various dimensions of the LPI. For instance, the custom score was 2.4, and this falls below average and indicates several impediments to clearing and forwarding in Nigeria. Also, the clearing and forwarding procedure is slow and cumbersome with uncertainties of formalities by boarder control agencies. The international shipment score is 2.5, which is below-average score and it implies bureaucratic or regulatory barriers, high costs of shipping goods, and poor access to shipping services (World Bank, 2023).

The Nigerian economy is relatively open considering the degree of trade openness measured as export receipt as a share of the GDP (Obadan, 2018). The trade openness stood at 57.8% in 2021 (World Bank, 2023). The degree of trade openness in Nigeria was higher than the global average of 58.2% in 2021 (World Bank, 2023). With this high level of trade openness, Nigeria is expected to be a key global player in trade of which the results showed the contrary (Obadan, 2018). Trade logistics is considered among the factors hindering trade development in Nigeria (Eriamiatoe, 2022). The poor state of trade logistics in Nigeria is further confirmed by The World Bank's (2023) recent ranking which puts Nigeria at the 88th position out of 139 countries using LPI bears testament to the poor state of trade logistics.

Despite the benefits of trade logistics in supporting commercial activity, there is scanty evidence to that in Nigeria. Drawing from the literature, there is a dearth of evidence on the role of trade logistics and supply chain on trade development in Nigeria.

Only a handful of Nigerian studies have examined the influence of trade logistics on trade performance (see Ozekhome, 2020; Ozekhome & Oaikhenan, 2020; Eriamiatoe, 2022). However, the majority of the studies used secondary data where trade logistic measures were regressed against external trade earnings. Hence, there is a dearth of evidence on studies that used primary data method to explore the influence of trade logistics on trade development in Nigeria, especially focusing on its effects on supply chain.

Literature Review
Concepts of Trade Logistic

Sharipbekova and Rainbow (2018) define logistics as the management and control of information, resources and items among locations, especially the movement from production units to selling points. In the views of Sevgi and Tezcan (2017), the World Bank estimated the logistic performance index (LPI), which is the benchmark used to assess a country's logistic performance. The LPI incorporates six measures,, including customs, tracing and tracking, infrastructure quality, timeliness, logistic service quality and the ease of doing business (Obayelu et al., 2020).

Transportation is one of the most valuable aspects of trade logistics (Munim and Schramn, 2018). Different aspects of transportation aid logistics and trade,, including seaports,, road transportation and air transportation. There have been significant improvements in transport logistics,, including high-speed vehicles, cool storage warehouses, warehouse robotics and the use of drones **(**Obayelu et al., 2020). Wilson et al (2003) reported that setbacks in trade logistics will result in high costs of trade in the same manner that long distance raises trade costs. Robust trade logistics increase accessibility, trade reliability and trade cost-effectiveness. Consistent improvement in trade logistics enhances supply chain resilience and logistics ecosystem competitiveness (Obadan, 2018). Building effective logistic service requires adequate funding, collaboration between the government and the private sector and effective public institutions. Selawu and Ghadiri(2021) reported that trade logistics is a pillar to economic progress because it facilitates trade and enhances business competitiveness.

There are deeply rooted inefficiencies in the Nigerian logistic sector, and this has hindered the country from achieving trade competitiveness (Nigerian Logistic Sector, 2021; Selawu & Ghadiri, 2021). Nigerian studies examined the effects of trade logistics on trade facilitation and costs and and revealed that poor state of trade logistics negatively affects trade competitiveness (Ozekhome, 2020). For instance, using General Methods of Moments (GMM) to analyse data for 15 ECOWAS countries,Ozekhome et al. (2021) revealed that robust trade logistics positively influence trade volume and transactions among ECOWAS.

The Nigerian logistic sector has consistently lagged behind and operated below the optimal performance level due to infrastructural deficits, poor policy implementation, an unreliable power supply, pervasive corruption and the incidence of multiple taxes (Nigerian Logistic Sector, 2021). As a result, producers transfer their high costs of production caused by high transportation costs to the final consumers. The high costs of production have rendered made-in-Nigeria products cost ineffective, and the incompetent state of logistics has hindered Nigeria from progressing globally in respect of trade. Consequently, Nigeria has

consistently experienced deficit in its trade balance.

Theoretical Literature
Gravity Model Theory of Trade

The Gravity theory of trade is relevant in explaining the role of trade logistics in fostering trade development. The theory is espoused by Tingergen (1962) in his seminar work. The gravity equation helps to explain bilateral trade flows between any two countries (Obadan, 2018). The theory aligns with the Newtonian theory of gravitation, which proposes that as planets are mutually attracted in proportion to their sizes and proximity, the volume of trade between any two countries is significantly influenced by the economic mass (proxy by the Gross Domestic Product) and the distance between them. Initially, the gravity equation was seen as a representation of the stable connection between economic masses, the distance between countries and volumes of trade. The unusual stability of the gravity model and its benefits in explaining bilateral trade flows inspired the search for a better theoretical explanation(Akande & Lawanson, 2019).

The theory proposes that greater trade volumes exist between countries that have disparity in economic masses (Obadan, 2018). In other words, countries that have disparity in their sizes tend to engage in more trade transactions. On the other hand, distance discourages trade relationships between countries. Hence, better trade relationships exist between countries that are contiguous or those living in proximity. In summary, trade flows between any two countries seem to be positively associated with disparity in economic sizes and negatively associated with distance (Iyoha, 2006).

Several studies have been conducted using the Gravity Model Theory of trade with diverse degrees of empirical success. For instance, McCallum (1995) estimated a trade model for selected states in the USA and provinces in Canada using two primary variables (distance between regions and a dummy used to capture whether the two states are located in the same region). After controlling for distance and sizes, the study found out that greater trade transactions existed between provinces than between states and provinces, which revealed trade cost barriers at the USA-Canada border.

Empirical Literature Review

Trade deregulation and reduction in tariffs inspired research in examining the impact of both tariff and non-tariff barriers on trade growth performance. The effects of trade logistics on trade performance have occupied a notable place in the literature (see Gani, 2017; Soloaga et al., 2016; Ozekhome, 2020). The consistent report is that improving the state of trade logistics will facilitate trade growth both in-country and among countries.

Evidence from Nigeria

This section explored the effect of trade logistics on supply chain and trade development using Nigeria as a case study. Ozekhome (2020) used data for the period 2006-2019 collected from six countries in the West African Monetary Zone (WAMZ) to explore the effects of trade logistics on trade volumes. The study utilised the system-General Methods of Moments (S-GMM) in analysing the data. According to the results from the estimated model, increasing trade costs as a result of the weak state of trade logistics will exert a negative effect on trade transactions and volumes among the countries. Also, devaluing the country's currency and achieving robust economic growth and financial sector development increase trade flows among the countries.

According to the study, easing the costs of doing business and improving trade logistics will improve trade volume flows in the region. The method use for the analyses is robust and it addressed issues associated with misspecifications, errors of measurements, errors of omissions and captures dynamic behaviours in econometric relationship. Despite these strengths, there are several shortcomings with the S-GMM. First, there are possibilities to generate a large number of instruments, more especially with time periods. Too large a number of instruments can over fit endogenous variables and weaken the Hansen/Sagan test, thereby resulting in invalid inferences. Second, there can be faulty assumptions that the idiosyncratic errors are not serially correlated. If this is not true, it may be hard to interpret the results and communicate the findings to non-technical audience.

Ozekhome and Oaikhenan (2021) examined the role of trade logistics in fostering trade participation among 15 countries in the ECOWAS region. Panel data for the period 2010-2020 obtained from the World Bank World Development Indicators (WDI) was used for the analyses. The data was analysed using General Methods of Moments (GMMs). From the estimated model, trade logistics has a weak relationship with trade flows in the ECOWAS region. Furthermore, foreign direct investment inflows, depreciated currency, macroeconomic policy instruments and various variables representing institutional quality improve better trade relationships in the region. The study recommends that, among other things, countries in the region should improve trade infrastructures and upgrade logistics measures such as roads, rails and seaports.This study used the traditional panel estimation technique, which has several shortcomings. The first short

coming is the assumption that the relationship between variables is the same across cross-sectional units. This can lead to misleading results where heterogeneity (i.e., individual-specific behaviour) is significant (Gujarati & Porter, 2009). Also, traditional panel models do not adequately capture dynamic behaviours, e.g., past values influencing current value. Consequently, essential lagged effects or time-series patterns may be ignored. Furthermore, the model assumes that the regression are exogenous which may not be true in practice hence undermining endogeneity may result in biased and inconsistent estimates (Gujarati & Porter, 2019). The traditional panel estimation method did not consider omitted variables, models that are misspecified and errors of measurement (Ahuru et al., 2021).

Furthermore, Eriamiatoe (2021) examined the effects of trade logistics on the volumes of trade among ten countries in sub-Saharan Africa (SSA). Trade was broken down into export and import. Panel data for the period 2012-2020 was used for analyses. Several controlled variables were incorporated, including exchange rates, portfolio investment, gross fixed capital formation as a share of Gross Domestic Product (investment rate) and policy stability. Three models were estimated for each of the two trade variables, and they were the Pooled Ordinary Least Square, the Fixed Effect and the Random Effect models. The study found out that better trade logistics significantly impacted export volumes but has no significant impact on import volumes. The study recommends that better investments should be made to upgrade trade logistics in SSA. Like Ozekhome and Oaikhenan (2021), the study by Eriamiatoe (2021)had several limitations. Key among the shortcomings is the fact that the method used could not address omitted variables,

errors of measurements and assumptions of exogeneity of the regressors. Furthermore, the model assumes that the error term is neither serially correlated nor present with homoscedasticity. If there is a possibility that these assumptions were violated, this can result in inefficient and biased estimates and these were not addressed by the methods used (Gujarati & Porter, 2009; Oriakhi& Ahuru, 2014).

Finally, Salawu and Ghadiri (2022) used structured questionnaire to elicit information from 353 persons working in port authority with the intent to examine if the state of port logistics influence trade development In Nigeria. Using the Structural Equation Model (SEM), the study found out that trade logistics significantly influence trade development in Nigeria. However, the use of structured questionnaire limited the extent to which the subjective experiences of the respondents were reported. Also, narrowing the study down to port logistics will obscure other aspects such as roads logistics.

From the review of the literature, it can be seen that only a handful of studies in Nigeria examined the effects of trade logistics on trade development (see Ozehome, 2020; Ozekhome & Oaikhenan, 2021; Eriamiatoe, 2021; Salawu & Ghadiri, 2022) . However, these studies used aggregate demand and due to the nature of the data, particularly limitations in measuring certain aspects of supply chain. As a result, the effects of trade logistics on supply chain could not be fully uncovered. Though Salawu and Ghadiri (2022) used primary data but the aspects of logistics covered was only port logistics leaving rooms for other aspects to be addressed. In the light

of the system theory, this present considered it worthwhile to examine the interdependence of trade logistics, supply chain and trade development. To improve on existing studies, this study used primary data collection method and examined professionals from diverse fields who were experienced on the state of trade logistics in Nigeria, and how they can possibly influence trade development.

Research Design and Methods
Research Design
The study design is cross-sectional descriptive study. The study approach is quantitative in nature. Cross-sectional data were collected using questionnaire and were analysed using descriptive. Questionnaires were administered to professionals who are versed in their knowledge of trade logistics and how it can impact on trade development.

Population of the Study
Population is the sum total of the numbers of people or items that make up a group (Saunders et al., 2015). The population in this study is the total number of registered farmers, professionals working in the Ministry of Transportation, Infrastructures and Rural Development and those in Nigerian Ports Authorities (NPA). Professionals in this field were selected because they have experience on trade logistics and infrastructures and how they can impact on trade development. Through their job experiences, they gained wide knowledge on the subject matter and they are in a best position to report the issues. In Table 1, the registered numbers of professionals in the three professions is presented.

Table 1: The number of professionals across the three groups.

Names of group	Number of registered persons
Farmers,	50

Ministry of Transportation, Infrastructures and Rural Development	37
Nigerian Ports Authorities.	27

The total number of professionals is 114, and this is the population of the study from where sample was drawn from.

Sample Size Determination

The estimated sample size is 88, and the Yamane's (1967) sample size is used in working out the sample size. The sample size formulae is applied based on the following assumptions; the population is finite and the error margin is 5% giving rise to a standard critical value of 1.96. Based on the assumption, the sample size is estimated:

N = $\frac{N}{1+Ne^2}$

Where,
n= Sample size
N= population size (114)
e= error margin = 0.05

n = $\frac{114}{1+114(0.05)^2}$

n = $\frac{114}{1+114(0.025)}$

n= $\frac{114}{1+0.285}$

n= 88

Sampling

The estimated sample size is 88, and this was distributed across the three groups of professionals. To avoid sampling bias, the proportional sampling method was used to apportion the size sample across the three professional groups. This will help prevent sampling bias and guarantee adequate representation. The formulae to apply this is presented as:

n= $\frac{number\ of\ professionals\ in\ a\ particular\ group}{total\ number\ of\ professionals\ in\ the\ three\ groups}$ * *worked out sample size.*

Names of group	Number of registered persons	Number represented in sample (n= 88)
Farmers,	50	$\frac{50}{114}$*88 = 38
Ministry of Transportation, Infrastructures and Rural Development	37	$\frac{37}{114}$*88= 29
Ports Authorities.	27	$\frac{27}{114}$*88= 21

Table 2: Number of professionals selected in the three group.

Questionnaire and its Administration

Questionnaires were administered to staff of professionals from the three field, and the inclusion criteria were being from one of those professions, giving voluntary consents and being available at the time of administration. A sample size of 88 was worked out using Yamane's (1967) sample size formula.The questionnaires has four (4) sections. Section A focuses on demographic characteristics of the respondents. Section B focuses on state of port logistics and supply chain. Section C focuses on road logistics and supply chain elements, and section D examines the views of professionals on the impact of trade logistics on trade performance using the four-points Likert scales (strongly agreed, agreed, disagreed and disagreed). The questionnaire was administered using google form hoisted online. The link to the questionnaire was copied to the respondents through online and What App. Responses were hoisted online and downloaded on excel-sheet.

Validity of the Research Instrument

To ensure the content validity of the questionnaire, a pre-test was carried out among five academics and six industrial experts in the field of supply chain and logistics. Request was placed on them to evaluate the clarity of the wording and suitability of the items in each scale. Based on their feedback, the wording of some questions and instructions were modified. To guarantee reliability of data, we conducted a pilot study with 10 officials of the Nigerian Ministry of Trade and Commerce. Each of the participants was asked to complete the questionnaire, evaluate it and make comments on clarity and understanding (Hou, 2019). The Alpha Cronbach coefficient was used to measure the internal consistency of each of the construct in the study. The value of the Alpha Cronbach for each construct was greater than 0.7, this indicates satisfactory level of reliability levels which is above the recommended level of 0.6 (Hou, 2019). Drawing from the feedback received, further modification on the wordings of the questionnaires and instructions were made. The 10 officials used for the pretests were not included in the sampling frame of the study.

Statistical Analyses

The collected data were analysed using Statistical Packages for Social Sciences (SPSS version 20.0). The characteristics of the respondents were presented using simple and proportion. For section B and C focusing on ports and roads logistics and supply chain, descriptive statistics such as mean, standard deviation, Skewness and Kurtosis were used. For further analyses of section B and C, simple proportion and frequency were used for the analyses. For section D which used the four-points Likert scales, the mean decision score was estimated and compared against the mean score for each item. The items whose mean score is higher than the decision mean score were accepted as significant and valid, while others were considered as non- significant.

Results

This chapter presents the data collected from field and its analyses. It provides results for testing the hypotheses in the study. Also, the results were discussed in this chapter.

Summary Statistics

In Table 3, the demographic characteristics of the respondents were presented. A total of 88 questionnaires were distributed, but only 50 were returned, with a response rate of 56.8%.

Table 3: Social Demographic Characteristics of the Respondents

Demographic Factors:	Frequency (N= 50)	Percent (%)
Gender:		
Male	32	64.0
Female	18	36.0
Age (in years):		
18-20	04	8.0
21-30	22	44.0
31-40	24	48.0
Education Attainments:		
OND	5	10.0
Degree	29	58.0
Msc	11	22.0
Phd	5	10.0

In Table 3, the demographic statistics of the respondents are presented. Male gender constitutes 64%, while female constitutes 36.0%. Concerning age, the majority of the respondents fell within the age group (21-30) (48.0%), next is (21-30) (44.0%) and the least age bracket is (18-20)years (8.0%). Analyses of education attainment showed that the majority of the participants had only first Degree (58.0%), next MSc (22.0%), OND (5.0%) and PhD (5.0%).

4.3 Examining the state of Port Logistics
In Table 4, the views of professionals on the state of port logistics are presented.

Table 4 : Professionals' view on the state of port logistics (15 respondents)

Elements	Very Bad	Bad	Moderate	Good	Very Good
Road transport vehicles	2 (13.3)	5 (33.3)	3 (20.0)	4(26.7)	1 (6.7)
Road haulage charges	2 (13.3)	3(20.0)	5(33.3)	4 (26.7)	2 (13.3)
Time of transition	2 (13.3)	3(20.0)	6 (40.0)	3(20.0)	1 (6.7)
Reliability of service	3 (20.0)	2 (13.3)	6 (40.0)	3 (20.0)	1 (6.7)
Access to port	1(6.7)	3 (20.0)	6 (40.0)	3 (20.0)	2 (13.3)
Port-hinter land road network	3 (20.0)	2 (13.3)	7(46.7)	2 (13.3)	1 (6.7)
Warehouse availability	2 (13.3)	3 (20.0)	5 (33.3)	4 (26.7)	1 (6.7)
Documentation process	3(20.0)	2 (13.3)	5 (33.3)	4 (26.7)	1(6.7)
Cargo safety	3 (20.0)	2 (13.3)	6 (40.0)	3 (20.0)	1 (6.7)
Port tariffs	3 (20.0)	2 (13.3)	6 (40.0)	3 (20.0)	1 (6.7)
Tracking facilities	2(13.3)	2(13.3)	6(40.0)	4(26.7)	1 (6.7)
The procedures for clearance in ports	2 (13.3)	1(13.3)	7(46.7)	3 (20.0)	1 (6.7)
Packaging systems in ports	2 (13.3)	2(13.3)	6 (40.0)	3 (20.0)	1 (6.7)
Material handlings	2 (13.3)	3(13.3)	5(33.3)	4 (26.7)	1(6.7)
Invetory management systems	2 (13.3)	7(46.7)	1(6.7)	4 (26.7)	1 (6.7)
Adherence to ship arrival	1 (6.7)	8(53.3)	2 (13.3)	2(13.3)	1(6.7)
Adherence to ship departure	2(13.3)	7(46.7)	1(6.7)	3 (20.0)	2 (13.3)

Industrial harmony	2(13.3)	6(40.0)	2 (13.3)	3 (20.0)	2 (13.3)
Custom charges	2(13.3)	5(33.3)	3(20.0)	4 (26.7)	1 (6.7)

Note: percent in parenthesis.

Table 4 showed that road haulages charges (20.0%), transition time (40.0%), reliability of service (40.0%), access to ports (40.0%), power-hinter land road networks (46.7%), warehouse availability (33.3%), documentation process (33.3%), cargo safety (40.0%), tracking facilities (40.%), the procedures for clearance in ports (40.0%), packaging systems in ports (40.0%) and material handling were rated moderate by the respondents. Also, inventory management systems (46.7%), adherence to ship arrival (53.3%), road transport vehicles (33.7%), adherence to ship departure (46.7%), industrial harmony (40.0%) and custom charges (33.3%) were rated bad by the respondents. None of the factors was rated good by the respondents.

4.4 Examining the state of Road Logistics

In Table 5, the views of professionals on the state of road logistics are presented.

Table 5 : Professionals' view on the state of road logistics (14 respondents)

Elements	Very Bad	Bad	Moderate	Good	Very Good
Pave Road Conditions in Nigeria	1 (7.1)	5 (35.7)	8 (57.1)	-	-
Alternatives routes are adequate	-	5 (35.7)	6 (42.9)	2(14.3)	1(7.1)
The Road geometry.	-	4(28.6)	7(50.0)	2(14.3)	1(7.1)
Urban access and last-mile roads.	-	4(28.6)	5 (35.7)	4 (28.6)	1(7.1)
Weight and axle limits	-	5(35.7)	4 (28.6)	-	1(7.1)
Transit times	-	4(28.6)	4(28.6)		2(14.3)
Unexpected delays (accidents, checkpoints, closures).	1 (7.1)	3 (2.1)	5(35.7)	4 (28.6)	1(7.1)
Rate of congestion	-	4 (28.6)	3 (2.1)	6(42.9)	1(7.1)
Road maintenance in Nigeria	-	7(50.0)	4 (28.6)	1(7.1)	2(14.3)
Road Logistics Costs.	-	7(50.0)	4 (28.6)	1 (7.1)	2 (14.3)
Tolls/Fees in roads.	-	4 (28.6)	5 (35.7)	4 (28.6)	1(7.1)
Fuel Price volatility	-	6 (42.9)	3 (2.1)	4 (28.6)	1(7.1)
Inspections on the Road.	-	3(2.1)	6 (42.9)	4 (28.6)	1 (7.1)
Cargo theft risk	-	3 (2.1)	8 (57.1)	3 (2.1)	-
Insurance processes.		4(28.6)	4 (28.6)	5 (35.7)	1(7.1)
Availability of specialised equipment (reefers, hazmat and flatbeds)	-	6 (42.9)	3 (2.1)	4(28.6)	1(7.1)
Disruption of weather events.	-	6(42.9)	3 (21,4)	4(28.6)	1(7.1)

Detours and contingencies in Roads	-	5 (35.7)	4 (28.6)	4(28.6)	1(7.1)

Note: percent in parenthesis.

Table 5, pave road conditions (57.1%), alternative routes are adequate (42.9%), road geometry (50.0%), urban access and last mile roads (35.7%), unexpected delays (35.7%), transit times (28.6%), Tolls/fees in roads (35.7%), inspections on the road (42.9%) and cargo theft risk (57.1%) were rated moderate by respondents. Furthermore, weight and axle limits (35.7%), road maintenance (50%), road logistics costs (50.0%), fuel price volatility (42.9%) and availability of specialised equipment (42.9%) were rated bad. Finally, none of the factors was rated good by respondents.

Impact of Infrastructural bottlenecks on supply Chain.

To test this hypotheses, six questions were asked to professionals using four points Likert scales (strongly agree, agree, disagree and strongly disagree). The six questions find out if various aspects of infrastructural bottlenecks impact on supply chains. The decision mean score was estimated by dividing the scores [strongly agree (4)+ agree (3)+ disagree (2)+ strongly disagree (1) = 10] by the number of responses (4). The decision mean hence is 10 divided by 4, which is 2.5 (See Morah and Nwafor, 2024). The decision is based on comparing the decision mean score with the mean score of each of the six item. The mean score for each of the item is estimated by dividing the total score by the number of respondents. The total score for each item is the sum of the products of the number of person who choose a particular response and the score assign to that particular response (see Morah and Nwafor,2024).

Table 6: The Impact of Infrastructural bottlenecks on supply chain disruptions (50 respondents)

Statements	Strongly agree	Agree	Disagree	Strongly Disagree	Total Score	Mean Score X	Remarks (Reject= R and Accept =A)
Insufficient road quality causes consistent delivery delays for products shipments	10	24	12	4	140	2.88	A
Port congestion occasionally increases the lead times.	11	25	11	3	144	2.90	A
Power outages disrupt production plans.	11	26	9	4	153	3.11	A
Limited warehouse capacity compel unplanned	8	27	11	4	139	2.80	A

reschedules							
Unreliable internet connectivity disrupt processing of order and tracking	10	26	9	5	141	2.82	A
Customs/Inspection procedures engenders unpredicatble clearance procedures.	12	27	8	3	148	2.92	A

Strongly agree = 4; Agree = 3; disagree =2 and strongly disagree = 1.

The responses for the effects of infrastructural bottlenecks on supply chain are presented in Table 6. The responses were extracted from 50 professionals. For item no.1, *which reads that poor road quality causes consistent delivery delays for product shipments. The* mean score for this item is 2.88 and this is higher than the decision mean score of 2.5. This shows that the participants approved the statement. In other words, the participants agreed that poor quality of road can delay shipments of products.

For item no. 2, the statement reads *poor congestion occasionally increases the lead times*. The mean score is 2.90, which is higher than the decision mean score of 2.5. This shows that the majority of the respondents agreed that poor congestion increases the lead times. The respondents concurred that the majority of the respondents agreed that port congestion will negatively affect supply lead times.

For item no.3, the statement reads *power outages disrupt production plans*, the mean score of the item is 3.11, which is above the decision mean score of 2.5. This

shows that power outages disrupt production schedules by creating delays. Where there are frequent power outages, productions may lag behind in meeting production schedules.

Item no.4, the statement reads, *Limited warehouse capacity compel unplanned reschedules.* The mean score of this item is 2.8 which is higher than the decision mean score of 2.5, showing that the majority of the respondents agreed that limited warehouse capacity compel unplanned production schedules. The respondents agreed that limited warehouse capacity will compel producers to change their production schedules.

Item no.5, the statement reads *unreliable internet connectivity disrupts processing of order and tracking*. The mean score is 2.8 and it is higher than the decision mean score of 2.5. This shows that the majority of the respondents agreed that unreliable internet connectivity will affects ability to quality process order and tracking creating delays and missed opportunities for business.

Item No. 6, the statements reads *custom/inspection procedures engenders unpredictable clearance procedures*. The mean score is 2.92 which is higher than the decision mean score of 2.5. This shows that majority of the respondents agreed that customs/inspection procedures generates unpredictable clearance procedures in ports. The respondents unanimously agreed that customs/inspection procedures create unpredictable clearance procedures.

Impact of Supply Chain and Trade Logistics on Trade Development

To examine the supply chain and trade logistics on trade development eleven questions were asked to professionals using four points Likert scales (strongly agree, agree, disagree and strongly disagree). Similar approach was followed as reported in Morah and Nwafor,2024.

Table 7: The Impact of Supply chain and trade logistics on Trade Development in Nigeria (50 respondents)

Statements	Strongly agree	Agree	Disagree	Strongly Disagree	Total Score	Mean Score X	Remarks (Reject= R and Accept =A)
Transport infrastructures (Roads, ports, rails etc) strongly impact on the efficiency of trade in Nigeria	18	17	9	6	147	2.94	A
An efficient supply chain enables business to reach more global markets.	19	15	8	8	145	2.90	A
The state of warehousing, inventory management and packaging hinder trade development in Nigeria.	15	20	9	6	150	3.00	A
Efficient supply chains reduce the costs of trade and make exports of products more competitive.	20	16	9	5	176	3.52	A

The state of digitalisation such as tracking systems, e-documents and trade platforms has negatively affected trade development in Nigeria.	16	21	9	4	149	2.98	A
Weak logistics infrastructure hinders the growth of trade.	16	22	7	5	149	2.98	A
Delays in supply chain negatively impacts on a country's trade growth	15	24	7	4	150	3.00	A
Reliable supply chain encourages the exportation of high-valued and perishable products.	17	19	10	3	148	2.96	A
Supply chain efficiency encourages the growth of export-oriented sectors.	11	23	11	5	140	2.80	A
Poor state of supply chain raises the risk of trade instability in the course of crises.	16	19	8	7	144	2.88	A
Efficient supply chain aids the maintenance of trade flows during global disruptions (e.g., pandemics, conflicts)	11	26	8	5	143	2.86	A

Strongly agree = 4; Agree = 3; disagree =2 and strongly disagree = 1.

In Table 7, the responses of professionals on the impact of supply chain and trade logistics on trade development. The responses were extracted from 50 professionals.

Item no. 1, the statement reads *transport infrastructures strongly impact on*

the efficiency of trade in Nigeria. The mean score for this item is 2.94, which is higher than the decision mean score of 2.5. This shows that the majority of the respondents concurred that transport infrastructures strongly impact on trade efficiency in Nigeria. Efficient transport infrastructure will facilitate trade.

Item no.2, the statement reads on *efficient supply chain enables businesses to reach more global markets*. The mean score for this item is 2.90 which is higher than the decision mean score. This shows that the majority of the participants concurred that efficient supply chain system help countries penetrate into several global markets.

Item no.3, the statement reads *poor state of warehousing, inventory management and packaging will retard trade developmen*t. On the other hand, efficient warehousing, inventory management and packaging facilitates global trade.

Item no.4, *efficient supply chains reduce trade costs and makes exports of products more competitiv*e. The mean score of the item is 3.52, which is higher than 2.5, being the decision mean score. This shows that the majority of the participants concurred that efficient supply chain reduces trade costs and make export competitive in the global markets.

Item no.5, the statement reads *the state of digitalisation such as tracking systems, e-documents and trade platforms has negatively affected trade development in Nigeri*a. The mean score is 2.98 and it is higher than the decision mean score of 2.5. Thus, majority of the participants agreed that the state of digitalisation such as tracking systems, e-documents and trade platforms are in poor state in Nigeria and they negatively affect trade development in Nigeria.

Item no.6, the statement reads *weak logistics infrastructure hinders trade growth and developmen*t, the mean score of the item is 2.98, which is higher than the decision mean score of 2.5. This shows that the majority of the participants agreed that the poor states of logistic infrastructures retard trade development in Nigeria.When logistics is in a poor state, it can hinder the magnitude, volume and values from trade.

Item no.7, the statement reads *delays in supply chain negatively impact on a country's trade growth*. The mean score for the item is 3.00, which is higher than the decision mean score of 2.5. The results show that the majority of the respondents concurred that delays in supply chain negatively retard trade development. Delays in supply chain negatively hamper trade development.

Item no.8, the statement reads *reliable supply chain results in exportation of high-valued and perishable products*. The mean score of the item is 2.8, which is higher than the decision mean score showing that the majority of the participants concurred that effective supply chain aids the exportation of high-valued and perishable products. Effective supply chain is pertinent in exporting high-valued and easily perishable products such as agricultural products.

Item no.9, the statement reads *supply chain efficiency encourages the growth of export-oriented sectors.* The mean score of the item is 2.8 which is higher than the decision mean score, which shows that the majority of the respondents agreed that supply chain efficiency inspires the growth of export-oriented sectors.

Item no.10 reads the poor state of supply chain raises the risk of trade instability in the course of crises, the mean score of the item is 2.88, which is higher than the decision mean score of 2.5, showing that weak state

of supply chain raises the risks of trade instability in the course of crises. Poor state of supply chain may cause unplanned changes in product supply, which causes boom and bursts in the price cycle.

Item no.11 reads efficient supply chain helps the maintenance of trade flows during global disruptions (e.g. during pandemic), the mean score is 2.86, which is higher than the decision mean score of 2.5, showing that the majority of the participants concurred that efficient supply chain helps in the maintenance of trade flows during all times.

Discussion of the Results

From the data gathered, it can be deduced that trade logistic has a significant influence on trade development, since the majority of the respondents confirmed that trade logistics and supply chain affects market penetration, trade flows and trade competitiveness. It can be seen that majority of the responses attested that road and port logistics qualities were either moderate or low. Similar report was made by Salawu and Ghadiri (2022) reflecting logistic bottlenecks and supply chain constraints. The poor state of ports marked by inadequate infrastructure, lack of alternative transport, poor access to ports and high custom charges result in high costs of doing business, long cargo lead times and cumbersome cargo clearance processes.

Several other studies both for Nigeria and elsewhere (see Salawu and Ghadiri, 2022; Ozekhome, 2022) found out that poor state of trade logistics hinder trade development by increasing trade costs, time of communications and lead times. These findings were related to Santos-Paulina (2008) in a study including China, India and South Africa found out that in addition to its influence on export earnings, it influences the composition of exports. Furthermore, Luttermann, Kotzab and Halaszovich (2017)

and King (2010) reported a statistically significant association between trade logistics and trade development. Furthermore, in a synthesis of the literature, Salawu and Ghadiri (2021) reported that poor state of physical infrastructure, weak logistics, excessive trade regulations, corruptions at port and high handling costs significantly influence trade and competitiveness.

Conclusion and Recommendation

From the findings of the study, the followings are proffered as recommendations to improve the state of trade logistics and infrastructures and improve trade development.

First, Nigerian government should prioritise infrastructural development in its budgetary allocations. Higher share of its budget should be allocated towards upgrading roads, rail networks and port facilities to reduce delays associated with congestion, lower transport costs and improve access to the markets. Efforts should be made to increase logistic performance which will benefit both importers and exporters by facilitating exchanges of goods and services across border. Policy makers in Nigeria should be aware of this and put more efforts in reducing bottlenecks associated with excessive bureaucracy that create environments conducive for malpractices. More so, flexibility, appropriate decisions and the conveyance of adequate policies will address disruptions associated with supply chain in line with global best practices.

Second, Nigerian government should leverage on public private partnerships (PPPs) in mobilising funds and technical expertise to upgrade roads, rails and port facilities. PPPs will reduce excessive burden on the government, helps to attract funds from both local and international investors into critical infrastructures and facilitate risks sharing

between public and private sector. Private partners will address construction and operational risks, while the government manages political and regulatory risks.

Third, government must increase investment in digital trade facilitation tools, cargo handling tools and effective port management systems in order to streamline supply chain. Fourth, government should commit investment towards expanding road networks and storage infrastructure especially in rural parts of the country to boost agricultural trade, reduce poverty and foster sustainable development. Fifth, government should set up efficient regulatory frameworks for roads, sea ports and logistic services.

Conclusively, the study has examined the interrelationship among trade logistics, supply chain and trade development. Unlike past studies that use macroeconomic aggregate data, this study explored the opinions of professionals on the impact of trade logistics on trade development in Nigeria. The study validates that both supply chain and trade logistics exert significant impact on trade development.

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