ASSESSMENT OF DOMESTIC TRADE BARRIERS IN SOUTH-EAST NIGERIA: THE CASE FOR YAM.

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CERTIFICATION

This is to certify that this work "Assessment of Domestic Trade Barriers in South-East Nigeria: The Case for Yam" was carried out by **Eze, Juliet Adaugo. (Reg No. 20194197848)** in partial fulfillment for the award of Master of Science (M.Sc.) Degree in Agricultural Economics (Agricultural Marketing and Cooperative option).

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DEDICATION

This thesis is dedicated to God Almighty, whose grace and guidance have made this journey possible. I also want to dedicate it to my wonderful family, especially my dear husband and children, whose love and support have kept me going.

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ABSTRACT

The study investigated domestic trade barriers in South East Nigeria, focusing on yam trade. The specific objectives were to describe the socioeconomic characteristics of yam traders in the region, characterize the barriers to yam trade (tariff and non-tariff barriers), determine the effects of trade barriers on the volume of yam traded, estimate the profit of yam traders, and determine the effect of trade barriers on the profit of yam traders. Multistage, purposive and random sampling techniques were used to collect primary data from 120 respondents via structured questionnaire and analyzed using descriptive statistics, profit model, and Ordinary Least Squares Multiple regression. The descriptive statistics results showed the traders' mean ages in the region was 47 years and that 61% of them were male. Most of the traders were married (73%) and had attained up to secondary education. These traders maintained a mean household size of 5 persons and had been in the yam trading business for an average of 13 years. and the mean volume of yam traded across the south east was 1.8tons. The study categorized trade barriers into tariff barriers (TBs) and non-tariff tariff barriers (NTBs) alongside their associated costs. The result of the effect of trade barriers on the volume of yam traded in South East showed that quantity demanded (P< 0.1), municipal permit (P< 0.1), illegal charges (P<0.05), roadblock (P< 0.05) were significant to the volume of yam traded. The result of the extent of trade barriers affecting the volume of yam traded showed that in the south east, a total of 16747kg of yam traded and barriers such as roadblocks, produce charges, municipal permit, security charges, illegal charges and tollgates affected the volume of yam traded. There was a 12% return on investment of the yam traders in the region. This means that yam trading in the region is very profitable. The result of the effect of trade barriers on the profit of yam traders showed that tollgate (P< 0.1), produce charge (P< 0.05), roadblocks (P<0.1), and illegal charge (P<0.1) were significant to the profit of yam traders. The study recommends that the government invest in better transportation infrastructure, like road networks and rail systems, to enhance yam trading efficiency. Policymakers should also pursue reforms to address trade barriers especially those barriers that greatly affect the volume of yam traded and profits of the traders in the area.

Keyword: Yam, Trade Barriers, Tariff Barriers, Non-Tariff Barriers, Domestic Trade.

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

In Nigeria, particularly in the South-East region, significant efforts are needed to enhance, sustain, and accelerate agricultural development to improve productivity levels significantly. According to Mubamba *et al*, 2018, small-scale farmers have been the greatest contributors to agricultural food commodity production. Agriculture remains the largest sector in Nigeria which contributes about 24% to the nation's GDP in the last seven years and also contributed about 4% of global gross domestic product (GDP) (2015–2022) (National Bureau of Statistics (NBS), 2022). The sector contributed 23.36% to the nation's GDP in the first quarter of 2022, out of this, production of crops made a greater contribution than other branches in the sector. This is evident as it accounts for 92.05% of overall nominal growth of the sector in the first quarter of 2022 (NBS, 2022). In addition, it employs more than 36% of the country's labour force, a feat which ranks the sector as the largest employer of labour in the country (Oyaniran, 2020).

Since the beginning of the twenty-first century, domestic agricultural trade patterns have evolved in line with economic growth in emerging economies; in the short term, by moving food from surplus to deficit areas, trade provides an important mechanism to address production shortfalls. Appropriate agricultural and trade policies are important in strengthening the adaptation role of trade and balancing the multiple objectives of the sector. It is important to organize this trade to enhance its efficiency, growth and competitiveness which will better position it to play a strong enabling role in food security, employment generation and economic diversification (The Technical Committee on Commodities Trading Ecosystem (TCCTE), 2018).

Agricultural commodity trade being the economic activity that involves the distribution of agricultural commodities from the production points to the consumption points through the medium of exchange, is universally used to address regional or national imbalances that exist in the supply and demand for agricultural commodities (Constantin *et al*, 2022; Liu, and Zeng, 2022).

From 2000 to 2016, the value of domestic agricultural trade grew more than three times. On the average, trade in agricultural commodities showed an annual growth rate of over 6 percent, rising to USD 1.6 trillion in 2016 (Food and Agriculture Organization, FAO, 2018), while the annual growth rate was 13.42% in 2021 (NBS, 2022). The trajectory of agricultural development in Nigeria is replete with intriguing excessive of policies and programmes with undulating sequence of implementation especially since the late 1980s following the cessation of the regular development planning activities in the country. Agricultural policies, programmes and projects were featured in the various development plans until in the mid-1980s leading to abandonment of planning and introduction of Structural Adjustment Programme (SAP) (Aderibigbe, and Manson, (2018).

Nigeria is the world's highest yam producer, contributing to two-thirds of global yam production each year; and south-eastern states happen to be some of her largest contributors according to Ufondu, *et al.* (2021). The commodity after harvesting moves into the market where it is traded until it gets to the final consumers through commodity flow. Yam trade in Nigeria particularly in South-East is generally affected by some barriers from the production point to where the yam gets to the final consumers. The barriers are tariff barriers (TBs) and non-tariff barriers (NTBs). The tariff barriers (TBs) are taxes and cusaretom duties (Wallace, 2019) while The non-tariff

barriers (NTBs) as identified from literatures are; quantitative restrictions (such as quotas and licenses which limit the volume of yams allowed across borders), charges on imports (levies, border tax countervailing duties), government participation in trade (such as the use of subsidies, procurement policies and competitive policy), customs procedures (clearance and classification procedures) and technical trade barriers (such as Packaging, labelling, health and sanitary regulations) (Bouët *et al*, 2017). These TBs and NTBs have presented serious limitations in the ease of trade for domestic commodities, particularly yam. Economists averred that these TBs and NTBs are detrimental to regional trade.

1.2 Statement of Problem

In recent times, the costs of doing business and food commodity distribution including yam have become increasingly high and both the producers and the consumers pay higher prices. Yam production in Nigeria for a particular region oftentimes does not meet the demand and hence, inter-state trades are made to meet demand. This means that the commodity oftentimes needs to pass through state and local borders to reach the final consumers. This flow is fraught with barriers which hinder the free flow of the commodity (yam) to consumers across the Southeastern region of the country. These barriers are usually categorized as tariff and non-tariff barriers. The tariff barriers range from taxes to custom duties and others while the non-tariff barriers could be quotas, licenses, levies, custom procedures like clearance; government participation in the form of subsidies and policies, etc. These tariff and non-tariff barriers, along with other restrictions, have resulted in high prices for consumers and protected producers from competition. According to International Trade Association (ITA)(2021), the high cost of doing business in Nigeria and her States is a daunting challenge to investors in acquiring infrastructures and other resources needed for the investment. This could be the reason there is lack of the

presence of many investors in yam production and distribution enterprises except the indigenous yam farmers whose volume of trade cannot be measured with those of states like Taraba, Benue and other States that ranked high in yam production and trade. If this is not addressed holistically, it will affect the development of the sector and economic growth in food commodity trade in South-East, leading to high cost of trade and distribution. According to World Bank (2019), hike in the yam commodity price can hurt households particularly poorer households, which spend a large portion of their disposal income on food and also the sellers who spend huge amount of money paying tariffs.

Tariff barriers and non-tariff barriers have affected not only yam but the trade flow and the redistribution of some agricultural commodities, as well as affected the profits that these traders of these commodities would have earned. NTBs have posed significant challenges to agricultural commodity trade and have negatively impacted the trade dynamics of commodities leading to high prices and a reduction in the choices of consumers from consuming the commodities (Adinnu,2023). Studies have shown that in 2015 and 2020, agricultural commodities such as rice, live or dead birds including frozen poultry, pork, beef, bird's eggs, excluding hatching eggs, tomato and its pastes, dairy, maize, etc. are restricted through TBs and NTBs so as to boost the domestic production of these commodities to ensure the availability and affordable market prices for both the traders and consumers (International Trade Association, (ITA), 2020). The barriers instead of achieving the aim have worsened the prices of these commodities and have been unable to meet the demand for these agricultural commodities particularly in the South-East. Constant delays, quota sizes, different levies, and taxes paid by these traders as they move the commodities have greatly reduced the profits traders would have made. accordingly, they tend to increase the prices limiting the choices of the consumers. It is increasingly obvious that these

NTBs and TBs mitigate the trade flow and the distribution of agricultural commodities particularly yam in the domestic trade, hence affecting the prices the consumers offer to consume yam (Adinnu, 2015). If this is not addressed, the consumers and the traders will continue to experience high costs of yam and losses in earning (profits) on yam trade in the South-East.

The discussion about trade and trade barriers has been a central theme in international and development economics literature for over a century. A lot of effort has been made globally to make trade freer and more open. Many international organizations, bodies, arms and policy documents have been set up to help achieve this vision. Some of such include: World Trade Organization (WTO) and Economic Community of West African States (ECOWAS) and more recently African Common Free Trade Area (AfCFTA). All these are pitched towards the single goal of liberalizing trade across countries. Interestingly, Nigeria is a member of these organizations. However, while great efforts has been made on the international sphere to make trade free, little or no attempts seem to have been made domestically to make trade freer. This situation is even worsening the more with the death of commodity marketing boards.

Studies exist on trade liberalization (Manni and Afzal 2012); Mkubwa, *et al.,* (2014) wherein they indicated that trade openness has a positive and significant impact on economic growth. Furthermore, Umoru and Eborieme (2013) along with David-Wayas (2014) demonstrated that trade barriers have a significant and positive effect on Nigeria's economic growth. According to Nsikak-Abasi and Kesit (2015), trade liberalization is a major obstacle to boosting agricultural production in Nigeria. Some others such as Ufondu, *et al.,* (2021) and Umar *et al.,* (2021) were on yam production and marketing in some South East and North Central zones respectively,

From the foregoing, it is obvious that most of the studies conducted on yam and trade were either cross-country based or focused on Nigerian situation as whole without specific focus on TBs and NTBs. Many of them focused on trade liberalization and yam production/marketing rather than trade barriers on yam. The studies showed different results on the effect of barriers to trade on the economic growth. Some showed positive relationship to growth in the economy while the others showed negative relationships.

There then appear to be dearth of study in South-East, of this nature. The proposed study fills the knowledge gap.

1.3 Objectives of the study

The main objective of the study was to assess domestic trade barriers in South East, Nigeria using yam as a case study. The specific objectives were to:

i. describe socioeconomic characteristics of yam traders in South East, Nigeria;
ii. characterize the barriers to yam trade in South East, Nigeria vis-à-vis TBs and NTBs;
iii. to determine the effect of trade barriers along category lines vis-a-vis TBs and NTBs on yam trading in the study area;
iv. describe the extent to which trade barriers affected volume of yam traded in the area;
v. estimate the profitability of yam traders in the area, and
vi. estimate the effect of TBs and NTBs on the profit of yam traders in the study area.

1.4 Hypotheses of the study

The following hypotheses were tested;

i. TBs and NTBs do not negatively and significantly affect volume of yam trade in South East, Nigeria.

ii. Tariff and non-tariff barriers have no significant effect on the profitability of yam traders.

1.5 Justification of the study

The study is significant to the South East in policy formulation, particularly in enhancing business operations within the region. Its empirical results will provide insights into the role of trade barriers in shaping commercial activities and trade volumes, and how these outcomes may influence the economic welfare of the South East.

Additionally, this study would boost the existing body of knowledge on trade barriers in food commodity trade. The information will be useful for further research.

In addition, at the end of this study, the results and findings of this study would reveal how barriers to trade affect the economic growth of the South East. Economists believe that a steady removal of trade barriers would help expand the trade flow between trading partners and hence improve the income and livelihood of producers and traders.

Recommendations arising from the study will help in shaping policy thrust on trade barriers among the regions in Nigeria with particular reference to yam trade. This is even more appropriate and strategic now that regional block can stimulate economic growths and development through free trade.

CHAPTER TWO

LITERATURE REVIEW

2.1 Conceptual Literature

2.1.1 Concept, definition, and meaning of trade barriers

A tariff refers to a tax or duties, in the form of customs duties, levied by a trading country on goods and services imported into its shores (Aka-Wolugbom *et al.*, 2018). The imposition of a tariff on imported goods and services increases the price of these goods and services, ultimately making them less attractive to buyers in that country. The motive behind the imposition of tariffs by the government could be to raise the revenue generated or to protect small-scale local industries in its shores from foreign competitors until such a time when they are fit to compete favorably in the international market. Protection of small companies could also translate to job protection and the advancement of local expertise, particularly in the development of an in-house technological base and confidence. Tariffs are mostly employed as a trade barrier by nations in the form of import duties. They could be classified as specific tariff, ad-valorem tariff or compound tariff. In specific tariff, a fixed fee is levied on a type of item or service imported into a country, for instance $2,500 on drilling equipment. When a tariff is levied on a good or service based on its value, for instance 2% of the drilling equipment value, then it is termed an ad-valorem tariff (Aka-Wolugbom *et al.*, 2018). A third type of tariff called compound tariff is a combination of specific and ad-valorem tariff.

Researchers have found that the imposition of tariff with the intention of protecting infant industries could have an unintended consequence of making the local industries a lot inefficient as competition is reduced. This could be hurting to consumers as they are left with no choice for

their purchase. The local producers are enriched for 'doing nothing' (United Nation conference on Trades and Development (UNCTAD), 2022).

Non-tariff barriers is the use of trade restrictions that is not in the form of tariff. These include sanctions, quotas, embargoes, e.t.c. (UNCTAD, 2022). Other forms as used in Nigeria are buy-Nigeria-made-goods, government participation and subsidies, administrative procedures, foreign exchange controls in the form of currency devaluation (Trading Economics, 2017).

Shenkar *et al.,* (2008), define a non-tariff barrier as a non-transparent form of trade restriction that are not anchored in official regulations and laws. This form of trade restrictions is very difficult to tackle by participating nations as they do not officially exist and thus cannot be removed by any form of negotiation. Further examples are technical standards, corruption, foreign sales corporations. Most developed nations apply this form of barrier on exports from less developed countries. For instance, Nigeria food exports to European Union and the United States most times face stiff restriction based on labelling, packaging and analysis of nutritional content. These restricting countries knowing that the local industries in less developed countries are still less sophisticated to provide such expert analysis and packaging requirements, maintain such controls as a way of trade barrier (Shenkar *et al*, 2008). While such restrictions may be very reasonable at the face value, it adds additional burden to small and medium scale exporters from a developing nation. Having to meet these administrative requirements adds to the production cost and ultimately reduces the competitiveness of these infant firms. Furthermore, corruption and corrupt practices could be a form of non-tariff barrier to trade (Shenkar *et al.*, 2008). Nigeria's ranking on the corruption perception index of the World Bank in 2017 is 145 out of 175 countries surveyed and her ease of doing business was at a grading of 145 out of 190 economies (Trading Economics, 2017; Transparency International, 2017).

According to Evan (2021), non-tariff barrier is also defined as a way to restrict trade using trade barriers in a form other than a tariff. Non-tariff barriers include quotas, embargoes, sanctions, and levies. As part of their political or economic strategy, some countries frequently use non-tariff barriers to restrict the amount of trade they conduct with other countries. It is any measure, other than a customs tariff, that acts as a barrier to international trade. These include: regulations: that is any rules which dictate how a product can be manufactured, handled, or advertised.

Countries commonly use non-tariff barriers in international trade. They take decisions on when to impose the non-tariff barriers, and these decisions are influenced by the political alliances of a country and the overall availability of goods and services. In general, any barrier to international trade including tariffs and non-tariff barriers influences the global economy because it limits the functions of the free market. The lost revenue that some companies may experience from these barriers to trade may be considered an economic loss, especially for proponents of laissez-faire capitalism. Advocates of laissez-faire capitalism believe that governments should abstain from interfering in the workings of the free market (Evan, 2021)

Countries can use non-tariff barriers in place of, or in conjunction with conventional tariff barriers, which are taxes that an exporting country pays to an importing country for goods or services. Tariffs are the most common type of trade barrier, and they increase the cost of products and services in an importing country (Xi He, 2021). The diagram below shows the trade barriers classification

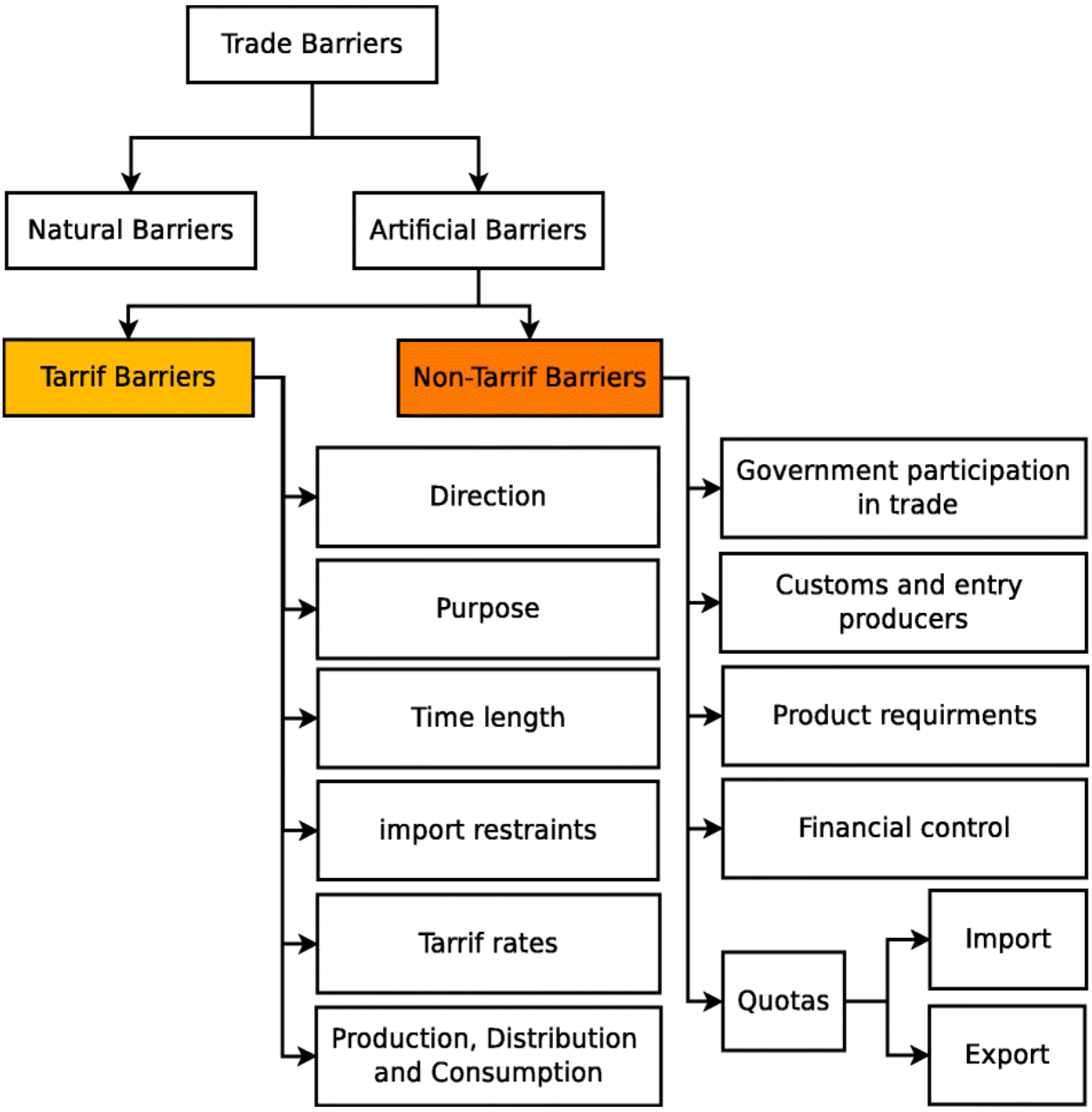

Fig 2.1 (The Office of the U.S. Trade Representative (USTR). Foreign Trade Barriers. 2021)

2.1.2 Types of Non-tariff barriers

There are different types of non-tariff barriers, they are:

(i) Licenses

Countries often use licenses to restrict imported goods to certain businesses. A business granted a trade license is allowed to import goods that would otherwise be restricted from trade within the country.

(ii) Quotas

A quota is an imposed trade restriction by the government that limits the numeric or monetary value of commodities that a country imports or exports during a particular period. Countries use quotas in international trade to help regulate the volume of trade between them and other countries. Sometimes quotas are imposed on specific products to reduce imports, increase domestic production by restricting foreign competition. Countries establish quotas by setting specific limits on the amount of products and services that can be imported. Generally, there are no restrictions on importing these goods and services until the quota is reached, and quotas are often set for a particular period. Quotas refer to the time-bound restrictions governments impose on trade. This is generally done to protect and encourage domestic business and balance trade (Evan, 2021).

(iii) Embargoes

Embargoes occur when a country or multiple countries officially prohibit the trade of certain goods and services with another country. Governments typically impose embargoes to achieve

specific political or economic objectives. An embargo is a restriction in trade, typically adopted by a government, a group of countries or an international organization as an economic sanction. Embargoes can bar all trade, or may apply only to some of it, for example to arms imports. They are designed to punish the targeted country for its actions, and to deny it the means to carry out objectionable policies. Countries use embargoes to punish and deter objectionable behavior without resorting to military force, often in response to human rights violations and armed conflict. A widely observed embargo can be a powerful tool, isolating the targeted country and denying it the benefits of international trade. Countries dependent on global trade or technology imports are especially vulnerable to embargoes. In contrast, determined authoritarian regimes have successfully resisted embargoes for decades, often at immense cost to living standards (Evan, 2021).

(iv) Sanctions

Sanctions are imposed by countries on other nations to restrict their trade activities. These sanctions often involve increased administrative measures or additional customs and trade procedures, which can slow down or limit a country's capacity to engage in trade. Trade sanctions are legal restrictions on trade with a country. Trade sanctions are a sub-category of economic sanctions, which are economic penalties imposed on a country to accomplish policy goals beyond the sanctioned economic activity (Will, 2022).

2.1.3 Nigeria Tariff and Non-Tariff measures

The use of trade restrictions in ways other than tariff is regarded as non-tariff barriers. These include sanctions, quotas, embargoes e.t.c. Other forms as used in Nigeria are buy-Nigeria-made-

goods, government participation and subsidies, administrative procedures, foreign exchange controls in the form of currency devaluation (Aka-Wolugbom *et al.,* 2018). Most developed nations apply this form of barrier on exports from less developed countries. For instance, Nigeria food exports to European Union and the United States most times face stiff restriction based on labelling, packaging and analysis of nutritional content. These restricting countries knowing full well that the local industries in less developed countries are still less sophisticated to provide such expert analysis and packaging requirements maintains such controls as a way of trade barrier (Shenkar & Luo, 2008). While such restrictions may be very reasonable at the face value, it adds additional burden to small and medium scale exporters from a developing nation. Having to meet these administrative requirements adds to the production cost and ultimately reduces the competitiveness of these infant firms.

Further, corruption and corrupt practices could be a form of non-tariff barrier to trade (Shenkar & Luo, 2008). Nigeria's ranking on the corruption perception index of the World Bank in 2017 is 145 out of 175 countries surveyed and with the ease of doing business at a grading of 145 out of 190 economies (Trading Economics, 2017; Transparency International, 2017). All these have led to under investment in the Nigeria economy by foreign firms and with many investors already in the country at the verge of leaving. Ultimately, the technological transfer that ordinarily would have been witnessed due to the presence of foreign investors are lacking, thus the poor development of industries in the country. Most firms from developed countries particularly those that have legislations against bribery and corruption, example the United States, may not advance trade ties with or in countries where bribery and other forms of corruption is prevalent. Countries where copyright laws and intellectual property rights are not upheld may witness less trade ties with exporters who value such rights and may not want their trade secrets

compromised. Because of the relatively weak technological development of Nigerian industries, the use of non-tariff measures as trade restriction instrument could trigger retaliatory actions from trading partners, which could further worsen the competitive position of the country in the international trading arena.

2.1.4 Definition of non-tariff measures

Non-tariff measures are often more complex and varied than duties. They are generally defined as measures other than customs tariffs that can have an economic effect on international trade. Non-tariff measures cover a wide range of policy instruments put in place by countries wishing to protect their markets from foreign competition. These can include quotas, standards, and technical barriers, among others. The United Nations Conference on Trade and Development has identified and classified these measures under two major categories which are non-tariff export measures and non-tariff import measures. Non-tariff import measures are further divided into two subgroups: technical measures and non-technical measures (Pat, 2017)). The two classifications are presented in table 2.1 below.

Table 2.1 Non-Tariff Measure Classification

Imports	**Technical Measures**	A. Sanitary and phytosanitary measures: measures to protect human, animal and plant health. B. Technical barriers to trade: measures related to conformity assessment procedures on products, such as evaluation, verification and certification C. Pre-shipment inspection and other formalities: includes quality and quantity and price control of goods prior to shipment.
	Non –Technical Measures	D. Contingent trade protective measures: includes antidumping, countervailing and safeguard measures. E. Non-automatic licensing, quotas, and other quantitative controls: these measures aims at restraining the quantity of commodities that can be imported. F. Price controls: measures to control or affect the prices of imported goods, such as minimum import prices, excise and other taxes. G. Finance measures: measures to regulate access to and cost of foreign exchange. H. Measures affecting competition: measures to grant exclusive or special preferences or privileges to one or more limited group of economic operators. I. Trade-related investment measures: requirements to use a minimum level of domestically sourced products. J. Distribution restrictions: for example, imported beverages may only be sold in cities having a facility to recycle the containers. K. Restrictions on post-sales services: measures restricting producers of exported goods to provide post-sales service in the importing country. L. Subsidies: financial contribution by a government to an industry or business. M. Government procurement restrictions: measures controlling the purchase of goods by government agencies, generally by preferring national providers. N. Intellectual property: covers patents, trademarks, copyright, geographical indications, etc. O. Rules of origin: rules applied by governments of importing countries to determine the country of origin of goods.
	Exports	P. Export-related measures: measures applied by the government of the exporting country on exported goods.

Source: United Nation Conference on Trade and Development, International Classification of Non-Tariff Measures, 2017 version**.**

2.1.5 Concept of domestic trade

Domestic trade can be defined as the exchange of domestic goods within the boundaries of a country. Domestic trade may also be sub-divided into 2 categories: wholesale and retail. It is the supply and demand of goods, services, and securities within a single country. Ngige (2018) stated that domestic trade has been, and continues to be, an economic force that drives commerce, fosters technological advancements and growth, and disseminates cultural patterns across the global community, stimulated exploration, colonization and frequently fanned the flames of war. The direction of domestic trade in staple foods is largely north-south between different ecological zones but also between major urban centres in the southeast and southwest. The southern states supply plantains, cassava, kola nuts, and fruit to the northern states, which in turn supply beans, onions, and livestock to the southern states. Yams from the central region are traded in the southern and far northern cities. Most of the food items and manufactured goods are sold in open market stalls, in small neighborhood shops, and on the streets.

Emehelu, (2021), defines internal/domestic trade as all commercial transactions (government and private, sales, investments, logistics, and transportation) that occur between two or more states within the boundaries of the nation. oftentimes, private companies undertake these transactions for profit purposes while the governments undertake them for both political reasons and profit. It refers to all the commercial activities that involve inter-boundary transactions of goods, services, resources between two or more states. Afolabi, Danladi, and Azeez, (2017) defines domestic trade as the interchange of goods, and services within local territories. In most states, such trade represents a significant share of gross domestic product (GDP). United Nations Conference on Trade and Development (UNCTAD)(2018) said that a growing body of work argues that dismantling labour market segmentations locally would be wealth generating and pro-poor and

lead to more egalitarian distributional outcomes. Egbetunde, and Obamuyi, (2018) citing other economic scholars infer that domestic trade is a function of local trade whereby goods produced in one state are supplied to another state for future sale or trade. Ajayi, and Araoye, (2019), explains domestic trade which is also referred to as local or internal trade as a business activity existing between two or more states. They also defined domestic trade as an activity that essentially involves willing exchange of goods and services across boundaries of states. They held that the role of local trade in economic development is considerable and that domestic trade integration appears to be a logical way to enable an economy to produce at lower unit costs for a larger (local) market.

2.1.6 Evolution of commodity trade

Commodity trading history can be traced to the agricultural revolution of 8500BC during which farmers and traders fashioned a means to secure prices of commodities against price fluctuation caused by weather, conflict, and supply and demand gap. Trading evolution, excess supply and the quest of merchants to raise money while commodity was in storage formed the basis for futures agreement. The first recorded commodity futures trades occurred in the 17th century in Japan, although there exists proof that in China, rice possibly was traded some 6,000 years ago. The first contract for a future price was created in the early 1800s in the US. This forward contract allowed a buyer to pay for the commodity in advance of taking delivery of it. The Chicago Board of Trade (CBOT) was set up in 1848; trading in contracts that were standardized in terms of quantity, quality and delivery. The CBOT added soybeans contract in 1936 and has since merged with the Chicago Mercantile Exchange to form the CME Group. Exchanges added cotton and lard contracts in the 1940s while livestock was added in the 1950s. Contracts for precious metals such as silver started trading during the 1960s. By the 1970s, when global

currencies were delinked from gold prices, currency value fluctuated based on supply and demand, and financial futures became a tradable "commodity". With that, it became possible for cash settlements of trades instead of the traditional physical "delivery" of commodities. In the 1980s and 90s, stock indices such as the S&P 500 and government debt instruments were introduced (TCCTE, 2018).

Technology brought considerable innovation to the market including online trading which has heightened interest in commodities and futures trading as buyers and sellers could from the comfort of their homes and offices, place trade orders through electronic trading systems and online brokerage houses. Apart from providing hedging instruments for commodities, the futures market has become an important hedging mechanism against possible losses in financial instruments such as stocks and bonds. Nevertheless, it is vital to state that interest in futures trading is not only to hedge the price of a commodity against an adverse price movement but it can also be used as a speculative instrument to profit from a desired price movement which could be up or down (Frederick, 2015).

2.1.7 History of commodity trading in Nigeria

Some of the modern-day agricultural marketing challenges such as access to market and Produce funding were also present in the colonial era and responsible for the setting up of the Produce Marketing Boards by the colonial administration. The boards were to link the peasant farmers to market at stable prices. The Marketing Boards were set up in the three existing regions between 1947 and 1963 before the Western Region was spilt into Western and Mid-Western Regions. Cocoa Marketing Board was established in 1947 in the Western Region while Cotton and Groundnut Marketing Boards were set up in the Northern Region and Palm Produce Marketing Board in the Eastern Region in 1949 (CBN, 2015).; TCCTE, 2018).

The Boards were set up not just for price stabilization but to serve as a source of funds for the economic enhancement of the regions as well as to carry out and report findings principally in cocoa, cotton, groundnuts, palm products, and rubber.

The commodity boards subsequently set up "gazette markets" across the country where the commodities were subjected to quality checks before they were bought from the Licensed Buying Agents (LBAs). The LBAs had produce buyers accredited to buy on their behalf. The produce buyers in the process went to different villages and farmsteads to buy the produce based on weight, physical appearance of the produce and allowance for possible quality defects from the farmers. They paid the farmers on the spot or sometimes at a later date depending on the relationship between them and the farmers. This arrangement largely promoted quality assurance right from the farm gates where the produce was inspected for quality prior to payment of farmers.

It was this quality assurance and the adherence to best agronomic practices by farmers that enhanced agricultural production and exports, and financed development projects in the regions. For storage of their produce, the regional governments built warehouses, many of which were large warehouses around the port area for their export commodities.

Warehouses start usually as storage device set up by commodity owners during seasons when harvest exceeds consumption. It is then reasonable to say that in Nigeria, farmers started storage facilities to keep seasonal harvest of the crops. With increased communal interactions in the early years, trading activities also increased, eliciting different forms of storage arrangement. By the time the European traders came into the scene, the first set of structured warehouses or stores were built. These were essentially owner-operated or subsidiary warehouses as they were operated by the owners or by subsidiary companies, which were wholly owned and controlled by

their parent companies based locally or overseas. Colonial trading giants like John Holt, GB Ollivant and United African Company (UAC) owned the oldest of warehouses in Nigeria. The warehouses were used to store mainly export produce and imports from their parent companies. The companies simply establish their own warehouse standards, which were adopted from their parent company or home country. There were no national standards or agencies until the introduction of the Federal Produce Inspection Service (FPIS) and State Produce Inspection Service (SPIS) in 1954.

The developmental impact of the marketing boards cannot be overemphasized as that period witnessed the establishment by the regional governments of some academic citadels such as the University College Ibadan (now University of Ibadan), University of Ife, University of Nigeria and Ahmadu Bello University. Funding of these institutions came from revenue from commodity exports. Besides these institutions, other landmark projects and policies were executed/implemented through revenue from the activities of the marketing boards. They included the founding of the foremost television station in Africa, the Cocoa House, which was the tallest building in Nigeria at that time and the free primary education programme by the Western Regional Government, which was funded by proceeds from cocoa. The Eastern Regional government did the same by implementing free primary education programme in 1957 from Palm Produce and Rubber exports while the Northern Region also undertook development projects from such export proceeds. The surplus that accrued to the regional governments from commodity exports arose from the difference between producer prices as fixed by the government of each of the regions and the prices at which the produce were sold overseas by the Nigerian Marketing Company established for this purpose by the Federal Government. The marketing boards later became Commodity Boards with the creation of states in 1967.

Under the marketing board arrangement, the farmers gradually felt short changed by what they received and formed a pressure group to protect their interest. One remedy they sought was an increase in producer prices approved by the boards. There are arguments today, as to the success of the marketing boards. For instance, some argued that the marketing boards only succeeded to some extent in stabilizing seasonal producers' price, but achieved little in stabilizing producers' income. The commodity boards were scrapped following the liberalization of the economy under the Structural Adjustment Programme (SAP) in 1986.

Ironically, commodity exporters to date, still buy cash crops on the basis of the framework developed by the commodity boards. However, unlike the era of commodity boards when farmers knew the buying price of all commodities under each board's control, farmers nowadays suffer from price information asymmetry as they don't know what the price of what they are selling goes for in the next village or the next rural market. It is these and other challenges that reinforce the need for the establishment of commodities exchanges as alternative marketing platform for commodities. The Central Bank of Nigeria noticed the vacuum created by the abolition of Commodity Boards in 1986 and advised the Federal government to establish a Commodities Exchange.

There was no gainsaying that the abolition of the commodity boards affected the standards and quality of commodities particularly, export produce, as there was no strong quality control and grading agency to ensure standards of the commodities. The private sector perhaps saw a business opportunity in the newly liberalized commodities business and paid little attention to quality. As a result, substandard commodities became wide spread. This defect was to impact negatively on the reputation of Nigeria's export commodities.

The intervention by the Central Bank was therefore, an attempt to address the resultant effect of scrapping the marketing boards. The thinking was that a commodities exchange would provide standards and grading and assume that function of the commodities board and invariably promote produce quality, particularly of exports. Obviously, while this was a major concern for the CBN, it also recognized the wider benefits of having a thriving commodity exchange in the country. An Inter-Ministerial Technical Committee was consequently set-up in 1989 to examine the possibility of setting up a commodities exchange in the country. The committee submitted its report a year later supporting the establishment of a commodity exchange.

However, there was no evidence that concrete action was taken by government to do so. Nonetheless, an unsuccessful attempt was made by FALCOMEX, a private sector initiative, to establish a commodity exchange. Other than these efforts, no other attempt either by government or the private sector is known to have been made until August 8, 2001 when the Federal Government directed the conversion of the then Abuja Stock Exchange to a Commodities Exchange vesting the Ministry of Finance with the responsibility of midwifing the conversion process.

In 2014, Stock Exchange Commission (SEC) developed a 10-year capital market master plan to transform the Nigerian capital market. Mindful of the need to have an organized commodities market, one of the recommendations of the master plan is to develop thriving commodities trading ecosystem. To achieve this mandate, the SEC set up a committee consisting of major stakeholders to review and come up with recommendations and road map for implementation. These efforts are key to the development of the commodities market (TCCTE, 2018).

2.2 Theoretical Literature Review

2.2.1 Theory of export

According to Nwakoh (2017) export means shipping commodities and services out of the jurisdiction of a nation. The seller of such commodities and services is referred to as an "exporter" and is operates in the country of export whereas the abroad-based buyer is referred to as an "importer". International trade, "exports" refers to selling goods and services produced in the mother country to other markets.

Export of commercial quantities of goods normally requires involvement of the customs authorities in both the country of export and the country of import. The advent of small trades over the internet such as through Amazon and E Bay have largely bypassed the involvement of Customs in many countries because of the low individual values of these trades (Jeffrey 2015). Nonetheless these small exports are still subject to legal restrictions applied by the country of export. An export's counterpart is an import.

Nwakoh (2017), the theory of international trade and commercial policy is one of the oldest branches of economic thought. Exporting is a major component of international trade. The macroeconomic risks and benefits of exporting are regularly discussed and disputed by economists and others. Two views concerning international trade present different perspectives. The first recognizes the benefits of international trade. The second concerns itself with the possibility that certain domestic industries (or labourers, culture) could be harmed by foreign competition.

Export methods involve sending a product, good, or information through various means such as mailing, hand delivery, air or vessel shipping, uploading to an internet site, or downloading from

one. Additionally, exports encompass the dissemination of information via email, email attachments, fax, or during phone conversations

2.2.2 The Heckscher-Ohlin (H-O) Theorem

According to Nwakoh, (2017), the Heckscher-Ohlin (H-O) theorem holds that trade between countries arise because different countries have different factor endowments. Thus, countries that have abundant labour will trade labour-intensive commodities while those with abundance of capital will export capital-intensive goods. According to the H-O theorem, for instance, Nigeria will specialize on production of goods and services that require cheap labour available in the country, while USA will specialize on production of goods and services using cheap capital. The theory assumes that there are two commodities, two countries, no transport cost, no qualitative difference in factors of production, identical production functions, constant return to scale and full employment, among others. Leontief, however, negated the H-O theorem as he found that the US exports labour intensive goods and services and imports capital intensive goods and services, contrary to the theorem and this is the popular Leontief Paradox. From the foregoing discussion, it is worthy to note that both the Ricardian and H-O theories are important to this study. This is because for a country to maximize the benefits of international trade, both comparative advantage and specialization are key.

2.2.3 Theory of comparative advantage

This theory of comparative advantage can be said to be the most vital idea in international trade theory. It is also one of the most commonly misunderstood principles. There is a common saying among economists that once when a pessimist asked Paul Samuelson (a Nobel laureate in economics) to provide a reasonable and nontrivial result from the economics discipline, Samuelson quickly responded, “comparative advantage**.**” The sources of the misunderstandings

are easy to identify. First, the principle of comparative advantage is clearly counterintuitive. Many results from the formal model are contrary to simple logic. Second, it is easy to confuse the theory with another notion about advantageous trade, known in trade theory as the theory of absolute advantage.

The logic behind absolute advantage is quite intuitive. This confusion between these two concepts leads many people to think that they understand comparative advantage when in fact what they understand is absolute advantage. Finally, the theory of comparative advantage is all too often presented only in its mathematical form. Numerical examples or diagrammatic representations are extremely useful in demonstrating the basic results and the deeper implications of the theory. However, it is also easy to see the results mathematically without ever understanding the basic intuition of the theory.

The early logic that free trade could be advantageous for countries was based on the concept of absolute advantages in production. Adam Smith wrote in *The Wealth of Nations*, "If a foreign country can supply us with a commodity cheaper than we ourselves can make it, better buy it of them with some part of the produce of our own industry, employed in a way in which we have some advantage".

The idea here is simple and intuitive. If our country can produce some set of goods at a lower cost than a foreign country and if the foreign country can produce some other set of goods at a lower cost than we can produce them, then clearly it would be best for us to trade our relatively cheaper goods for their relatively cheaper goods. In this way, both countries may gain from trade.

2.2.4 Theory of comparative cost

Comparative cost assumes that trade will be beneficial to a country if it concentrates in the production of those goods in which it has the greatest relative advantages over its trading partners. The law is how ever an extension of the absolute paradigm in industry. That is gain will be available to a given country so long as it transfers resources towards the industry in which its absolute or comparative advantages is greater.

The country then sells the surplus to other countries that in their turn channel resources towards those industries in which their deficiency is least. The theory discussed above depends on the existence of certain conditions for international trade, and complications arise if these conditions are not met. These conditions include; Existence of free trading environment that enables a country to concentrate on the production of the good or goods for which its comparative advantage is greatest. There should be free movement of factors from one industry to another. The production opportunity cost ratios in different countries must differ. The exchange rate of currency must lie between the limits set by the international (non-trading), price ratio for different product. Transport cost should not be so high to out reign the price advantage enjoyed by exporter over domestic producers. Trade should not be seriously inhibited by artificial barrier to trade (Emehelu, 2021).

2.2.5 Nigeria foreign trade and export growth rate

According to National Bureau of Statistics (2022), Nigeria's total merchandise trade in the fourth quarter of 2021 stood at ₦11,707.20bn, 74.71% higher when compared to the value recorded in the Q4, 2020. The share of Exports in total trade stood at ₦5,766.62bn, 49.26% in Q4, 2021. Imports value in the Q4, 2021 accounted for ₦5,940.58bn, 50.74% of total trade. The Balance of Trade in the period under review stood at (₦173.96 billion), this shows a deficit trade with an

improvement of 12.72% over the preceding quarter. Export trade in the quarter under review stood at ₦5.77Trillion indicating an increase of 12.27% over the preceding quarter and the value in 2021 also grew by 80.52% over the corresponding period of 2021.

Export trade by region in Q4 2021 shows that Nigeria exported most products to Europe with goods valued at ₦2,408.39 billion or 41.76% of total exports, Asia (₦1,875.56 billion, or 32.52% of total exports) and Africa was ₦773.83 billion or 13.42% of total exports of which ₦250.52 billion worth of goods were exported to ECOWAS countries and exports to America amounted to (₦702.74 billion, or 12.19% of total exports).

2.2.6 Commodity trading and its importance to economic growth

According to the Technical Committee on Commodities Trading Ecosystem, TCCTE, (2018), Commodity trading ecosystem is the environment within which commodities trading takes place and directly or indirectly, affects activities and development of the commodities market and the exchanges. The ecosystem is comprised of various elements, which are important to the structures and developments of the market and vital to the smooth and efficient functioning of a commodity market or exchange. The ecosystem cut across all spheres of the commodity trading environment such as its operations, products traded, infrastructure, logistics, traders/brokers, commodity merchants, farmers, miners, end users and other stakeholders. It also covers the legal and regulatory environment. If these elements are absent, inefficient or underdeveloped, the commodities trading ecosystem would not be well functioning and so maximum value may not be derived from its existence.

A commodities market is simply a market, a medium for connecting buyers and sellers of commodities. It may be formal (organised) or informal (unorganised), have physical location with central trading places or virtual without a specific trading location, in which case trading

can be conducted remotely by participants. Our focus is however, primarily on promoting the formal or organized market such as commodity exchanges, which provide a formal and more structured mechanism for trading in designated commodities.

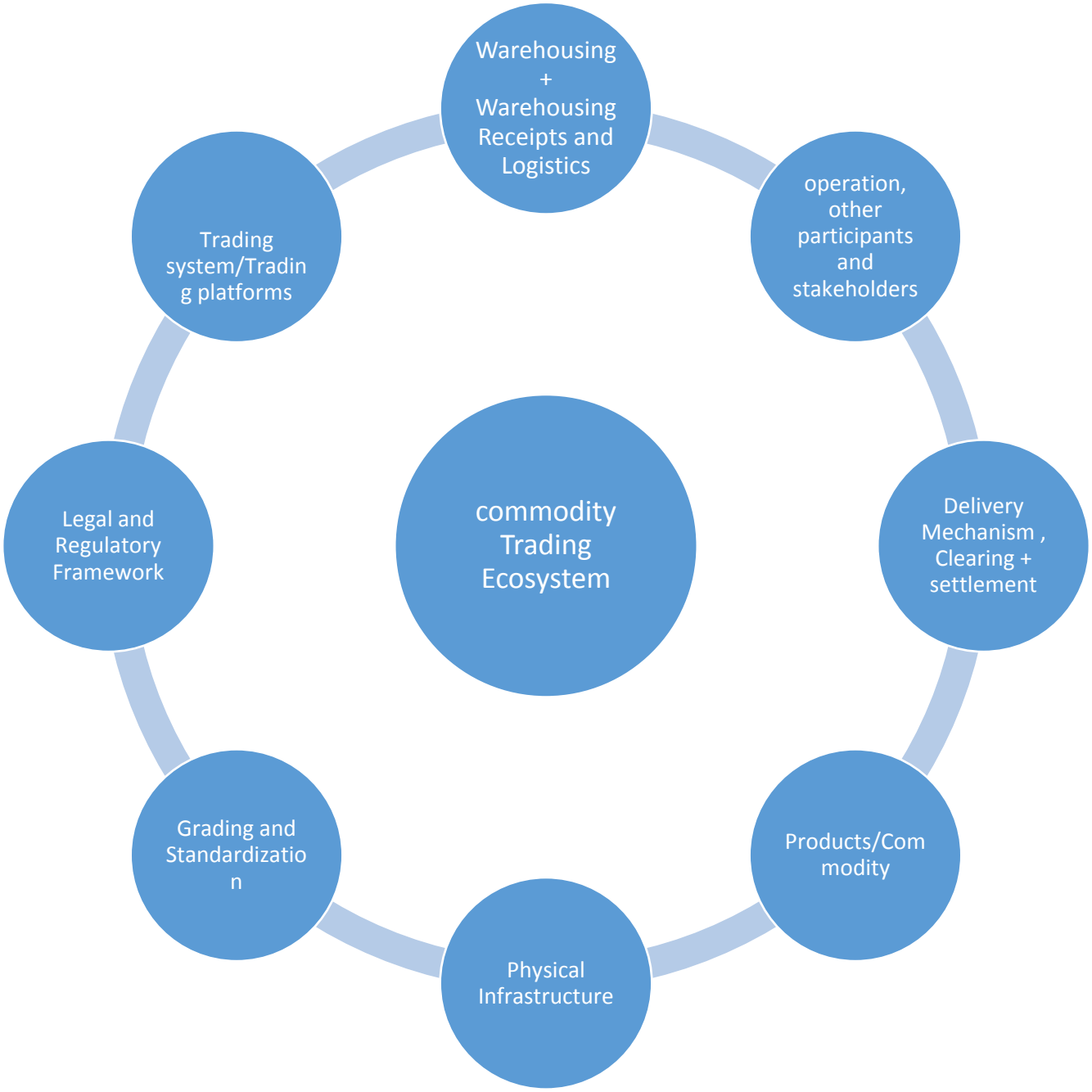

Figure 2.2 Commodity trading ecosystems

Source: The Technical Committee on Commodities Trading Ecosystem, (TCCTE, 2018)

2.2.6.1. Commodity exchange

A commodity exchange is a market, which provides facilities (platform), regulations and standards for the orderly, efficient and transparent trading of selected commodities. Contracts are created with standardized features, which thereafter become tradable financial instruments. The commodities traded may or may not be for delivery and indeed in many exchanges, most trades are not for physical delivery. Commodity exchanges tend to gravitate from spot market to forward to the more complex derivatives market (The Technical Committee on Commodities Trading Ecosystem, (TCCTE, 2018).

2.2.6.2. Types of commodity market

Commodities market can be broadly classified into the Cash or Spot Market and the Derivatives Market as presented in Figure 1 below. In the cash market, transactions are conducted for immediate delivery of physical commodities or securities while in the derivative market delivery is at a future date. The derivative market can be broadly categorized into the forward and futures markets. The forward market trades in contracts of commodities and financial instruments which are for future delivery but customized to the specifications of the transaction parties. They are traded over-the-counter and not on an exchange. In other words, a derivatives commodities market deals in financial contract between parties, which is derived from ascertaining the value of an underlying commodity. Because the derivative market relies on the price of the underlying market, it is essential that a strong cash (spot) market exists prior to the introduction of derivatives.

In the futures market, buyers and sellers agree on the quality and quantity of a specified commodity to be delivered at an agreed price and date in future. In the options segment, parties

enter into contract that confers the right, not the obligation, of a buyer to buy or sell a given commodity at a particular price for delivery on or before a given period.

A major distinction between the cash and derivatives commodities market is that transactions in the cash market are usually carried out by buyers who have immediate use for the commodity purchased while transactions in the derivatives market do not often result in physical delivery as they can be offset before the delivery date.

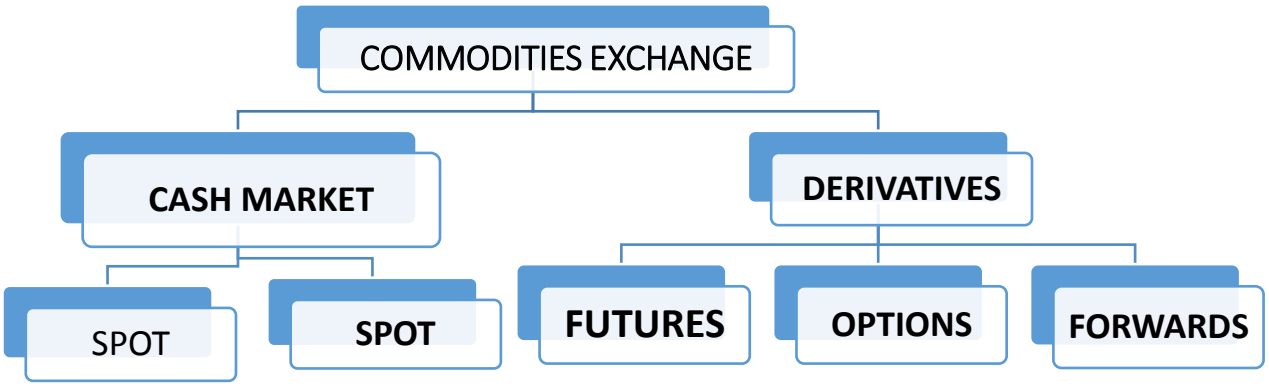

Figure 2.3: Types of Commodity Market. Source: The Technical Committee on Commodities Trading Ecosystem, (TCCTE, 2018).

2.2.6.3. Yam commodity trade in Nigeria

Nigeria produces more than 60 per cent of the entire world's yams. Yam farming offers potential income-generating activities to Nigerian farmers who can grow this versatile tuber. The sale and trading of freshly harvested yam creates business opportunities for vendors at local produce markets. In the production of yam tubers, Nigeria is by far the world's highest producer of yam and is accountable for over 76% of the world yam production. Yam is good food and has about

200 calories of energy per capita daily if consumed. The majority of the states in Nigeria are responsible for the production of yam, but more are produced in states like Benue, Oyo, Nasarawa, Sokoto, Abia, Imo, Anambra, Delta, Edo, Enugu, Ebonyi, Niger, Taraba, Osun, and Plateau (Neogric, 2023).

According to Ajibade *et al.,* (2018), yam is produced in the middle belt region, Southern and Eastern parts of Nigeria as yam production is more suitable to the soil and climate in these parts of the country hence most of the influx of yam to all other parts of the country are basically from these regions. All the yams consumed in Nigeria move from these regions to other parts of the country through trading. The yam produced from the farm gates are moved and distributed by dealers to the different parts of the country. The channel comprises of the producer/farmer, the wholesalers, the retailers and down to the final consumers. Therefore, the channel makes it possible in the supply patterns of these yams produce to the areas of demand. Improvement in the yam marketing system is the panacea for increased production, productivity and income for satisfying the utility of the consumers.

A North-South trade flow has been identified for yam marketing in the Southeastern Nigeria (Ajibade *et al*., 2018). A lot of factors have been identified to have influenced this yam trade flow in the region. Such factors are the population of the region, migration and urbanization, natural resources endowment, income, ecological differences and demand level (Anuebunwa, 2002).

2.2.6.4. Yam trade participants

Participants in yam trade according to (TCCTE, 2018**)** include brokers, dealers, broker- dealers, and clearing members. These classes of participants may be licensed to trade on their own or on behalf of their clients (farmers, merchants, exporters, agro processing companies, etc.) depending

on their membership category. The clearing members are responsible for clearing all trades on the exchange. Apart from the participants that are registered by the Exchange and the regulatory authority such as SEC in Nigeria, there are participants that are not members of the exchange but render very important ancillary services such as Warehouse Operators and Collateral Management Companies, Banks, logistic companies, etc.

In Nigeria, no agricultural commodity trade particularly yam can operate without a strong and productive farming population. Farmers are major market participants in that they help to strengthen the supply side for continuous trading activities. In the yam value chain, farmers work closely with warehouse operators to guarantee effective storage of their produce. They can also take position on the commodity exchange to profit.

More so, yam merchants receive orders for trades on the exchange. They buy from multiple smallholder farmers in periods of low prices, storing and eventually selling to large institutional buyers at higher prices in times of relative scarcity. The traders and merchants, depending on the time that the yams are sold to off-takers, usually incur storage costs. The activities of traders and merchants in the market help to mitigate the risk of farmers holding the yams for a long period. This means that farmers can get immediate value for their produce at farm gate without necessarily having to bear the cost of transportation or storage. In this system, the middle-man (trader/merchants) get the potentially reward of a higher price in return for taking the risk of holding on to the commodity (storing) over a period. While the merchant can take advantage of seasonal fluctuations in price, smallholder farmers often cannot (TCCTE, 2018).

2.2.7 Benefits of commodity exchange

There are several benefits of commodity exchange to the economy. The benefits cannot be over-emphasized. Some of which are:

i. They promote economic growth by fostering the development of tangible and intangible commodities by efficiently linking commodities to industry, which could improve industrial output and profitability; facilitate industrialization of the economy and improve tax revenue;

ii. They create employment and raise the living standard of the farming community as opportunities are provided for better access to market, produce marketing, access to market price and other important information, which could lead to improved produce prices for farmers. Since small holder farmers are usually the rural poor, improvement in their living standards can have positive impact on rural development and mitigate rural-urban migration;

iii. They can serve as a platform for small holder farmers to be brought into the financial sector as they get exposed to financial services such as bank deposit and credit facilities, thereby fostering the much-needed financial inclusion;

iv. They engender economic diversification. This is more so for an economy like Nigeria, which is heavily dependent on a single product for its foreign exchange earnings, namely crude oil. For an essentially agrarian economy like ours, with good solid mineral deposits, developing the commodities market remains a potent way to diversify the economy away from crude oil, as well as widen the national tax base. A diversified economy will potentially diversify the export base and improve government revenue;

v. They improve the attractiveness of agribusiness and foster agricultural production as farmers and end users benefit from the use of the exchange. As value is seen and derived from the exchange, more people are likely to be drawn to agribusiness. Increased production would reduce import dependence and encourage more private investment in the agricultural sector;

vi. By efficiently linking buyers and sellers in sufficient number, commodity exchanges create liquidity and facilitate price discovery, which further bolsters commodity trading. These and many more can be benefited from commodity exchange.

2.3 Empirical Literature Review

2.3.1 Socio-Economic Characteristics of Yam Traders

Okwuokenye, and Onemolease, (2011) on the influence of socio-economic characteristics of yam sellers on marketing margins among yam wholesalers in Delta State, Nigeria, revealed that yam wholesale marketing is majorly carried out by males, most of them are married and have up to secondary school qualification. The mean age was 48 years and they were all into full–time marketing of yam. The mean years of marketing experience was 9 years. The high ratio of male to female yam farmers in the study area might be due to the role of women as housewives. It may also be due to the strenuous nature of yam cultivation.

The study by Akerele *et al*., (2019) on Performance Analysis of Yam Marketing in Yewa Division of Ogun State, Nigeria, stated that the ability of the marketers to take advantage of emerging opportunities that could improve marketing efficiency and profitability could be influenced by their age. The average age was estimated at 41 years meaning that most yam marketers in the study area are in their middle age. The finding revealed that majority (65.8%) of the respondents were females. This showed that yam marketing seems solely a female business

in the area, which confirms Oladapo *et al*. (2015) and Okoedo-Okojie and Okwuokenye (2014), but disagreed with Okwuokenye and Onemolease (2011) whose study revealed that yam trading is male-dominated. The relative sole distribution may be a result of social barriers. Marital status is expected to influence respondents' level of responsibilities which could have a positive or negative influence on their disposition to economic activities including the yam marketing. The result shows that most of the yam marketers in the study area are married and therefore yam marketing would serve as a means to meet the needs of the family The result revealed that the majority of yam marketers in the study area do not have formal education. Notably, formal education is an essential tool for the adoption of effective communication system that encourages increase in the marketing of any agricultural produce. Thus, with low level of literacy in the study area, yam marketers would hardly adopt new marketing strategy which could improve their levels of profits. Analysis of the religion of the respondents revealed that majority (53.3%) of the yam marketers practiced Islam as religion while 45% of them were Christian and only 1.7% did not practice Christianity and Muslim. Substantial percentages of the two dominant religions were well represented in the study area. Experience is an important determinant of efficiency and perhaps profitability. The average experience of marketers was determined at 14 years and 6 months. This showed that the managerial ability of the marketers can be inferred to be reasonably good. Household size may determine the family labour at the disposal of a yam marketer. In terms of the household size distribution of the yam marketers, the results indicated that majority of the marketers 76.6% belong to the household size of between 5 and 8 persons. On the percentage distribution of respondents by membership of marketing association, the result showed that majority of the respondents (90.8%) subscribed to the membership of marketing

association. Those involved in Marketing Association did so because of easy access to extension services, market and credit facilities.

2.3.2 Categories of trade barriers to food commodity trade

According to Jhingan (2013), Voluntary export restraints (VERs) is an agreement by an exporter's country or government with an importing country to limit their exports to it. It is entered into by the importing country when its domestic industry is suffering from large imports. This limit to imports may be set in terms of quantity, value or market shares.

In addition, exporting subsidy is also given to an export firms or producers to reduce the price per unit of goods exported abroad. This enables the producers to sell larger quantity of commodity at a lesser price in the export market than the domestic markets.

According to Jing Ma *et al*., (2011) on Free Trade or Protection: A Literature Review on Trade Barriers, stated that quantitative measures of restriction, like tariff, are tools of national economic policy designed to regulate the international trade of a nation. Unlike tariffs, however, they impose absolute limitations upon foreign trade and inhibit market responses; this makes them extremely effective. Quantitative restrictions ordinarily take the form of import quotas that are administered by the issuance of import licenses to individual traders. Import quotas are applied in three major types throughout the world, i.e. unilateral quotas, negotiated bilateral or multilateral quotas, and tariff quotas. Import quotas are commonly regarded as restrictions on quantities, which are more efficient to limit importations.

However international trade disputes rose more easily due to frequent applying this tool of trade protection.

Furthermore, according to them, the 'Agreement on implementation of Article VI of the General Agreement on Tariffs and Trade 1994' dumping exists if the export price of the product exported

from one country to another is less than the comparable price, in the ordinary course of trade, for the product when destined for consumption in the exporting country. Dumping, therefore, is price discrimination between national markets. Although persistent dumping benefits the importing country by improving its terms of trade, governments consider all forms of dumping by foreign producers to be bad. Consequently, many governments have anti-dumping regulations that usually involve a remedial or punitive anti-dumping duty. It is widely recognized that anti-dumping regulations can easily be used for protection against foreign competition. Dumping and anti-dumping have already been significantly global issues in recent years. As a type of legal tool to maintain impartial trade within the framework of WTO, anti-dumping is frequently applied by many countries to protect domestic industries and markets.

Jing Ma *et al*., (2011) also asserted that many national governments, in a bid to promote certain domestic industries, pay subsidies to domestic producers or exporters. Subsidies may be extended in the form of outright cash disbursements, tax exemptions, preferential exchange rates, governmental contracts with special privileges, or some other favourable treatment. The granting of subsidies results in a cost advantage to the recipient, so they are an indirect form of protection. Subsidized products that move in international trade tend to nullify the protective effect of a tariff in the importing country. To reinstate the intended level of protection, the importing country may impose, in addition to the regular tariff duties, a special surtax or countervailing duty, which is generally equal to the amount of the foreign subsidy. In this matter, the landed cost to the domestic importer is raised by the amount of the subsidy granted to the foreign producer or exporter by the foreign government.

2.3.3. Effect of trade barriers on commodity trade

Researches have shown that several policies affect commodity trade. According to World Bank (2018), policy tools should be tailored to the terms-of-trade effects faced by different types of commodity exporters and importers. For all economies, strong macroeconomic frameworks that provide counter-cyclical fiscal and monetary policies, can help build buffers and allow authorities to better manage the negative economic effects of commodity price fluctuations. Agricultural exporters are likely to experience differing effects of climate change and will need to build resilience to extreme weather shocks. Policies to manage the macroeconomic impact of commodity price fluctuations, robust macroeconomic policy frameworks oriented toward longer-term sustainability offer the best protection against commodity price volatility (World Bank 2019). Key ingredients are strong fiscal frameworks, exchange rate flexibility linked to a monetary policy with credible low inflation objectives; and a regulatory system for the financial sector that deters the accumulation of excessive risks, especially from capital inflows and foreign currency debt.

According to Frankel, (2017), policies allowing varying in the short term but returning it to target over time. In contrast, for small open economies or countries with less developed financial markets, a fixed exchange rate regime can offer some advantages, especially if the central bank cannot commit credibly to an inflation target. Commodity price fluctuations often lead to substantial capital inflows, which can cause sharp movements in asset prices and credit markets and amplify business cycles in commodity exporting countries. Other policies like Macro prudential policies can be used to address vulnerabilities that arise from excessive capital inflows. Such policies could include requiring countercyclical capital buffers by financial institutions, restricting foreign currency borrowing, limiting loan-to-value ratios in housing

finance, and limiting the accumulation of short-term debt. Capital controls can also be used to limit the financial risks arising from short-term capital flows. Governments exposed to commodity price fluctuations can use market-based risk mechanisms such as futures and options contracts to limit their exposure to price movements (Benford *et al.*, 2016).

Structural policies to reduce vulnerability to commodity price fluctuations, exposure to commodity market risks is most pronounced for countries that depend on a narrow range of resource-based exports. The underlying vulnerability can be addressed only over the longer run, via structural changes in the economy and through macroeconomic policies. Economic diversification reduces the risks of terms-of-trade shocks, but direct government intervention to achieve it is seldom successful and may go against the country's comparative advantages. A more promising way forward is to establish an environment that favors innovation and investment generally. Commodity exporters also face environmental risks, and for their future prosperity they must ensure that their resources are extracted in a sustainable way. Commodity importers encounter a different set of risks. They are less subject to terms of-trade volatility from commodity price shocks than exporters because commodity concentration is much less on the import side. However, importers may face risks of accessibility to resources that commodity exporters do not. In addition, for countries that rely heavily on commodities that may be subject to downward price trends, structural policies may be needed to facilitate adjustments to new economic environments. For example, according to World Bank, (2018), low-income countries that depend on exports of agricultural products as a source of revenue may benefit from reforms that facilitate the expansion of other sectors of their economy. There is strong evidence that diversifying exports and government revenues away from commodities strengthens an economy's long-term growth prospects and resilience to external shocks. Wealth diversification

through Sovereign wealth funds according to (Boer *et al.,* 2021), have been used successfully by several countries to diversify wealth and provide stable long-term foreign income.

Agricultural Marketing Information System as intended to provide information on pricing during boom and also provide a useful forum for cooperation. Policies to moderate boom-bust cycles: use cautiously Commodity price booms and busts often lead to calls for policy measures to protect producers or consumers. For example, governments often use subsidies or trade measures to try to moderate the effects of commodity price movements on consumers. At the international level, attempts to mitigate market volatility can take the form of agreements among producers to manage supplies in order to achieve price goals. Domestic policy initiatives. Commodity price spikes can hurt households, particularly poorer households, which spend a large portion of their disposal income on food. Consumer subsidies are frequently used to protect households from destabilizing shocks (Guenette 2020).

2.3.4 Determinants of volume of commodity traded

Adesiyan, *et al.*, (2020) worked on the Determinants of farmers' willingness to export yam in Ibarapa East and Ibarapa Central Local Government Areas of Oyo State, Nigeria. Probit model was used to analyze the yam farmers willingness to export yam and the result of the Probit analysis of factors affecting farmers' willingness to export yam showed that all the variables included in the model had positive effects on the farmers' willingness to export yam suggesting that an increase of 1% of these variables will have a proportionate effect on farmers' willingness to export yam based on the value of their coefficients.

However, the level of education, family size, and exportable surplus, availability of transport facilities, government restrictions, interest rate and cost of export had negative effects on willingness to export yam in the study area. This means an increase of 1% on any of these

variables will bring about a corresponding decrease in yam farmers' willingness to export their produce. Explicitly and considering the significant variables, farm size was positive and significant at 1%. This means if the size of farmers' farm increases by 1 hectare, farmers' willingness to export will increase by 0.81 units. This confirms the a priori expectation that the larger the farm size the more willing the farmers are to export. In other words, farmers who own large farms, benefit from economies of scale, these farmers can make use of tractor instead of manual labour, and make relatively high profits enabling them to have the financial means to export and are therefore interested in the prospects of increasing their income from export since they can afford it. On the other hand, farmers with small farms are unlikely to benefit from economies of scale as such having relatively low income, therefore making export an uncompetitive venture for them.

The quantity consumed was negative and not significant. This supports the a priori expectation that the higher the quantity consumed the less willing the farmer will be to export. Concerning other variables, the availability of transport facilities and exportable surplus were negative and not significant which shows that farmers in the study area who had better access to transport facilities are unwilling to export. This contradicts the a priori expectation that the more the farmers have access to transport facilities, the more willing they would be to export. This probably can be due to the high cost involved in transportation which reduces their profit from the business. Also, it signals that when exportable surplus increases, willingness to export yam reduces.

2.3.5. Determinants of level of effect of tariff and non-tariff barriers on volume and prices of yam

Trade barriers on any agricultural commodity affect the prices. Consumers and government shift over time with price increase and volume of trade. In the short run, higher prices for yam can reduce the consumption of yam by individual consumers and also by businesses. In the long run, these traders may see a decline in efficiency due to a lack of competition and may also see reduction in profits due to the emergence of substitutes from their products. On the other hand, tariffs increase the price of commodity including yam, because of this, domestic producers are forced to reduce their prices from increase competition and the consumers are forced to buy and paying high prices as a result, there are decline purchase leading to traders losing profits (Brent, 2023).

According to Erica (2018), trade barriers have been demonstrated to cause more economic harm than benefits; they raise prices and reduce the availability of goods (yam), thus resulting to low net income. As the sellers spend more on trade barriers, the consumers also pay more and have less to spend on other household needs. According to this analysis, high prices are less production driven than caused by the high level of domestic demand, the high transaction costs from farm gate to consumers, and the restrictions affecting the profit margin of the seller.

2.3.6 Trade barriers and volume of yam trade

Regional economic communities which Nigeria is a member have developed trade policy frameworks with the objective of increasing trade integration between their member states. This process was further advanced by the abolition of tariffs or quotas on intraregional trade in domestic products especially agricultural products such as yam. In January 2015, after 10 years of negotiations, five different tariff bands of 0%, 5%, 10%, 20% and 35% were introduced.

While the first four bands were taken from the West African Economic and Monetary Union, the 35% band was added after intense negotiations, with particularly Nigeria and West African agricultural producers strongly arguing in favour of it, to protect sensitive products. Ninety percent of the products in the 35% band are agricultural goods, while no agricultural products are in the 0% band. As such, agriculture is relatively more protected than other sectors. A notable exception is rice, which is in the 10% tariff band, implying that the interests of rice consumers (low price) prevailed over those of rice producers (De Roquefeuil *et al,* 2014).

Several studies have revealed that widespread nature of bribery in the region, in particular the prevalence of corrupt customs procedures and road harassments. These border bribes and roadblocks lead to long and costly delays (World Bank, 2015). Such corruption is a way of rent-seeking by officials (e.g. custom officers, police) and others (e.g. communities through which a road passes). Social acceptance of such practices and weak enforcement mechanisms facilitate this rent-seeking. Intra-regional trade is further hampered by the high costs of moving yams by road or rail within the Northern States to the South East states, as a result of poor infrastructure and management of the transport sector. This especially affects producers and traders in rural areas to move their yams. Transport prices per ton kilometer from farm gate to primary collection markets tend to be three to five times higher than those from secondary (often rural wholesale) markets to wholesale markets located in the regions. This, however, has negatively affected market access, which is determined by the geographic distance between producers and consumers. As population increases and consumption patterns increasingly shift towards more perishable and higher value products, the state of the connecting systems (roads), communication and market infrastructure and transport become critical, especially since a growing share of the

population is located far away and hence becomes difficult connecting to the people living in the hinterland (FAO and AfDB, 2015).

The poor state of physical market infrastructure for efficient product aggregation and post-harvest handling, including storage, sorting, grading and packaging of agricultural produce have become worrisome in handling yam trade. In South East states, marketing infrastructure are generally insufficient to cope with the burgeoning demand and supply of yam as more and more consumers rely on the market for their food. This infrastructure gap tends to be largest in rural areas. As a result, buyers face high transaction costs for product aggregation, quality control, and sorting into batches of homogenous quality. In addition, quality deterioration and spoilage is also serious problem, especially for perishable products such as fruits, vegetables, yam and animal products and many more. These official and unofficial barriers have drastically affected the ease of yam flow into the south east states.

2.4 Analytical Literature

2.4.1 Ordinary Least Squares Regression Model

The OLS is a regression estimate of models to test the relative and global statistics. Ordinary Least Squares regression (OLS) is a common technique for estimating coefficients of linear regression equations which describe the relationship between one or more independent quantitative variables and a dependent variable (simple or multiple linear regression). The model can be extended to include multiple explanatory variables by simply adding additional variables to the equation. The form of the model is the same as above with a single response variable (Y), but this time Y is predicted by multiple explanatory variables (X_1 to X_2). $Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$. The interpretation of the parameters (α and β) from the above model is basically the same as for the simple regression model above, but the relationship cannot now be graphed on a single

scatter plot. α indicates the value of Y when all vales of the explanatory variables are zero. Each β parameter indicates the average change in Y that is associated with a unit change in X, whilst controlling for the other explanatory variables in the model. Model-fit can be assessed through comparing deviance measures of nested models. The model can be express in four functional forms,

(i) Linear functional form, the functional form is expressed as;

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_n X_n \quad \text{(Equ 2.1)}$$

(ii) Exponential functional form, this functional form is expressed as follows;

$$LnY = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_n X_n. \quad \text{(Equ 2. 2)}$$

(iii) Semi-Long functional form, this functional form can be expressed as follows;

$$Y = \alpha + \beta_1 LnX_1 + \beta_2 LnX_2 + \beta_3 LnX_3 + \beta_n Ln\, X_n \quad \text{(Equ 2.3)}$$

And; (iv) Double-Log functional form, this functional form is expressed as follows;

$$LnY = \alpha + \beta_1 Ln\, X_1 + \beta_2 Ln\, X_2 + \beta_3 Ln\, X_3 + \beta_n Ln\, X_n \quad \text{(Equ 2.4)}$$

According to Eliot, *et al.,* (2012), this statistic measures the relationship between or among variables in a model. It tells us the direction of variables between or among dependent and independent variables. The model also shows the magnitude of the independent variables in relation to the dependent variable, i.e., how a unit change in independent variable can affect quantity change in the dependent variable.

It tests the significance of the individual variables especially the independent variables.

Lee Chin and Ahmad Khusyairi Bin Che Rusli (2015) state that to estimate the determinants of non-tariff barriers, the basic cross-sectional regression thus becomes the following:

$$NTB_{t+1} = \alpha + SIZE_t + UNEM_t + TARIFF_t + POLITIC_t + REER_t + VYO + U_t \quad \text{(Equ 2. 5)}$$

Where NTB is non-tariff barriers;

UNEM is the unemployment rate;

TARIFF is a weighted mean-applied tariff;

POLITIC is number of parliamentary seats (proxy for political institutions);

REER is the real effective exchange rate;

SIZE is the economic size. Four proxies, namely, national GDP, ratio of national GDP to global GDP, ratio of national imports to total global imports and imports as a percentage of GDP are used to measure relative size. Thus, we estimate equation (5) using these four variables one at a time. The dependent variable, NTB_{t+1}, is used to indicate that the NTB will be implemented one year after a country experienced macro-economic fluctuations at time t.

Studies like those by Ude and Agodi (2015), Gemelee (2019). and Saksena and Anderson (2008) have shown that NTBs are governed by economic size. Intuitively, relatively large economies are likely to possess greater market power. Large states can exercise their power through the use of TBs or NTBs with little fear of retaliation from smaller states. In contrast, smaller states depend more on the international economy and trade, and therefore, are less likely to employ NTBs. Hence, it is expected that the relationship between economic size and NTBs is a positive one. Chin and Che Rusli (2015) noted that the ratio of a country's GDP to world GDP is a useful indicator of economic size, and further argued that a country's absolute GDP also provides an effective measure of its economic size.

In addition, they also included imports ratio in their model. Because imports ratio further determines the dependence of an economy on international trade. As mentioned earlier, countries that are more dependent on international trade are less likely to employ NTBs than are those countries that are more self-reliant.

2.4.1.1 Grossing –up Technique

This technique was used by Minde and Nakhum (1998). The adopted grossing-up technique assumed that trade volumes in the non-monitored days were reflected in the trade volumes recorded during the border monitoring days. Thus, the uprating formula used for grossing-up the trade volumes for each month of the survey is of the form of $Yi = (X_i / 7) * N_i$ for i = 1, 2….12. Where Y_i represents the total volume of yam traded in ith month, X_i represents the total volume of yam traded in the 7 days in which the local borders and inter-state borders was monitored for ith month, and N_i is the number of days in ith month where there are movement of yam. In order to adjust the trade data to accommodate the fact that movements of yam in the night were not covered by the monitors, and the fact that it was practically impossible to capture fully Intra Cross-Border Trade (ICBT) in the day, coverage index was solicited from the monitors. This phenomenon is not strange when conducting ICBT, as the studies conducted for Mozambique and Malawi showed that 65 per cent and 60 per cent of the trade volumes were captured in the countries, respectively. The coverage index arrived at for each of the borders after extensive discussions with field monitors, stakeholders at the borders and the field supervisors.

Intra Cross-Border Trade Index or Coverage index can be estimated as follows;

$$\mathbf{CI} = \frac{\textbf{Total quantity of yam moved from one border to another in ith month}}{\textbf{Number of days/times in ith month where Yam moved from one border to another border}}$$

2.4.1.2 Decision Rule for Durbin-Watson

If Durbin-Watson test falls into the rule of the thumb (between 2.0 and 4.0), there is no presence of first order serial correlation. Hence the variables are significant (Dickey and Fuller, 1979). However, if it falls below 2.0 e.g., 1.5 — 1.9, it shows there is weak presence of serial correlation but can be ignored.

2.4.2 Granger Causality Test

According to Granger and Newbold (1986), granger causality test measures the impact, effect or influence of one variable on the other.

Causality test shows the direction of effect and also measures the short and long run economic problem(s) so as to enable policy makers know which of the economic policies is to be implemented at one point or the other.

The directions in Granger causality are:

a) Unidirectional

b) Bi-Directional

c) Non-Directional

It is unidirectional if one variable granger causes the other. It is bi-directional if both variables granger cause each other. It is non-direction if none of the variables granger causes each other. If it is unidirectional it is said to be short term economic problem. If it is bi-directional it is said to be a long-term economic problem.

The granger model for testing the causality effect of trade barriers on cost of the volume of yam traded is specified below;

$$TBs_t = \sum_{i=1}^{n} \alpha_i VOYT_{t-i} + \sum_{i=1}^{n} \beta_j CC_{t-j} + \sum_{i=1}^{n} \beta_j IC_{t-j} + \sum_{i=1}^{n} \beta_j CT_{t-j} + IBC + \mu_{1t} \quad \text{(Equ 2.6)}$$

$$VOYT_t = \sum_{i=1}^{n} \beta_j P_{t-j} + \sum_{i=1}^{n} \beta_j QD_{t-j} + \sum_{i=1}^{n} \beta_j PS_{t-j} + \sum_{i=1}^{n} \beta_j GP_{t-j} + \mu_{2t} \quad \text{(Equ 2.7)}$$

Where TB = Tariff Barriers (1= Tariff Barrier, 0 = Non-Tariff Barriers);

VOYT = Volume of yam traded (Naira);

CC= Custom Charges (Naira);

IC = Immigration Charges (Naira);

CT = Commodity Tax (Naira);

IBC = Intra Border Charges (Naira);

P = Price of yam (Naira)

QD= Quantity demanded (Tons);

PS = Population size (Number of people);

GP = Government policies on yam trade (1 = Yes, otherwise, No).

μ= Error term.

2.4.2.1 Test Hypothesis for Granger Causality Test

H1: P does not Granger cause Q.

In testing causality relationship between non trade barriers and food commodity trade/flow, granger causality model was used to achieve this relationship. To evaluate causality between the two variables of the model we use the VAR model derived from the long-run co-integration relationship. The VAR model is utilized to test the hypothesis that one variable does not Granger cause the other variable. The null hypothesis is that TBs_t does not Granger cause $VOYT_t$ and vice-versa.

$$TBs_t = \sum_{i=1}^{n} \alpha_i VOYT_{t-i} + \sum_{i=1}^{n} \beta_j CC_{t-j} + \sum_{i=1}^{n} \beta_j IC_{t-j} + \sum_{i=1}^{n} \beta_j CT_{t-j} + IBC + \mu_{1t} \quad \text{(Equ 2.6)}$$

$$VOYT_t = \sum_{i=1}^{n} \beta_j P_{t-j} + \sum_{i=1}^{n} \beta_j QD_{t-j} + \sum_{i=1}^{n} \beta_j PS_{t-j} + \sum_{i=1}^{n} \beta_j GP_{t-j} + \mu_{2t} \quad \text{..(Equ 2.7)}$$

Where TBs_t and $VOYT_t$ are the tariff barriers and total food commodity trade in a simultaneous manner. The most common way to test the causal relationships between two variables is the Granger-Causality proposed by Granger (1969).

2.4.2.2 Decision Rule for Granger Causality Test

If the P-values of the F-Statistics is less than the critical value it implies that granger causes Q by accepting H1. However, if the probability of F-Statistics is greater than the critical value, we accept H0 and conclude that P does not granger cause Q. Our interest is in H1, i.e. (Granger Cause).

2.4.3 Profitability index model

The **profitability index** (PI), alternatively referred to as value investment ratio (VIR) or **profit investment ratio** (PIR), describes an index that represents the relationship between the costs and benefits of a proposed project

Net profit figures per enterprise tend to ignore the inter-related nature of enterprises and are thus less useful for organic systems. They are of most use where a farm has one core enterprise (Firth, 1999) and the other enterprises are minor or could be thought to contribute to that core enterprise. One alternative is to apportion only the more easily allocatable costs, such as those related to field operations in crop production, to arrive a net margin per crop/enterprise. This technique has been adopted in a number of studies investigating the economics of organic farming. This overcomes to some extent, the limitations of gross margins, which fail to take account of fixed costs changes when comparing conventional with organic farming. The difficulties of using net margins are that; firstly, there are few if any published 'standards' with which to compare. Secondly costs of field operations are not accurately recorded on all farms, therefore they rely on estimates that may vary from farm to farm, which can cause problems when farm comparison is made. This was overcome in a number of studies by using contractor's charges to arrive at the costs of various operations. Finally, net margins and net profit per enterprise are less appropriate for farm planning, since the fixed costs elements are unlikely to

vary directly in proportion to the size of the enterprise. The profitability index model is stated as according to Chidiebere-Mark, (2017);

Profitability = NI / TC equ 2.8

Where;

NI = Net income

TC = Total cost

TC = FC+VC

FC = Fixed Cost (Naira);

VC = Variable Cost (Naira).

CHAPTER THREE

METHODOLOGY

3.1 Study Area

This study was done in South East of Nigeria. The region lies between latitude 4° 47′ 35″ N to 7° 7′ 44″ N and longitudes 7° 54′ 26″ E to 8° 27′ 10″ E (Olumba *et al*., 2021). The southeast region is made up of five states, namely, Abia, Anambra, Ebonyi, Enugu, and Imo States with eighty-five (85) Local Government Areas (LGAs). The region had a population of 16,395,555 people according to the 2006 census (National Population Commission, NPC, 2006), and an estimated population of 22,012,828 people (NPC, 2021). The region has a total land area of 33,664 km^2 (National Bureau of Statistics, NBS, 2019). The zone is bounded by the River Niger on the West, the riverine Niger Delta on the South, the flat North Central to the North, and the Cross River on the East. Agriculture is the mainstay of economic activities for the majority of rural communities. Apart from agriculture, the zone is also known for its commerce and trading activities with a preponderance of micro, small, and medium indigenous industries that are into manufacturing, fabrication, and agro-allied produce. Agriculture thrives very well in the area because the zone is endowed with arable land. The main food cultivated in the zone are, cassava, rice, yam, cocoyam, and maize while the cash crops include oil palm, rubber, cocoa, banana, and various types of fruits. The zone is blessed with solid minerals and natural resources in rich deposits such as crude oil, natural gas, bauxite and iron ore, sandstone, lignite, kaolin, clay, coal, tin, columbite, etc. Farmers in the region produce food crops such as yam, cassava, groundnuts, maize, cocoyam, plantains, vegetables, banana, beans, and rice and cash crops such as oil palm, pea, star apple, mango, and avocado. Livestock farmers in the region rear poultry, pigs, sheep, goat, rabbits, and many more. The region is selected for this research because of its contribution to the total yam produced in the country as it is one of the major yam producers in Nigeria and it

contributes to the GDP of Nigeria through its export activities of food commodities, especially yam.

3.2 Sample Selection

Multi-stage, purposive, and random sampling techniques were used to select data for this study. In the first stage, three (3) states were purposively selected from the five states that make up the southeast zones. This selection was made due to the proximity. The states were Abia, Anambra, and Imo states.

In the second stage, two Local Government Areas (LGAs) each were purposively selected from the three states, making a total of six (6) LGAs. They were Aba South, Umuahia North, Onitsha North, Awka South, Owerri Municipal, and Aboh Mbaise. These LGAs produce and market yams more than other local government areas.

In the third stage, two (2) major markets were also purposively selected from the six (6) LGAs, making a total of twelve (12) markets that were studied for yam trading. These were the predominant markets in the areas. These were; the Ahia Ohuru market, the Ekeoha market, the Eke Umuahia and the Ubani market in Abia state; the Onitsha main market, the Ochanja market, the Eke Awka market, the Nkwo Amaenyi market of Anambra state; and the Ekeukwu Owerri, the Relief Market, the Afor Enyiogugu market and the Afo Ajala market in Imo state respectively.

In the final stage, ten (10) yam sellers were selected randomly from the lists of registered yam sellers in the twelve (12) markets selected from the local government areas making a total of one hundred and twenty (120) yam sellers in the study area. The 120 yam sellers formed the sample size for this study.

3.3 Method of Data Collection

The study used primary data. A total of 120 questionnaires were distributed to yam traders in the study area during face-to-face visits by the researcher. After filling; the questionnaire was then returned to the researcher who used them for analysis.

The instrument was divided into sections to correspond to the objectives of the study.

3.4 Methods of Data Analyses

Descriptive statistics, ordinary least square multiple regression (OLS), and profit models were used to analyze the data. The data were first analysed on a state-by-state before being combined and analysed collectively for all selected states in the southeast.

Objectives (i), (ii), and (iv) are to describe the socioeconomic characteristics of the yam traders in the study area, characterize the barriers to yam trade in the south-east, Nigeria and describe the extent to which trade barriers affected the volume of yam traded in the study area was achieved respectively using descriptive statistics.

The trade barriers were categorized under tariff barriers and non-tariff barriers and each category was used to describe the effects examined on the yam trade respectively. The mean value and standard deviation of the categories of tariff barriers (TBs) and non-tariff barriers (NTBs) were estimated, and the mean value was used to determine the extent.

Decision Rule

μ (mean) = 4.0 - 5.0, the extent of trade barriers on the volume of yam is Medium Effect (ME),

μ (mean) = 5.0 – 6.0, the extent of trade barriers on the volume of yam is High Effect (HE),

μ (mean) = 6.0 and above, the extent of trade barriers on the volume of yam is a Very High Effect (VHE), and

μ (mean) < 4.0, the extent of trade barriers on the volume of yam is Low Effect (LE).

Objective (iii) which is to determine the effect of trade barriers along category lines vis-vis TBs and NTBs on yam trade in the study area was achieved using ordinary least squares multiple regression analysis. The model as used by Afolabi et al. (2017) is remodeled and implicitly expressed as VOYT = *f* (TBs, NTBs, ε) and explicitly expressed as follows;

$VOYT_{TB} = \beta_0 + \beta_1 P + \beta_2 Q_D + \beta_3 P_C + \beta_4 Tg + \beta_5 M_C + \varepsilon$ - - -equ(3.1)

$VOYT_{NTB} = \beta_0 + \beta_1 P + \beta_2 Q_D + \beta_3 R_B + \beta_4 I_C + \beta_5 S_E + \varepsilon$ - - - equ(3.2)

Where *i* refer to the ith barrier.

VOYT = Volume of yam traded (Tons)

P = Price of yam (Naira)

Q_D = Quantity demanded (Tons);

P_C = Produce Charges (Naira);

R_B = Roadblocks (Number of roadblocks mounted)

I_C = Illegal charges (Naira);

S_E = Security (Amount paid in naira)

Mc = Municipal charge (Naira)

Tg = Tollgate charge (Naira)

β_0 = constant term

β_1 - β_5= are coefficients to be estimated

ε = error or residual term.

Equations 3.1 and 3.2 were both fitted for both TBs and NTBs respectively.

Objective (v) which is to estimate the profitability of yam traders in the study area was achieved using the profitability model. Profitability measures such as net return analysis as used by Nse-Nelson *et al*. (2017). The formula used in this research is as follows;

MM (₦) = SP_i – (PC_i + MC_i) - - -equ(3.3)

MC_i = Total marketing cost incurred by the ith yam trader (₦).

SP_i = Selling price of the ith yam trader (₦).

PC_i = Purchasing cost of the ith yam trader (₦)

The model is specified as follows

$\Pi = \frac{MM}{MC}$ - - - equ(3.4)

Where

MM= Marketing Margin (₦) = SP_i – (PC_i + MC_i)

MC_i = Total marketing cost incurred by the ith yam trader (₦)

Decision Rule

If the profitability ratio is equal to 1, yam trade is profitable

If the profitability ratio is greater than 1, yam trade is highly profitable

If the profitability ratio is less than 1, yam trade is not profitable.

Objective (vi) which is to determine the effect of TBs and NTBs on the profit of the yam traders in the study area was achieved using multiple regression analysis. Four functional forms of linear, exponential, double log and semi-log functional forms will be fitted. The model that expresses the highest value of the coefficient of multiple determination R^2, the highest value of F-statistics and the highest numbers of significant variables according to a-priori expectation was chosen to explain the effect on profit. The model is expressed explicitly as;

$\pi_{TB} = \beta_0 + \beta_1 P + \beta_2 Q_D + \beta_3 P_C + \beta_4 Tg + \beta_5 M_C + \varepsilon$ …equ(3.5)

$\pi_{NTB} = \beta_0 + \beta_1 P + \beta_2 Q_D + \beta_3 R_B + \beta_4 I_C + \beta_5 S_E + \varepsilon$ - - - equ(3.6)

(Afolabi *et al*. 2017)

π = profit (MM)(₦) = $SP_i - (PC_i + MC_i)$ - - -equ (3.7)

Where;

MC_i = Total marketing cost incurred by the ith yam trader (₦).

SP_i = Selling price of the ith yam trader (₦).

PC_i = Purchasing cost of the ith yam trader (₦)

Where *i* refers to ith trader.

π = profit/Marketing Margin (naira)

P = Price of yam (Naira)

Q_D = Quantity demanded (Tons);

P_C = Produce Charges (Naira);

R_B = Roadblocks (Number of roadblocks mounted)

I_C = Illegal charges (Naira);

S_E = Security (Amount paid in naira)

Mc = Municipal charge (Naira)

Tg = Tollgate charge (Naira)

β_0 = constant term

β_1 - β_5= are coefficients to be estimated

ε = error or residual term.

3.5 Test of Hypotheses

Hypothesis 1 which stated that the effect of trade barriers will be negative and significantly related to volume of trade was tested using the results of regression analysis of objective (iii). Significant variables of TBs and NTBs were accepted and used to explain the effect on the volume of yam traded.

Hypothesis II, which stated that TBs and NTBs do not have significant differences on the profit of yam traders was tested using Z statistics

$$Z = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}} \quad \text{---equ (3.8)}$$

where,

Z = Statistic value for judging the significant difference in the two samples

$\bar{X}_1$ = mean net profit of yam traders under tariff barrier

$\bar{X}_2$ = mean net profit of yam traders under non-tariff barriers

S_1^2 = variance of net profit of yam traders under tariff barriers

S_2^2 = variance of net profit of yam traders under non-tariff barriers

n_1 = sample size of yam traders on tariff barriers

n_2 = sample size of yam traders on non-tariff barriers

CHAPTER FOUR

RESULT AND DISCUSSION

4.1 Socio-Economic Characteristics of Yam Traders in South East Nigeria.

The traders' socioeconomic characteristics such as age, sex, marital status, level of education, household size, years of trading experience, yam source, and quantity traded were analyzed and discussed.

4.1.1 Age Distribution of the Yam Traders

Table 4.1 below shows the age distribution of yam traders in the region. The average ages were 46 in Anambra, 47 in Abia, and 46 in Imo, suggesting that young traders dominated the yam trade.

In Abia, 55% of traders were between 47 and 57 years, while 43% in Anambra and 40% in Imo were aged 36 to 46. Overall, 38% of traders across all states are in the 36 to 46 years bracket. Abia has the highest proportion of traders with an average age of 47 years, followed by Anambra and Imo.

These results highlight the strong involvement of young individuals in yam trading, especially in Abia. This aligns with findings from Akintunde *et al*. (2022), which indicated that yam marketers typically have a mean age of 40 years, showing they are in their active ages and ready to contribute actively to agricultural marketing.

Table 4.1. Distribution of the respondents based on Age

ABIA STATE			ANAMBRA			IMO			POOLED STATES		
Age (years)	**Frequency**	**Per cent**	**Age (years)**	**Frequency**	**Per cent**	**Age (years)**	**Frequency**	**Per cent**	**Age (years)**	**Frequency**	**Per cent**
25 – 35	3	7	25 – 35	6	15	25 – 35	6	15	25 – 35	15	13
36 – 46	13	33	36 – 46	17	43	36 – 46	16	40	36 – 46	46	38
47 - 57	22	55	47 - 57	9	22	47 - 57	11	28	47 – 57	42	35
58 – 68	2	5	58 – 68	8	20	58 – 68	7	17	58 – 68	17	14
Total	**40**	**100**		**40**	**100**		**40**	**100**		**120**	**100**
Mean		**47**			**46**			**46**			**47**

Source: Field Survey Data, 2024

4.1.2 Distribution of the Yam Traders by Sex

The distribution of the yam traders by sex in the study area is presented in Table 4.2.

The result showed that male yam traders dominated yam trading in Abia and Anambra states with equal gender representation for Imo State. In Abia, most of the traders were male, making up 78% of the group, while females accounted for just 22%. Anambra had a more balanced proportion, with 55% male and 45% female traders. In Imo, the gender split was equal, with both men and women representing 50% of the trading population. Overall, across all the states, 61% of traders were male, while 39% were female. The result implied that yam trading in the study area was primarily male-dominated and, this is not surprising due to the cultural and religious background of most communities in Nigeria that still put women's enterprises under their husbands' care as a form of submission. The finding of Ayisi and Krisztina (2022) reveals that while both males and females engage in diverse agricultural activities, gender-specific roles in agricultural decision-making prevail. While the males engaged in inter-state yam trading, the females concentrated their agricultural activities around the homestead primarily because of their domestic and reproductive roles.

However, the result of Imo State agreed with Akintunde *et al*. (2019) who reported that women are competing with the men in agricultural marketing.

Table 4.2. Distribution of the respondents based on their Sex

ABIA STATE			ANAMBRA			IMO			POOLED STATES		
Sex	**Frequency**	**Per cent**	**Sex**	**Frequency**	**Per cent**	**Sex**	**Frequency**	**Per cent**	**Sex**	**Frequency**	**Percent**
Male	31	78	Male	22	55	Male	20	50	Male	73	61
Female	09	22	Female	18	45	Female	20	50	Female	47	39
Total	**40**	**100**		**40**	**100**		**40**	**100**		**120**	**100**

Source: Field Survey Data, 2024

4.1.3 Distribution of Yam Traders based on their Marital Status

The marital status distribution of the yam traders in the study area is shown in Table 4.3 below:

The findings revealed that a significant proportion of yam traders in the region were married: 68% in Abia, 80% in Anambra, and 70% in Imo. Overall, 73% of traders across Southeast Nigeria were married. Anambra had the highest proportion of married traders, followed by Imo and then Abia. This indicated that many yam traders were balancing their businesses with family responsibilities. This situation could have three important economic implications;

First, larger family sizes often mean more mouths to feed leading to increased home consumption of the yam product and reduced returns on capital investments. Second, having more family members creates an opportunity for additional labor, which can be effectively utilized in yam trading and distribution. Lastly, for some female traders, marriage and family obligations can complicate decision-making in their business, making it challenging to handle larger quantities of yam. This could, in turn, limit the scale of their businesses.

According to Akintunde *et al*, (2022), marriage remains a valued culture in the study area. The higher percentage of married people is because they derived an appreciable level of income which enhances productivity from yam production and marketing. With the growing commercialization, married people work more hours than unmarried ones, working not only on non-cash food crops but also on non-food cash crops but some socio-cultural barriers limit their participation in decision-making. Decision-making is a key factor for them to negotiate their interests and ensure access to the resources and benefits of commercial agricultural engagement.

Table 4.3 Distribution of the Respondents according to Marital Status

ABIA STATE			ANAMBRA			IMO			POOLED STATES		
Marital Status	**Frequency**	**Per cent**	**Marital Status**	**Frequency**	**Per cent**	**Mariatal Status**	**Frequency**	**Per cent**	**Marital Status**	**Frequency**	**Per cent**
Single	2	5	Single	1	2	Single	2	5	Single	5	3
Married	27	68	Married	32	80	Married	28	70	Married	87	73
Divorced	5	12	Divorced	7	18	Divorced	2	5	Divorced	14	12
Widowed	6	15	Widowed	0	0.00	Widowed	8	20	Widowed	14	12
Total	**40**	**100**		**40**	**100**		**40**	**100**		**120**	**100**

Source: Field Survey Data, 2024

4.1.4 Level of Education Attainment

The distribution of the respondents based on their level of education attainment is presented in Table 4.4

It could be seen from the result that a large proportion of the traders in the study area had secondary education: 50.00% in Abia State, 42.00% in Anambra, and 70.00% in Imo State. Overall, 54% of the yam traders in the study area had secondary education. This showed that a higher proportion of yam traders across the three States were educated but Imo State had the highest proportion among the states. The high proportion of traders with secondary education in the area implied that the traders are very knowledgeable. Educated traders will have a higher level of awareness and flexibility towards adopting new trading techniques and policies. This agreed with the findings of Oguniyi, *et al.* (2023) that educated traders may be better equipped to adopt modern marketing strategies to improve efficiency in the Yam supply chain.

Table 4.4 Distribution of the Respondents according to Levels of Education

ABIA STATE			ANAMBRA			IMO			POOLED STATES		
Education Level	**Frequency**	**Per cent**	**Education Level**	**Frequency**	**Per cent**	**Education Level**	**Frequency**	**Per cent**	**Education Level**	**Frequency**	**Per cent**
No Formal	2	5	No Formal	5	12	No Formal	2	5	No Formal	9	8
Primary	5	12	Primary	6	15	Primary	2	5	Primary	13	11
Secondary	20	50	Secondary	17	43	Secondary	28	70	Secondary	65	54
Tertiary	13	33	Tertiary	12	30	Tertiary	8	20	Tertiary	33	27
Total	**40**	**100**		**40**	**100**		**40**	**100**		**120**	**100**

Source: Field Survey Data, 2024

4.1.5 Distribution of Respondents Based on Household Size

The distribution of the respondents based on their household size is presented in Table 4.5 below:

The result showed that traders in the study area had an average household size of 5 persons per household. 53%, 58%, and, 65% of the yam traders in Abia, Anambra, and Imo states respectively, maintained a household of 1 to 5 persons per house. Correspondingly. 58%, of the households in Southeast, Nigeria kept a household size of 1 to 5 persons per house. This implied that the zone had traders with relatively small households. Smaller household sizes could mean increased revenue generation in the region due to reduced consumption expenses.

This finding contrasts with the work of Kalu and Mbanasor (2023), who reported that larger household sizes are advantageous for providing family labor and enhancing productivity. The present result implies that, in this context, smaller households may still achieve economic efficiency despite having fewer family labor resources.

Table 4.5: Distribution of Traders based on Household Size

ABIA STATE			ANAMBRA			IMO			POOLED STATES		
Household Size	**Freq**	**Per cent**	**Household Size**	**Freq**	**Per cent**	**Household Size**	**Freq**	**Per cent**	**Household Size**	**Freq**	**Per cent**
1 - 5	21	53	1 - 5	23	58	1 - 5	26	65	1 - 5	70	58
6 – 10	18	45	6 – 10	16	40	6 – 10	14	35	6 – 10	48	40.00
11 - 15	01	2	11 - 15	01	2	11 - 15	00	0	11 - 15	2	2
Mean		**6 Persons**	**Mean**		**5 persons**	**Mean**		**5 persons**	**Mean**		**5.0 Persons**
Total	**40**	**100**		**40**	**100**		**40**	**100**		**120**	**100**

Source: Field Survey Data, 2024

4.1.6 Distribution of Respondents Based on Years of Trading Experience

The distribution of the respondents based on their years of trading experience is presented in Table 4.6

The results show that 55% of traders in Abia had 11 to 20 years of experience, while 38% in Anambra had the same range. In Anambra, 48% had 1 to 10 years of experience, and 45% of pooled traders also fell within the 11 to 20 years category. The average trading experience was 13 years, 15 years, and 12 years in Abia, Anambra and Imo states respectively. Overall, in Southeastern Nigeria, the average trading experience is 13 years. This meant that Anambra had the highest proportion of experienced yam traders in Southeast Nigeria, suggesting that they possess strong managerial skills.

Table 4.6: Distribution of Traders based on Trading Experience

ABIA STATE			ANAMBRA			IMO			POOLED STATES		
Trading Experience	**Frequency**	**Per cent**	**Trading Experience**	**Frequency**	**Per cent**	**Trading Experience**	**Frequency**	**Per cent**	**Trading Experience**	**Frequency**	**Per cent**
1 - 10	15	38	1 - 10	15	38	1 - 10	19	47	1 - 10	49	41
11 – 20	22	55	11 – 20	15	38	11 – 20	17	43	11 – 20	54	45
21 - 30	03	7	21 - 30	08	20	21 - 30	02	5	21 - 30	13	11
31 - 40	00	0.00	31 – 40	02	4	31 - 40	02	5	31 - 40	04	3
Total	**40**	**100**		**40**	**100**		**40**	**100**		**120**	**100**
Mean		**13 Years**			**15 Years**			**12 Years**			**13 Years**

Source: Field Survey Data, 2024

4.1.7 Distribution of Respondents Based on the Sources of Yam

The distribution of the respondents based on where they source their yam is presented in Table 4.7 below:

The result showed that the majority (84%) of the yam traders in the South East sourced their yams from Benue State. 85% of traders in Abia state, 80% from Anambra state, and 87% from Imo state, all sourced their yam from Benue state. Imo State is seen to have the highest proportion of traders who sourced their yams from Benue State. Across the states, 3% of the respondents sourced their products from Delta State, 5% from Ebonyi State, and about 8% from Edo State respectively. The implication is that the traders would have to face several trade barriers before their products get to them. This could generally increase the trading costs and affect their profits. Karugia *et al*, (2008), reported that trade barrier cost acted as an impediment to trade in terms of increasing transfer costs and/or increasing the time required for trade over the normal amount of time needed.

Table 4.7: Distribution of Traders based on Yam Source

ABIA STATE			ANAMBRA			IMO			POOLED STATES		
Yam Source	**Frequency**	**Per cent**	**Yam Source**	**Frequency**	**Per cent**	**Yam Source**	**Frequency**	**Per cent**	**Yam Source**	**Frequency**	**Per cent**
Benue	34	85	Benue	32	80	Benue	35	87	Benue	101	84
Ebonyi	05	12	Edo	07	17	Ebonyi	01	3	Ebonyi	06	5
Delta	01	3	Delta	01	3	Delta	02	5	Delta	04	3
						Edo	02	5	Edo	09	8
Total	**40**	**100**		**40**	**100**		**40**	**100**		**120**	**100**

Source: Field Survey Data, 2024

4.1.8 Distribution of Respondents Based on the Volume of Yam Traded

The distribution of the respondents based on the volume of yam traded is presented in Table 4.8 below:

The result showed that Abia State (55%) and Anambra State (58%) had the highest proportions of yam traders dealing in 0.1 to 1.5 tons of yam, while Imo State (45%) majorly traded between 1.51 to 2.91 tons. Overall, 52% of yams traded in the South East were between 0.1 to 1.5 tons, suggesting a significant quantity of yams being traded across the region.

The mean volume of yam traded was 1.7 tons in Abia State, 1.7 tons in Anambra State, and 1.9 tons in Imo State, with Imo State leading in trading volume per month. This implies that, on average, traders are moving approximately 1.8 tons of yam each month. However, any challenges arising from trade barriers could significantly affect the volume of yam traded in the region.

According to Okoedo-Okojie and Okwuokenye (2016) and Bergh *et al*, (2012), both tariff and non-tariff barriers pose considerable challenges to Yam trade. Tariffs increase costs and protect local markets, reducing trade volumes, while non-tariff barriers introduce operational inefficiencies that further constrain yam trading volume.

Table 4.8: Distribution of Traders based on Volume of Yam Traded/Month

ABIA STATE			ANAMBRA			IMO			POOLED STATES		
Volume Traded	**Frequency**	**Per cent**	**Volume Traded**	**Frequency**	**Per cent**	**Volume Traded**	**Frequency**	**Per cent**	**Volume Traded**	**Frequency**	**Per cent**
0.10 – 1.50	22	55	0.10 – 1.50	23	58	0.10 – 1.50	17	43	0.10 – 1.50	62	52
1.51 – 2.91	12	30	1.51 – 2.91	08	20	1.51 – 2.91	18	45	1.51 – 2.91	38	32
2.92 – 4.32	05	12	2.92 – 4.32	07	18	2.92 – 4.32	03	7	2.92 – 4.32	15	12
4.33 – 5.73	01	3	4.33 – 5.73	02	5	4.33 – 5.73	02	5	4.33 – 5.73	05	4
Total	**40**	**100**		**40**	**100**		**40**	**100**		**120**	**100**
Mean		**1.68(‘000kg)**			**1.7(‘000kg)**			**1.86 (‘000kg)**			**1.78(‘000kg)**

Source: Field Survey Data, 2024

4.2. Categorization of Trade Barriers to Yam Trading in South East Nigeria

The result of the categories of trade barriers to yam trade is shown in Table 4.9 below.

The result showed that trade barriers were categorized into tariff barriers (TBs) and non-tariff barriers (NTBs) with their associated costs.

Tariff Barriers: - For **Abia State,** the TB costs include tollgate (₦15,306.3, 52%), produce charge (₦10,125, 34%), and municipal permit (₦4,262.5, 14%). **Anambra State's** costs include tollgate (₦13,173.8, 51%), produce charge (₦7,392.5, 28%), and municipal permit (₦5,380, 21%). **Imo State:** Higher costs were observed with tollgate (₦18,493.8, 55%), produce charge (₦10,931.3, 32%), and municipal permit (₦4,480, 13%).

The pooled data for the states indicated tollgate costs (₦46,973.9; 53%), produce charges (₦28,448.8; 32%), and municipal permits (₦14,122.5; 15%). It could be seen that Imo state and Abia States had more tollgate and produce charges than Anambra, while Anambra and Imo had higher municipal permit charges than Abia.

Non-Tariff Barriers: **Abia State** recorded 31 roadblocks (38%), illicit charges (₦1,905; 47%), and security charges (₦5,920; 15%), **Anambra State** recorded 16 roadblocks (28%), illegal charges (₦16,102.5; 56%), and security charges (₦4,553.75; 15%) while **Imo State** had 29 roadblocks (42%), illegal charges (₦23,018.13; 47%), and security charges (₦5,557.5; 11%).

Across the states, there was a total of 76 roadblocks (37%), illegal charges (₦58,195.6; 49%), and security charges (₦16,031.25; 14%). Abia state yam traders were more affected by roadblocks and they paid higher security charges while illegal charges were felt highest by Imo traders.

Overall, the results implied that Imo and Abia States are most affected by trade barriers in the Southeast. The findings align with Karugia et al. (2008), who found roadblocks to be a significant barrier to trade in Kenya, noting that excessive roadblocks lead to time wastage and opportunities for corrupt practices by law enforcement.

4.9 Descriptive Statistics and Categorization of Tariff Barriers and Non-Tariff Barriers to Yam Trade in South East Nigeria

Tariff Barriers

Trade Barrier	Abia State				Anambra State				Imo State				Pooled State			
TBs	**Freq**	**(%)**	**MC(₦)**	**%MC**	**Freq**	**(%)**	**MC(₦)**	**%MC**	**Freq**	**(%)**	**MC(₦)**	**%MC**	**Freq**	**(%)**	**MC(₦)**	**%MC**
Tollgate	**20.0**	**34**	**15306.3**	**52**	**24.0**	**37**	**13173.8**	**51**	**21.0**	**35.59**	**18493.8**	**55**	**65.0**	**36**	**46973.9**	**53**
Produce Charge	**19.0**	**33**	**10125.0**	**34**	**21.0**	**32**	**7392.5**	**28**	**20.0**	**33.90**	**10931.3**	**32**	**60.0**	**33**	**28448.8**	**32**
Municipal Permit	**19.0**	**33**	**4262.5**	**14**	**20.0**	**31**	**5380.0**	**21**	**18.0**	**30.51**	**4480.0**	**13**	**57**	**31**	**14122.5**	**15**
					Non-Tariff Barriers											
NTBs	**Freq**	**(%)**	**MC(₦)**	**%MC**	**Freq**	**(%)**	**MC(₦)**	**%MC**	**Freq**	**(%)**	**MC(₦)**	**%MC**	**Freq**	**(%)**	**MC(₦)**	**%MC**
Roadblock	**31**	**40**	**15500**	**38**	**16**	**27**	**8000**	**28**	**29**	**43**	**20500**	**42**	**76**	**37**	**44000**	**37**
Ilegal Charge	**26**	**34**	**19075**	**47**	**24**	**40**	**16102.5**	**56**	**21**	**31**	**23018.13**	**47**	**71**	**35**	**58195.6**	**49**
Security Charge	**20**	**26**	**5920**	**15**	**20**	**33**	**4553.75**	**16**	**17**	**26**	**5557.5**	**11**	**57**	**28**	**16031.25**	**14**

Source: Field Survey Data Analysis, 2024 * Multiple Responses TBs = Tariff Barriers, NTBs = Non-Tariff Barriers, MC =Mean Cost**

4.3 Effect of Trade Barrier along Category Lines vis-vis TBs and NTBs on Volume of Yam Traded

Four functional forms of ordinary least squares multiple regression were used to estimate the effect of trade barriers on the volume of yam traded in South East, Nigeria. The result is shown in Table 4.10 below.

Abia State

In the result of the effect of tariff barriers (TBs) and non-tariff barriers (NTBs) on the volume of yam traded in Abia State, the double-log and linear functional forms were chosen as the lead equations with the coefficient of multiple determination of 0.729 and 0.687 respectively. This means that 72.9% and 68.7% of the variations of the TBs and NTBs on the volume yam traded were accounted for by the explanatory variables fitted in the model. Variables like price ($P<0.05$), quantity demanded ($P<0.01$), municipal permit ($P<0.01$), tollgate ($P<0.01$), roadblock ($P<0.01$) security charge ($P<0.01$), and illegal charge ($P<0.01$) were significant variables of trade barriers (TBs and NTBs) that affected the volume of yam traded in Abia state.

The coefficient of Price had a positive effect and was statistically significant at five percent to the volume of yam traded. This shows that an increase in the price of yam leads to an increase in the volume of yam traded.

The coefficient of quantity demanded had a negative effect and was significant at ten percent. This shows that a decrease in the volume of yam traded will lead to an increase in the quantity of yam demanded.

The coefficient of the municipal permit was positive and significantly related to the volume of yam traded. This implies that an increase in municipal permit charges leads to an increase in the volume of yam traded.

The coefficient of tollgate was negative and significantly related to the volume of yam traded at ten percent. This implies that an increase in the tollgate charges leads to a decrease in the volume of yam traded.

The coefficient of the roadblock was negative and significantly related to the volume of yam traded. This implies that an increase in the number of roadblocks leads to a decrease in the volume of yam traded.

The coefficient of security charges was negative and significantly related to the volume of yam traded. This implies that an increase in the security charges leads to a decrease on the volume of yam traded.

The coefficient of illegal charges was positive and had a significant effect on the volume of yam traded. This implies that an increase in illegal charges leads to an increase in the volume of yam traded.

The positive effects of price, municipal permit and illegal charges on the volume of yam agree with Santeramo and Lamonaca (2018), who showed that not all non-tariff measures reduce trade; some actually help when they bring structure and predictability to markets.

Anambra State.

Similarly, the result in Anambra State shows that the linear functional form was the lead equation for tariff and non-tariff barriers with the coefficient of multiple determination of 0.855 and 0.854 respectively. This means that 85.5% and 85.4% of the variations of the TBs and NTBs on the volume yam traded were accounted for by the explanatory variables fitted in the model. The coefficient of price had a positive and significant effect on the volume of yam traded at ten

percent for tariff barriers (TBs) and five percent for non-tariff barriers (NTBs) respectively. This implies that an increase in price leads to an increase in the volume of yam traded.

The coefficient of the quantity of yam demanded was positive and had a significant effect on the volume of yam traded at ten percent for NTBs which implies that an increase in the quantity of yam demanded leads to a corresponding increase in the volume of yam traded.

The coefficient of municipal permit was positive and significant at ten percent. This implies that an increase in the municipal permit charges leads to an increase in the volume of yam traded. The coefficient of tollgate had a positive effect and was significant at ten percent to the volume of yam traded. This implies that an increase in the tollgate charges leads to an increase in the volume of yam traded. This does not agree with Mazorodze (2025), who stated that NTBs, including tolls, tend to increase inefficiency in agricultural trade systems.

The coefficient of roadblock was negative and statistically significant at ten percent to the volume of yam traded. This implies that an increase in the number of roadblocks leads to a decrease in the volume of yam traded. This corroborates findings by Engel & Jouanjean (2013) in their West African trade barrier study, which documented that police checkpoints and road harassment significantly impede the movement of food staples, including yam. It also aligns with ECOWAS-wide studies (Isah et al., 2024) showing that procedural and informal NTBs such as checkpoints harm food flow and market efficiency.

The coefficient of illegal charges had a positive effect and was statistically significant at ten percent. This implies that as illegal charges increase, so does the volume of yams traded. This may be due to the traders buying more yams to to annul the impact of the charges they pay.

Imo State

Additionally, in Imo State, the result showed that the semi-log and exponential functional forms were the lead equations for tariff and non-tariff barriers with the coefficient of multiple determination of 0.284 and 0.479 respectively. This means that 28.4% and 47.9% of the variations of the TBs and NTBs on the volume yam traded were accounted for by the explanatory variables fitted in the model.

The coefficient of tollgate had a positive effect and was significant at ten percent to the volume of yam traded. This implies that a decrease in the tollgate charges leads to a decrease in the volume of yam traded.

The coefficient of roadblock had a positive effect and was significant at ten percent to the volume of yam traded. This implies that an increase in the number of roadblocks leads to an increase in the volume of yam traded.

The coefficient of security charges had a positive effect and was significant at ten percent to the volume of yam traded. This implies that an increase in security charges leads to an increase in the volume of yam traded.

In their pan-African study, Diop et al. (2020) show that non-tariff barriers significantly hamper food security by raising trade costs and reducing the flow of agricultural goods. This suggests that while some non-tariff costs might be “worth it” for traders at a micro level, the macro-level impact of NTBs can still be substantially negative for trade volumes and welfare.

Pooled Data

Across the three states, the pooled result showed that the exponential functional form was the lead equation for the TBs and NTBs with the coefficient of multiple determination of 0.916. This means that 91.6% of the variations of the combined effects of TBs and NTBs on the volume yam traded was accounted for by the explanatory variables fitted in the model. Variables like the quantity of yam demanded (P< 0.1), municipal permit (P< 0.1), and illegal charges (P<0.05) were positive while roadblock (P< 0.05) was negative. The coefficient of the quantity of yams demanded was positive and significant at ten percent to the volume of yam traded. This implies that an increase in the quantity of yam demanded leads to an increase in the volume of yam traded by ten percent. This is in line with the findings of Ezeaku and Agbo (2024), who stated that when market demand rises, producers and traders respond by increasing output and trade volumes to meet consumption needs.

The coefficient of the municipal permit charges had a positive effect and was significant at ten percent on the volume of yams traded. This could imply that although municipal charges typically represent added costs, they may also reflect formal participation in regulated markets by these traders, indirectly supporting higher trade volumes. Ezeaku & Agbo (2024) also found that structured regulatory environments lead to improved trade performance.

The coefficient of illegal charges had a positive effect and was significant at five percent. This implies that an increase in illegal charges also leads to an increase in the volume of yams traded. Nwosu (2023) reported that illegal tolls collected at various points along trading routes can inflate product prices by up to 20%. However, traders often absorb these costs to maintain continuity in supply chains, especially where formal enforcement is weak.

Finally, the coefficient of roadblock had a negative effect and was significant at five percent. This implies that an increase in the number of roadblocks leads to a decrease in the volume of yams traded. This is in line with the findings of Anagor-Ewuzie (2024), which highlights that the proliferation of checkpoints on Nigerian roads, often manned by both state and non-state actors, significantly hampers trade flows. These checkpoints not only delay transportation but also serve as avenues for collecting unofficial fees, thereby inflating logistics costs and reducing market efficiency

Table 4.10 Distribution According to effect of trade barriers on Volume of Yam Traded

TB		ABIA	STATE			ANAMBRA	STATE			IMO	STATE			POOLED	STATES	EFFECT	
EV	LF	EF	+DLF	SLF	+LF	EF	DLF	SLF	LF	EF	DLF	+SLF	EV	LF	+EF	DLF	SLF
Cons	887.390	6.127	-8.194	-41800.42	-7.866	6.045	-2.467	-10884.68	1827.22	7.191	6.747	-797.560	Cons	534.12	6.581	-1.998	-14128.64
	(-0.704)	(24.24)	(-2.750)	(-2.852)	(0.035)	(30.333)	(-1.771)	(-3.987)	(3.270)	(19.807)	(1.749)	(-0.136)		(0.838)	(32.311)	(-1.564)	(-2.958)
P	0.001	2.01E-007	0.832	2245.15	8.25E-005	4.92E-008	-0.135	182.87	-1.44E-005	-2.68E-008	0.075	345.49	P	0.001	1.54E-007	0.229	453.28
	(1.739)*	(3.693)	(2.583)**	(1.417)	(1.587)*	(0.991)	(-1.622)*	(-0.646)	(-0.083)	(-0.238)	(0.189)	(0.576)		(3.511)	(5.247)	(1.602)	(0.850)
QD	-0.245	-3.99E-008	0.426	-763.00	0.135	6.15E-005	0.921	1602.29	0.019	3.39E-005	0.026	-304.71	QD	0.074	3.41E-005	0.572	885.54
	(-1.899)*	(-1.507)*	(1.789)*	(-1.628)*	(10.687)	(5.564)	(8.559)	(7.596)	(0.202)	(0.543)	(0.058)	(-0.451)		(1.216)	(1.747)*	(4.672)	(1.935)*
PC	-O.005	-3.94E-006	-0.096	234.41	-0.010	2.56E-005	0.006	-277.66	0.026	1.67E-005	-0.031	98.06	PC	0.012	1.15E-005	0.122	155.49
	(-0.044)	(-0.180)	(-0.313)	(0.153)	(-0.321)	(0.900)	(0.045)	(-1.004)	(0.667)	(0.665)	(0.113)	(0.231)		(0.290)	(0.838)	(1.089)	(0.371)
MP	0.478	8.67E-005	0.575	2431.87	0.048	3.38E-005	0.257	394.25	-0.046	-2.78E-005	-0.262	-363.50	MP	0.102	2.93E-005	0.199	777.08
	(1.561)*	(1.510)*	(1.788)*	(1.536)*	(1.738)*	(1.592)*	(1.752)*	(1.369)	(-0.774)	(-0.724)	(-1.556)*	(-0.855)		(1.826)*	(1.637)*	(1.861)*	(1.946)*
TG	-0.568	-6.54E-006	-0.430	-589.16	0.517	1.19E-005	0.260	60.91	0.007	1.45E-006	0.338	245.19	TG	-0.016	6.33E-006	0.010	-106.28
	(-1.555)*	(-0.337)	(-1.706)*	(-0.410)	(1.641)*	(0.896)	(1.717)*	(0.256)	(0.233)	(0.070)	(2.817)**	(1.882)*		(-0.543)	(0.688)	(0.079)	(-0.236)
R^2	0.627	0.743	0.729	0.625	0.855	0.676	0.819	0.762	0.272	0.253	0.246	0.284	SC	-0.043	-1.83E-005	-0.118	-165.99
														(-0.674)	(-0.905)	(-1.250)	(-0.471)
Adj R^2	0.487	0.660	0.644	0.485	0.829	0.617	0.786	0.718	0.210	0.219	0.227	0.283	IC	0.001	4.43E-005	0.015	-257.15
														(0.023)	(2.581)**	(0.115)	(-0.533)
F-Stat	1.616	6.538	6.189	1.60	32.526	11.463	24.894	17.578	2.425	2.308	2.266	2.504	CT	81.593	0.154	0.015	-211.72
														(0.213)	(1.258)	(0.146)	(-0.566)
NTB					NTB								R^2	0.662	0.916	0.866	0.572
EV	+LF	EF	DLF	SLF	LF	+EF	DLF	SLF	LF	+EF	DLF	SLF	Adj R^2	0.601	0.877	0.838	0.513
Cons	-3755.95	5.88	-8.446	-41485.4	520.51	6.602	-2.290	-9581.28	1506.395	6.812	6.452	-1615.15	F-Stat	4.331	13.039	10.339	4.576
	(-1.146)	(8.626)	(-2.267)	(-2.255)	(1.768)	(26.209)	(-1.376)	(-2.961)	(1.756)	(12.389)	(1.752)	(-0.284)					
P	0.001	2.24E-007	1.125	2768.50	0.001	8.52E-008	0.011	-173.98	2.61E-005	-2.81E-008	-0.154	240.759					
	(2.030)**	(4.744)	(0.318)	(1.789)*	(2.187)**	(1.958)*	(0.059)	(0.405)	(0.150)	(-0.252)	(-0.305)	(0.308)					
QD	-0.011	-1.55E-006	-0.036	-807.86	0.123	5.03E-005	0.814	1602.42	0.006	3.46E-005	0.241	-164.099					
	(-0.397)	(-0.267)	(-0.157)	(-0.716)	(7.939)	(3.793)	(4.883)	(4.957)	(0.067)	(0.585)	(0.465)	(-0.205)					
RB	109.46	0.414	1.091	5073.32	-12.577	-0.012	-0.147	81.457	8.118	0.408	0.331	279.358					
	(-1.544)*	(1.927)*	(1.694)*	(1.596)*	(-1.578)*	(-1.782)*	(-1.151)	(0.329)	(0.422)	(1.663)*	(1.751)*	(0.413)					
SC	-0.257	-3.74E-005	0.406	-255.63	0.008	8.40E-006	0.040	168.44	0.054	4.20E-005	0.161	136.415					
	(-1.596)*	(-0.616)	(1.556)*	(-0.145)	(0.202)	(0.255)	(0.343)	(0.750)	(0.950)	(1.752)*	(0.700)	(0.383)					
IC	0.440	-1.11E-006	-0.620	899.71	0.021	2.25E-005	0.263	-170.975	-0.008	-5.102E-006	-0.144	-66.317					
	(1.577)*	(-1.568)	(-1.735)*	(-0.467)	(1.868)	(2.290)**	(1.975)*	(-0.663)	(-0.326)	(-0.322)	(-0.360)	(-0.107)					
R^2	0.687	0.747	0.752	0.458	0.854	0.687	0.807	0.751	0.472	0.479	0.456	0.466					
Adj R^2	0.553	0.662	0.668	0.316	0.827	0.630	0.772	0.706	0.451	0.459	0.416	0.444					
F-Stat	2.143	6.429	6.570	1.834	32.047	12.085	22.991	16.612	2.424	2.470	2.325	2.388					

Source: Field Survey Data Analysis, 2024, TBs = Tariff Barriers, NTBs = Non-Tariff Barriers, EV = Explanatory Variable, LF = Linear Function, EF = Exponential Function, DLF = Double-Log Function, SLF = Semi-Log Function, Cons = Constant, P = Price, QD = Quantity Demanded, PC =Produce Charge, MP = Municipal Permit, TG = Tollgate, RB = Roadblock, SC = Security Charge, IC = Illegal Charges, + = Lead Equation, * = Significant @ 10%, ** = Significant @ 5%, Value in parentheses are the t-ratio

4.4 Description of the Extent of Effect of Trade Barriers on the Volume of Yam Traded

The result of the extent of the effect of trade barriers on the volume of yam traded in the study area is shown in Table 4.11

The results of the extent of the effect of trade barriers vis and vis Tariff Barriers and Non-Tariff Barriers on the volume of yam traded showed that in Abia State a total of 6124.38kg of yam were traded and barriers such as tollgate ($\mu = 4.93$, SD = 2.41), municipal permit ($\mu = 4.85$, SD = 2.34), produce charge ($\mu = 4.83$, SD = 2.48) , and security charge ($\mu = 4.95$, SD = 2.43) all had a medium effect on the volume of yam traded in Abia State, while roadblock ($\mu = 7.78$, SD = 2.72) and illegal charges ($\mu = 6.38$, SD = 2.06) had very high effects. This implies that the volume of yam traded in the study area was affected greatly by roadblocks and illegal charges in Abia State. These trade barriers were identified as affecting the flow and frequency of the yam trade in the state.

In Anambra State, the result showed that a total of 5762.80kg of yams were traded in a month. Tollgate ($\mu = 6.13$, SD = 3.16), municipal charges ($\mu = 5.05$, SD = 2.37), produce charge ($\mu = 5.05$, SD = 2.38), and illegal charges ($\mu = 5.90$, SD = 1.98) effected the volume of yam traded in the state highly while roadblock ($\mu = 4.00$, SD = 2.03) and security charges ($\mu = 4.90$, SD = 2.31) had medium effects on the volume of yam traded in the state.

In Imo State, the result also revealed that a total of 4860kg of yams was traded in a month and that roadblocks ($\mu = 7.28$, SD = 3.68), tollgates ($\mu = 5.20$, SD = 2.87) and illegal charges ($\mu = 5.23$, SD = 2.74) highly affected the volume of yam traded, while municipal permits ($\mu = 4.23.$, SD = 2.68), produce charges ($\mu = 4.93.$, SD = 2.96) and security charges ($\mu = 4.15.$, SD = 2.79) had medium effects on the volume of yam traded in the State.

Across the states, the result showed that a total of 16747.18kg of yams were traded in a month in southeast Nigeria. Barriers such as roadblocks (μ = 7.90, SD = 3.32), illegal charges (μ = 5.83, SD = 2.32), and tollgate (μ = 5.42, SD = 2.85), highly effected the volume of yam traded while, produce charge (μ = 4.93, SD = 2.60), municipal permit (μ = 4.78, SD = 2.46), and security charges (μ = 4.67, SD = 2.49), all had medium effects on the volume of yam traded in the study area.

This implied that these charges indirectly increase the cost of transporting the yam and also increase the cost of the yam thereby reducing the volume of the yam traded (Kwara *et al*, 2022 ; Ogundari and Adeyemi, 2019).

Table 4.11 Distribution according to the extent of effect of trade barriers on the volume of yam traded

ABIA STATE	TB	Frequency	%	Mean Value	Stdev	Extent of TBs Effect	NTBs	Frequency	%	Mean Value	Stdev	Extent of NTBs Effect
Volume of Yam Traded (6124.38kg)	Tollgate	20.00	34.48	4.93	2.41	ME	Roadblock	31.00	40.26	7.78	2/72	VHE
	Municipal Permit	19.00	32.76	4.85	2.34	ME	Illegal Charges	26.00	33.77	6.38	2.06	VHE
	Produce Charge	19.00	32.76	4.83	2.48	ME	Security charge	20.00	25.97	4.95	2.34	ME
ANAMBRA STATE	**TB**	**Frequency**	**%**	**Mean Value**	**Stdev**	**Extent of TB Effect**	**NTBs**	**Frequency**	**%**	**Mean Value**	**Stdev**	**Extent of NTBs Effect**
Volume of Yam Traded (5768.80kg)	Tollgate	25.00	38.46	6.13	3.16	VHE	Roadblock	16.00	26.67	4.00	2.03	ME
	Municipal Permit	20.00	30.77	5.05	2.37	HE	Illegal Charges	24.00	40.00	5.90	1.98	HE
	Produce Charge	20.00	30.77	5.05	2.38	HE	Security Charge	20.00	33.33	4.90	2.31	ME
IMO STATE	**TBs**	**Frequency**	**%**	**Mean Value**	**Stdev**	**Extent of TBs Effect**	**NTBs**	**Frequency**	**%**	**Mean Value**	**Stdev**	**Extent of NTBs**
Volume of Yam Traded (4860.00kg)	Tollgate	21.00	35.59	5.20	2.87	HE	Roadblock	29.00	43.28	7.28	3.68	VHE
	Municipal Permit	18.00	30.51	4.23	2.68	ME	Illegal Charges	21.00	31.34	5.23	2.74	HE
	Produce Charge	20.00	33.90	4.93	2.96	ME	Security charge	17.00	25.37	4.15	2.79	ME
COMBINED EFFECT	**TBs**	**Frequency**	**%**	**Mean Value**	**Stdev**	**Extent of TBs Effect**	**NTBs**	**Frequency**	**%**	**Mean Value**	**Stdev**	**Extent of NTBs Effect**
Volume of Yam Traded (16747.18kg)	Tollgate	66.00	36.26	5.42	2.85	HE	Roadblock	76.00	37.81	7.9	3.32	VHE
	Municipal Permit	57.00	31.32	4.78	2.46	ME	Illegal Charges	71.00	35.32	5.83	2.32	HE
	Produce Charge	59.00	32.42	4.93	2.60	ME	Security charge	54.00	26.87	4.67	2.49	ME

Source: Field Survey Data Analysis, 2024. * Multiple Responses μ (mean) =4.0 - 5.0, Medium Effect (ME), μ (mean) = 5.0 – 6.0, High Effect (HE), μ (mean) = 6.0 and above, Very High Effect (VHE) and μ (mean) < 4.0, Low Effect (LE).**

4.5 Profit Estimation of Yam Traders in the Study Area

The result of the estimated profit of yam traders in a month is shown in Table 4.12 below.

The results showed the profit analysis of yam traders in Abia State, Anambra State, and Imo State. The traders across the States made an average profit of ₦1,31,260.85 (Abia State), ₦3,529,073.80 (Anambra State), and ₦2,833,671.37 (Imo State) from the sales of 4670.25kg, 3448.50kg, and 4128kg of yams, respectively. This shows that Abia State sold the highest volume of yams but made the least profit. This may be due to some barriers having a greater effect on Abia State compared to other states. For example, Abia incurred higher security charges than Anambra and Imo, while illegal fees and roadblocks had very high effects on yam trade in the state.

The results also revealed that Abia State incurred the highest cost, followed by Imo State and Anambra State, with costs of ₦354,276.25, ₦269,764.25, and ₦350,937.63, respectively. The pooled results of all the states showed that a total of 16747.18kg was sold in the study area. The return on investment showed that 11.74% of the profit was realized from the trading of yams despite the additional costs from the trade barriers witnessed in the study area. This indicated that yam trading is profitable.

Table 4.12 Distribution according to cost and return of yam traders per month

	Abia State			Anambra State	
Items	**Details**	**Amount (₦)**	**Items**	**Details**	**Amount (₦)**
Sales	6124.38kg @ ₦4,670.25	28,602,385.70	Sales	5762.80kg@₦3448.50	19,873,015.80
(A) SP		**₦28,602,385.70**	(A) SP		**₦19,873,015.80**
Purchase	8990.63kg @ ₦2,995.88	26,934,848.60	Purchase	8123.40kg@₦1,978.75	16,074,177.75
(B) PC		**₦26,934,848.60**	(B) PC		**₦16,074,177.75**
Cost			Cost		
Tollgate		15,306.25	Tollgate		13,173.80
Loading/offloading		11,825.00	Loading/offloading		9,445.00
Produce charge		10,125.00	Produce charge		7,392.50
Municipal charge		4,262.50	Municipal charge		5,380.00
Illegal charge		19,075.00	Illegal charge		16,102.50
Security charge		5,920.00	Security charge		4,553.75
Union charge		3,137.50	Union charge		2,575.00
Vehicle hire		284,625.00	Vehicle hire		211,141.70
(C)MC		₦354,276.25	(C) MC		₦269,764.25
Profit =A-(B+C)		**₦1,313,260.85**	**Profit =A-(B+C)**		**N3,529,073.80**
ROI = $(\frac{\textbf{profit}}{\textbf{sales}} \boldsymbol{x}\ \textbf{100}\%)$		**4.60%**	**ROI =** $(\frac{\textbf{profit}}{\textbf{sales}} \boldsymbol{x}\ \textbf{100}\%)$		**17.76%**

Imo State			Pooled States		
Sales	4860kg@₦4,128	20,063,080.00	Sales	16747.18@₦4,082.25	68,366,175.56
(A) SP		**₦20,063,080.00**	(A) SP		**₦68,366,175.56**
Purchase	7003.10@₦2,410	16,877,471.00	Purchase	24117.13@₦2,461.54	59,365,280.18
(B) PC		**₦16,877,471.00**	(B) PC		**₦59,365,280.18**
Cost			Cost		
Tollgate		18,493.75	Tollgate		46,973.80
Loading/offloading		10,244.50	Loading/offloading		31,514.50
Produce charge		10931.25	Produce charge		28,448.75
Municipal charge		4,480.00	Municipal charge		14,122.50
Illegal charge		23,018.13	Illegal charge		58,195.63
Security charge		5,557.50	Security charge		16,031.25
Union charge		3,312.50	Union charge		9,025.00
Vehicle hire		274,900.00	Vehicle hire		770,666.70
(C)MC		₦350,937.63	(C)MC		₦974,977.88
Profit =A-(B+C)		**₦2,833,671.37**	**Profit =A-(B+C)**		**₦8,025,917.50**
ROI = $(\frac{\textbf{profit}}{\textbf{sales}} \boldsymbol{x}\ \textbf{100}\%)$		**14.12%**	**ROI =** $(\frac{\textbf{profit}}{\textbf{sales}} \boldsymbol{x}\ \textbf{100}\%)$		**11.74%**

Source: Field Survey Data Analysis, 2024. SP = selling price, PC = purchase cost, ROI = Return on Investment, MC = marketing cost

4.6 Effect of TBs and NTBs on the Profit of Yam Traders

The result of the analysis of the effect of trade barriers (TBs and NTBs) on the profit of yam traders is shown in Table 4.13

Abia State

In Abia State, the linear functional form was chosen as the lead equation with the coefficient of multiple determination of 0.849 and 0.833 for TBs and NTBs respectively. This means that 84.9% and 83.3% of the variations in the profit of yam traders were accounted for by the explanatory variables in the model. Quantity demanded ($P<0.05$) was positive and significant for both TBs and NTBs, while tollgate ($P<0.05$), roadblocks ($P<0.01$), and illegal charges ($P<0.01$) were negative and significant variables of trade barriers (TBs and NTBs) that affected the profit of yam traders in Abia

The coefficient of quantity demanded was positive and significantly related to the profit at five percent. This shows that an increase in the quantity of yam demanded in the state will lead to a corresponding increase in the profits of the yam traders.

The coefficients of tollgates, roadblocks, and illegal charges were negative and significantly related to the profit of yam traders. This implies that as these variables decrease, the profits of the traders increase.

Bromley and Foltz (2011) emphasized that corruption and bribes along trade corridors in West Africa significantly raise transportation costs and reduce trade sustainability, while Awa (2025) documented the pervasive nature of illegal tolls on Nigerian highways, corroborating the negative effects of such trade barriers on traders' incomes.

Anambra State

Similarly, the result in Anambra State showed that the semi-log functional form and the double-log functional form were the lead equation for tariff and non-tariff barriers with the coefficient of multiple determination of 0.845 and 0.983 respectively. This means that 84.5% and 98.3% of the variations in the profit of yam traders were accounted for by the explanatory variables fitted in the model. The coefficients of municipal charge ($P< 0.1$), quantity demanded ($P<0.1$), and tollgate ($P<0.1$) were positive and significant at ten percent for both TB and NTB whereas the coefficient of produce charge was negative and significant for both TB and NTB.

The coefficient of the quantity demanded of yam was positive and significantly related to the profit of yam traders at ten percent. This implies that an increase in the quantity demanded of yam leads to an increase in the profit of yam traders.

The coefficients of municipal and tollgate charges were also positive and significant at ten percent. This implies that an increase in any of these variables leads to an increase in the profit of yam traders.

The coefficient of produce charge was negative and significant for both TB and NTB. This implies that a reduction in produce charge led to an increase for the traders.

Imo State

In Imo State, the result revealed that the linear functional forms were the lead equations for tariff and non-tariff barriers with the coefficient of multiple determination of 0.648 and 0.644 respectively. This means that 64.8% and 64.4% of the variations of the TBs and NTBs on the profit yam traders were accounted for by the explanatory variables fitted in the model.

The coefficient of municipal charge (P<0.1) was positive and significant at ten percent to the profit of yam traders. This implies that an increase in the municipal charges leads to an increase in the profit of the yam traders.

The coefficient of roadblock (P<0.1) was negative and significant at ten percent. This implies that a decrease in the number of roadblocks leads to an increase in the profit of yam traders.

The coefficient of illegal charges (P<0.1) was negative and significant at ten percent. This implies that a decrease in illegal charges leads to an increase in the profit of yam traders.

Pooled Data

When viewing the southeast as a whole, the result showed that the semi-log functional form was the lead equation for both TBs and NTBs with the coefficient of multiple determination of 0.773. This means that 77.3% of the variations of the combined effects of (TBs and NTBs) on the profit of yam traders were accounted for by the explanatory variables fitted in the model. Variables like tollgate (P< 0.1) was positive while produce charge (P< 0.05), roadblocks (P<0.1), and illegal charges (P<0.1) were negative.

The tollgate coefficient was positive and significant. This indicates that increases in tollgate charges also increase the profit of the yam traders. The positive tollgate effect likely means that using tolled roads gives traders benefits like better roads, faster delivery, and access to bigger markets so they earn more even after paying the toll.

The coefficients of produce charge and roadblocks were negative and significantly related to the profit of yam traders. This implies that any decrease in either produce charge or/roadblocks leads to an increase in the profit of yam traders.

Finally, the coefficient of illegal charges was negative and significant at ten percent. This implies that a decrease in illegal charges leads to an increase in the profit of yam traders. This agrees with Tšehlo (2024) who stated that police corruption on transport corridors in West and East Africa, showing that bribery and extortion at checkpoints significantly increase transport costs, undermining trade integration.

Table 4.13 Regression analysis of the effect of TBs and NTBs on the profit of yam traders in the study area

TB	Abia	State				Anambra	State			Imo	State	
Explanatory Variable	**+Linear**	**Exponential**	**Double-log**	**Semi-log**	**Linear**	**Exponential**	**Double-log**	**+Semi-log**	**+Linear**	**Exponential**	**Double-log**	**Semi-log**
Constant	48619.16	12.640	-7.385	-200146.15	-208755.23	13.463	-2.068	-437856.04	325347.17	12.824	-5.591	-180214.68
	(0.204)	(35.091)	(-2.185)	(-6.361)	(-3.009)	(81.251)	(-3.956)	(-11.396)	(0.936)	(30.008)	(-1.490)	(-5.526)
Price	0.495	3.984E-007	1.984	1514320.92	0.964	2.75E-007	1.172	274922.39	0.537	5.12E-007	1.870	166043.43
	(9.640)	(5.137)	(5.433)	(4.454)	(57.188)	(6.821)	(21.850)	(6.978)	(5.968)	(4.628)	(4.364)	(4.459)
Quantity	12.434	3.373E-006	0.089	671929.15	-1.162	8.37E-006	0.009	198734.22	-192.708	0.001	-1.136	-783029.42
demanded	(2.251)**	(0.405)	(0.332)	(2.679)**	(-0.303)	(0.915)	(0.228)	(0.678)	(-4.169)	(-4.661)	(-2.582)**	(-2.049)**
Produce	-23.958	-3.479E-006	-0.241	-481440.40	-11.269	2.75E-005	-0.053	-677123.08	-5.479	1.38E-005	0.038	-110788.45
charge	(-1.158)	(-0.111)	(-0.691)	(-1.484)	(-1.141)	(1.166)	(-0.994)	(-1.746)*	(-0.248)	(0.507)	(0.131)	(-0.432)
Municipal	27.261	-2.097E-006	-0.042	193046.38	2.162	-9.81E-006	-0.003	682603.64	57.489	5.02E-005	0.111	254682.37
permit	(0.470)	(-0.024)	(-0.115)	(0.568)	(0.257)	(-0.488)	(-0.048)	(1.706)*	(1.717)*	(0.642)	(0.304)	(0.800)
Tollgate	-42.470	-3.991E-005	-0.744	-450329.40	-1.460	-4.46E-006	-0.030	491494.72	-0.386	1.38E-005	-0.021	19701.55
	(-2.317)**	(-1.443)	(-2.245)**	(-1.460)	(-0.314)	(-0.401)	(-0.648)	(1.536)*	(-0.021)	(0.613)	(-0.055)	(0.061)
R^2	**0.849**	**0.587**	**0.730**	**0.806**	**0826**	**0.797**	**0.977**	**0.845**	**0.647**	**0.530**	**0.520**	**0.588**
Adj R^2	**0.822**	**0.512**	**0.681**	**0.771**	**0.805**	**0.760**	**0.973**	**0.816**	**0.583**	**0.445**	**0.433**	**0.514**
F-statistic	**31.000**	**7.807**	**14.888**	**22.840**	**24.441**	**21.617**	**34.361**	**29.887**	**10.080**	**6.204**	**5.966**	**7.862**
NTB												
	+Linear	**Exponential**	**Double-log**	**Semi-log**	**Linear**	**Exponential**	**+Double-log**	**Semi-log**	**+Linear**	**Exponential**	**Double-log**	**Semi-log**
Constant	7.4231.79	13.046	-6.936	-191772.53	-130848.96	13.208	-0.964	-433863.44	74334.49	12.843	-5.765	-16347.79
	(1.048)	(13.142)	(-1.478)	(-4.649)	(-1.538)	65.729	(-1.877)	(-9.439)	1.554	21.773	-1.475	-4.880
Price	0.415	3.420E-007	1.815	143727.21	0.965	2.73E-007	1.070	326149.04	0.586	5.28E-007	2.084	20546.40
	(8.780)	(4.967)	(9.598)	(4.143)	(65.625)	7.872	(18.307)	(6.229)	6.194	4.523	3.918	4.509
Quantity	9.423	1.214E-006	-0.041	512176.21	-3.220	2.19E-005	0.099	-425635.19	-205.110	0.001	-1.300	-105318.32
demanded	(1.625)*	(0.144)	(-0.143)	(2.025)	(-0.719)	2.068	(1.923)*	(-0.924)	-3.982	-4.017	-2.372	-2.243
Roadblocks	-20499.89	-0.12	-0.048	-272543.65	-2281.60	0.013	0.107	-584072.72	-4007.57	0.004	-0.146	-314754.45
	(-1.991)*	(-0.559)	(-0.059)	(-0.382)	(-0.991)	2.301	(2.724)**	(-1.654)*	-1.572	0.300	-0.297	-0.149
Security	14.650	-4.768E-005	0.054	367090.27	-10.716	-3.92E-005	-0.119	-78769.97	-3.263	-2.41E-006	-0.089	79699.89
charge	(0.242)	(-0.540)	(-0.059)	(0.849)	(-0.964)	-1.492	(-3.326)	(-0.246)	-0.099	0.060	-0.339	0.356
Illegal charges	-12.482	7.152E-005	-0.682	-768751.95	-1.281	-1.67E-006	-0.053	475393.30	-7.911	1.33E-005	0.074	-350237.64
	(-1.758)*	(0.030)	(-1.514)*	(-1.942)*	(-0.386)	-0.024	-1.284	(1.294)	-1.546	0.762	0.171	-0.940
Commodity tax	-84609.58	0.178	0.057	-212484.51	46979.59	0.098	0.005	-106725.05	23553.01	0.314	0.241	59375.39
	(-0.431)	(0.622)	(0.228)	(-0.966)	(0.705)	0.622	0.111	(-0.264)	0.970	1.047	0.813	0.234
R^2	**0.833**	**0.571**	**0.682**	**0.797**	**0.976**	**0.819**	**0.983**	**0.831**	**0.644**	**0.523**	**0.523**	**0.602**
Adj R^2	**0.801**	**0.490**	**0.623**	**0.759**	**0.955**	**0.786**	**0.980**	**0.801**	**0.579**	**0.437**	**0.437**	**0.530**
F-statistic	**26.526**	**7.092**	**11.459**	**20.926**	**321.013**	**24.837**	**323.378**	**27.121**	**9.944**	**6.042**	**6.038**	**8.328**

Pooled Effect	Linear	Exponential	Double-log	+Semi-log
Constant	6325.08	12.318	-7.105	-199638.04
	(0.027)	(35.09)	(-3.161)	(-10.506)
Price	0.403	3.35E-007	1.775	161850.23
	(12.007)	(6.612)	(7.071)	(7.626)
Quantity	12.967	9.29E-007	-0.233	-171967.77
demanded	(0.582)	(0.028)	(-1.081)	(-0.945)
Produce	-27.967	-1.53E-005	-0.342	-434654.42
charge	(-1.782)*	(-0.067)	(-1.732)*	(-2.607)**

Municipal charge	6.088 (0.298)	-2.095E-005 (-0.697)	0.009 (0.047)	152677.63 (0.961)
Tollgate	-1.758 (-0.168)	-5.89E-006 (-0.372)	-0.121 (-0.570)	256794.84 (1.532)*
Roadblocks	414.37 (0.078)	0.004 (0.533)	-0.114 (-0.580)	-252733.66 (1.525)
Security charge	-5.681 (-0.247)	-1.26E-005 (-0.362)	-0.034 (-0.203)	70999.56 0.506
Illegal charge	-0.364 (-0.042)	9.27E-006 (0.704)	0.072 (0.319)	-113912.10 -1.594
R^2	**0.722**	**0.456**	**0.608**	**0.773**
Adj R^2	**0.699**	**0.412**	**0.576**	**0.647**
F-statistic	**31.694**	**10.251**	**18.980**	**35.191**

Source: Field Survey Data Analysis, 2024, TBs = Tariff Barriers, NTBs = Non-Tariff Barriers, + = Lead Equation, * = Significant @ 10%, ** = Significant @ 5%., Values in parentheses are the t-ratio.

4.7 HYPOTHESES TESTING

4.7.1 Hypothesis 1 which stated that the effect of trade barriers will be negative and significantly related to volume of trade is presented in Table 4.14 below, significant variables were accepted.

Table 4.14 Effect of TBs and NTBs on Volume of Yam Traded

Explanatory variables	Apriori	Estimated	Significance @5% and 10%	Decision
Price	+	+	Not Significant	Rejected
Quantity	+	+	Significant	Accepted
Produce charge	-	+	Not Significant	Rejected
Municipal permit	-	+	Significant	Accepted
Tollgate	-	+	Not significant	Rejected
Roadblock	-	-	Significant	Accepted
Security charge	+	-	Not significant	Rejected
Illegal charge	-	+	Significant	Accepted

Source: Field Survey Data, 2024

4.7.1 Hypothesis II which stated that TBs and NTBs have no significant effect on the profit of yam traders was tested using Z statistics

Table 4.15 Hypothesis of Z Statistics testing

Description	Value(₦)	Decision Rule
Mean profit TBs	1,410,000	
Mean profit NTBs	1,692,513	Accepted
Stdev of profit TBs	1,167,391	
Stdev of profit NTBs	1,281,900	
Sample size (n)	120	
Z calculated	-1977.5	
Z tabulated @ 5% critical level	0.1057	

Source: Field Survey Data Analysis, 2024

Since Z- tabulated is greater than Z calculated, the null hypothesis is accepted which means that TBs and NTBs do not have any significant effect on the profit of the yam traders. This suggested that even though tariff (TBs) and non-tariff barriers (NTBs) affected the profit of the yam traders in the study area, these effects were not significant enough.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

The study investigated domestic trade barriers in South East Nigeria, with a focus on yam trade. The specific objectives were to describe the socioeconomic characteristics of yam traders in the region, characterize the barriers to yam trade (tariff and non-tariff barriers), describe the extent to which trade barriers affected the volume of yam traded, estimate the profit of yam traders, and determine the effect of trade barriers on the profit of yam traders. Primary data were collected from 120 respondents using a set of well-structured questionnaire and the data were analyzed using descriptive statistics, profit model, and Ordinary Least Square multiple regression.

The descriptive statistics results showed the traders' mean ages in Anambra, Abia, and Imo State were 46 years, 47 years, and 46 years respectively. The mean age across the states was 46 years. The pooled results showed that 60.83% of the respondents were male, and 39.17% female. Marital status revealed that 67.5% of traders in Abia were married, 80% in Anambra, and 70% in Imo. Educational backgrounds showed that 50% of traders in Abia had secondary education, while in Anambra it was 42%, and in Imo, 70% had completed secondary school.

Household size averaged 5 persons across the three states. When considering trading experience, Abia traders had an average of 13 years, Anambra traders averaged 15 years, and those in Imo state had about 12 years, bringing the pooled trading experience to about 13 years.

In terms of yam trading volume, traders in Abia handle approximately 1.68 tons, those in Anambra trade around 1.7 tons, and Imo traders averaged 1.86 tons of yam monthly thereby leading in trading volume.

The study categorized trade barriers into tariff barriers (TBs) and non-tariff tariff barriers (NTBs) alongside their associated costs. The result showed that TBs, NTBs and their associated cost in Abia State included tollgate (₦15,306.3, 51.55%), produce charge (₦10,125, 34.10%), municipal permit (₦4,262.5, 14.36%), 31 roadblocks (38.28%), illicit charges (₦1,905, 47.10%), and security charges (₦5,920, 14.62%). In Anambra state tollgate cost ₦13,173.8(50.77%), produce charges were ₦7,392.5(28.49%), municipal permits cost ₦5,380, 20.74%, there were 16 roadblocks (27.91%), illegal charges were ₦16,102.5 (56.19%) and, security charges were (₦4,553.75 (15%). Finally, Imo State had tollgate (₦18,493.8, 54.55%), produce charge (₦10,931.3, 32.24%), municipal permit (₦4,480, 13.21%), 29 roadblocks (41.77%), illegal charges (₦23,018.13, 46.90%), and security charges (₦5,557.5, 11.33%).

The result of the effect of trade barriers on the volume of yam traded in South East showed that quantity demanded ($P< 0.1$), municipal permit ($P< 0.1$), illegal charges ($P<0.05$), roadblock ($P< 0.05$) were significantly related to the volume of yam traded.

The result of the extent of effect of trade barriers on the volume of yam traded showed that in Abia State, a total of 6124.38kg of yam was traded per month and barriers such as tollgates ($\mu = 4.93$, $SD = 2.41$), municipal permits ($\mu = 4.85$, $SD = 2.34$), produce charge ($\mu = 4.83$, $SD = 2.48$) and security charge ($\mu = 4.95$, $SD = 2.43$) all had medium effects while roadblock ($\mu = 7.78$, $SD = 2.72$) and illegal charges ($\mu = 6.38$, $SD = 2.06$) had very high effects on the volume of yam traded. For Anambra State, a total of 5762.80kg of yams were traded in a month, tollgate ($\mu = 6.13$, $SD = 3.16$), municipal charges ($\mu = 5.05$, $SD = 2.37$), produce charge ($\mu = 5.05$, $SD = 2.38$), and illegal charges ($\mu = 5.90$, $SD = 1.98$) had high effects and roadblocks had high effect on the volume of yam traded in the State. In Imo State, the result also revealed that a total of 4860kg of yams was traded in a month and that roadblocks ($\mu = 7.28$, $SD = 3.68$), tollgates ($\mu = 5.20$, $SD = 2.87$) and illegal charges ($\mu =$

5.23, SD = 2.74) highly affected the volume of yam traded, while municipal permits (μ = 4.23., SD = 2.68), produce charges (μ = 4.93., SD = 2.96) and security charges (μ = 4.15., SD = 2.79) had medium effects on the volume of yam traded in the State. Across the region, a total of 16747.18kg of yams were traded in a month. Barriers such as roadblocks (μ = 7.90, SD = 3.32), illegal charges (μ = 5.83, SD = 2.32), and tollgate (μ = 5.42, SD = 2.85), highly affected the volume of yam traded while, produce charge (μ = 4.93, SD = 2.60), municipal permit (μ = 4.78, SD = 2.46), and security charges (μ = 4.67, SD = 2.49), all had medium effects on the volume of yam traded in the study area.

The result of the profit of yam traders showed an average profit of ₦1,31,260.85 (Abia State), ₦3,529,073.80 (Anambra State), and ₦2,833,671.37 (Imo State) from the sales of 4670.25kg, 3448.50kg, and 4128kg of yams respectively.

The result of the effect of trade barriers on the profit of yam traders showed that tollgate (P< 0.1), produce charge (P< 0.05), roadblocks (P<0.1), and illegal charge (P<0.1) were significant to the profit of yam traders.

5.2 Conclusion

The study revealed that the majority of yam traders in the study area were young, predominantly male, exhibit high level of knowledge and competence in managing the complexities of both tariff and non-tariff barriers. These individuals also tend to maintain relatively small households, a factor that may contribute to lower consumption expenditure in their yam business.

An important finding of the study is the significant effects of trade barriers on the volume of yam traded. On average, traders in the study area handled 16,747.18kg of yam per month indicating large level of commercial activity. Among the states examined, Imo State recorded the highest average volume of yam traded monthly, highlighting its crucial role in the yam

trade network of the region. However, this dominance in trade volume coincides with greater financial strain, as Imo and Abia States were found to face higher tariff-related costs compared to Anambra. In contrast, municipal permit costs were more notable in Anambra and Imo States than in Abia, further emphasizing the uneven distribution of trade-related costs across the region.

The study also established that trade barriers impose additional costs on traders, spanning from the point of origin to the final destination. Roadblocks were most prevalent in Abia State, followed by Imo State. Illegal charges were highest in Imo State, while security charges were more prominent in Abia state. Overall, these findings suggest that the Imo and Abia States were most affected by trade barriers in the Southeast.

Additional factors contributing to increased trading costs were identified, including commodity price, quantity demanded, produce charges, and union charges. These variables were found to inflate operational costs, thereby reducing profit margins, limiting market accessibility, diminishing trade volumes, and influencing consumer purchasing behavior in the region.

Furthermore, the study revealed that tollgate charges play a direct role in increasing the cost of transporting yam to Southeast markets, aggravating the financial pressures faced by traders. Despite these many costs associated with trade barriers, the study concluded that yam trading remains a viable and profitable enterprise, offering a reasonable return on investment.

5.3 Recommendations

Based on the findings of this study, the following recommendations were made:

1. Given that most yam traders in the zone are young, knowledgeable, and capable, trainings and mentorship programs that could help them grow their operations and navigate their challenges should be provided.

2. Trade barriers are significantly affecting trade especially in Imo and Abia states. To reduce this, governments of the southeastern states, should work on harmonizing tariff across states and removing redundant levies. This would lower trading costs and improve profits of the traders.
3. The frequent roadblocks and illegal charges create avoidable stress and financial strain for traders. State authorities should implement stricter monitoring and enforcement to eliminate these extortion practices.
4. Governments and stakeholders should invest in better road networks, regulated toll systems, and centralized loading points to reduce logistics costs. These investments will not only ease movement but also boost the volume of yam traded across the region.

5.4 Contribution to Knowledge

1. **Socioeconomic Insights**: The study reveals that most traders in the study area are middle-aged and mostly males, highlighting the need for targeted training and support programs to address this demographic shift.

2. **Impact of Trade Barriers**: The research shows how tariff and non-tariff barriers affect yam trading, underlining the importance of policy changes to improve the trading environment. It also reveals how barriers like illegal charges and roadblocks place unnecessary financial and emotional burden on traders undermining the ease of doing business especially in the southeast.

3. **Understanding Trade Costs**: The study examined the various costs traders face, offering a outline to help streamline supply chains and reduce expenses.

4. **Profitability Analysis**: The research demonstrates the profit potential in the yam trading sector, making it an attractive opportunity for investors.

5. **Foundation for Future Research**: The study identifies knowledge gaps in our understanding of traders' social networks, providing a basis for further research.

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