



INTERNATIONAL TRADE AND LIFE EXPECTANCY IN NIGERIA

¹Dr. Joseph Aghaegbuna Anozie, ²Dr. Emeka Nkoro

¹Institute of International Trade and Development, University of Port Harcourt

²Institute of International Trade and Development, University of Port Harcourt

ABSTRACT

This study investigated the relationship between International Trade and Life expectancy in Nigeria. International trade is the independent variable with proxies as import, export, foreign direct investment and exchange rate while life expectancy is the dependent variable. The specific objectives are to find out if any significant long run and short run relationship exist between each of the proxies used for international trade and life expectancy. Ex Post facto research approach was adopted. A total of 200 observations, 40 for each of the five variables, covering the period from 1981 to 2020, were used for this study. Data analysis involved Unit root test and Auto Regressive Distributed Lag (ARDL) tests to determine the existence of short and long run relationships. The results of data analysis suggest that increase in import causes decrease in life expectancy; increase in foreign direct investment leads to improvement in life expectancy and increase in exchange rate leads to reduction in life expectancy in Nigeria. The study suggest that export does not have any significant influence on life expectancy in Nigeria. The study recommends that the Nigeria government should strengthen the capacity and effectiveness of its regulatory agencies responsible for monitoring imports such as Customs, NSO and NAEDAC to ensure that prohibited goods, sub-standard products and goods that do not meet standard, quality, health and environmental considerations are not imported into the country. Government and relevant agencies should intervene and encourage foreign direct investment as this will impact positively on life expectancy in Nigeria. CBN should protect the Naira from devaluation pressures as high exchange rate was found to negatively influence life expectancy in Nigeria.

KEY WORDS: *International trade, foreign exchange, foreign direct investment and life expectancy.*

INTRODUCTION

There has been growing interest about the impact of international trade on the health and well-being of citizens. While there seem to be near consensus that international trade impacts positively on economic growth there has been little research on the impact of international trade on the Healthy life of citizens of the country that engage in international trade. The United Nations in 2015 came up with Agenda 2030 which is a universal agenda aimed at eradicating poverty and achieving sustainable development of countries of the world, especially the Less Developed Countries. The UN Agenda 2030 highlighted the role of international trade as a powerful enabler of transformative shifts towards the achievement of sustainable development especially in Least Developed Countries (LDC) of the world including Nigeria (United Nations, 2015).

International trade, also referred to as foreign trade, is the exchange of capital, goods and services between two or more countries (Nwinee, 2021). Over the past several decades, the economies of the world have become greatly interconnected through international trade and globalization. Foreign trade statistics in 2014 by Economic Complexity Index (ECI) shows that Nigeria is the 119th most complex economy and the 41st largest export economy in the world. In 2013, Nigeria exported \$94.8B worth of goods and imported \$53.3B worth of goods, leading to favorable trade balance of \$41.6B. In the same year, the per capita GDP of Nigeria was \$5.6k and her GDP was \$521B. Further analysis of the components of export and import indicates that the top exports of Nigeria are Refined Petroleum (\$3.07 Billion), Cocoa Beans (\$561Million), Crude Petroleum (\$75.3Billion), Petroleum Gas (\$10.3 Billion), and Special Purpose Ships (\$463 Million), while her top imports are Wheat (\$1.42 Billion), Rolled Tobacco (\$1.34 Billion), Refined Petroleum (\$9.5 Billion), Cars (\$1.87 Billion), and Special Purpose Ships (\$1.01 Billion). Expressed in percentage, the exports are led by Crude Petroleum which stands for 79.4% of the total exports of Nigeria, followed by Petroleum Gas, which accounts for 10.9% whereas the imports are led by Refined Petroleum which accounts for 17.9% of the total imports of Nigeria, followed by



Cars, which contribute 3.51%. Nigeria recorded a trade surplus of N197, 187.70 million in September, 2015. Balance of Trade in Nigeria averaged N201, 370.76 million from 1981 until 2015, reaching an all-time high of N2,177,553.08 million in October of 2011. (CBN, 2014).

Like many other developing countries, Nigeria operates an open economy. The goal is to tap many of the benefits of trade as opined by the classical economists. The Nigerian government like many other developing countries considers trade as the main engine of its development strategies, because of the implicit belief that trade can create jobs, expand markets, raise incomes, facilitate competition and disseminate knowledge (Ogbaji & Ebebe, 2013). Nevertheless, while trade between countries may generate growth globally, there are no guarantees that its aggregate benefits are distributed equitably among trading partners. There are winners and losers in any trading relationship. Over the years, trade relations do not seem to result in great benefits as envisaged (Ajayi, 2003).

Life expectancy is a statistical measure of the average time an organism is expected to live, based on the year of its birth, its current age, and other demographic factors like sex. The most commonly used measure is life expectancy at birth (Shryoc & Siegel et al, 1973).

The combination of high infant mortality and deaths in young adulthood from accidents, epidemics, plagues, wars, and childbirth, before modern medicine was widely available, significantly lowers LEB.

However, trading partners may all gain at differing degrees. Many factors determine the extent to which a country may benefit from a trading relationship. These include the terms of trade a country faces in relation its trading partners, the international exchange rate among the traded goods and the market characteristics of the country's export goods (Eravwoke & Oyovwi, 2012).

Statement of the Problem

Nigeria has the biggest economy in Africa with a GDP of about \$500 billion. Despite this, Nigeria is still undeveloped despite her abundant human and material resources. Nigeria has a population of about 200 million and is faced with so many challenges which include poor infrastructure, power challenges, inadequate health facilities, poor educational system, high unemployment rate, insecurity and prevalence of every other indices indicative of an under developed nation. Few years ago, Nigeria was declared the poverty capital of the world which is a confirmation that all is not well with Nigeria and its citizens.

One of the major challenges confronting international trade in Nigeria is the country's balance of trade. A country's balance of trade is defined by its net exports (exports minus imports) and is thus influenced by all the factors that affect international trade. These include factor endowments and productivity, trade policy, exchange rates, foreign exchange reserves, inflation, and demand. An unfavourable balance of payment negatively affects international trade financing leading to deficit in foreign exchange required to fund developmental projects. Nigeria like most African countries are exporters of primary goods and do not contribute significantly to world trade as it is not a manufacturer of finished product which comes about through industrialization. This has made Nigeria not to gain maximally from International trade, a situation that can only change when Nigeria is able to diversify its economy and trade on finished products. Attempt by Nigerian government to diversify Nigeria's economy and set it on the path of sustained economic growth has led the government to series of external borrowing to fund economic development projects. There is concern that huge external borrowing made by the government of Nigeria in recent years may push Nigeria into a debt trap that will strangle its development efforts unless diversification of the economy is achieved with the borrowed funds, which brightens the chance of meeting up with the loan obligations as and when due.

Crude Oil is the main revenue earner for Nigerian government as it is the main product, by value and volume, traded by Nigeria in the international market. Nigeria is Africa's largest producer and exporter of crude oil and sixth largest oil producing country in the world with crude oil production capacity of 2.5 million barrels per day. Unfortunately, Nigeria is still importing refined petroleum product despite having three petroleum refineries with a combined production capacity of 445,000 bdp which is just about 18% of the daily crude oil production capacity. The current combined daily production of the three refineries operating in Nigeria are not able to meet the 305,000bpd daily domestic consumption requirement of the nation because of mismanagement and lack of maintenance of the refineries over the years. In order to bridge the shortfall in supply of refined petroleum products, the Nigeria National Petroleum Company (NNPC) embarked on massive importation of refined petroleum products. The importation of refined petroleum products takes big toll on the nations scarce foreign exchange reserve and negatively affects funding of economic development projects. The inability of the Nigeria government to diversify the economy and become a net exporter of finished goods instead has led to stunted



development and lack of improvement in the health and economic well-being of Nigerians. This study is an attempt to contribute in solving this problem by critically examining the impact of international trade on the health of Nigerians.

Aim and Objectives of the Study

The aim of this study is to determine the relationship between International Trade (with import, export, Foreign Direct Investment, and Exchange Rate as proxies) and life expectancy in Nigeria. The specific objectives of the study are to:

- (i) determine the relationship between import and life expectancy;
- (ii) ascertain the relationship between export and life expectancy;
- (iii) examine the relationship between foreign direct investment and life expectancy;
- (iv) determine the relationship between exchange rate and life expectancy;

Research Hypotheses

The following four null hypotheses were formulated for this study.

H₀.1. There is no significant relationship between import and life expectancy in Nigeria.

H₀.2. There is no significant relationship between export and life expectancy in Nigeria.

H₀.3. There is no significant relationship between foreign direct investment and life expectancy in Nigeria.

H₀.4. There is no significant relationship between exchange rate and life expectancy in Nigeria.

Significance of the Study

The significance of this study will be categorized into theoretical and practical significance.

This study is theoretically significant because the findings revealed the nature of the relationship between the various dimensions of international trade (import, export, foreign direct investment and exchange rate) and life expectancy in Nigeria. This study added to the body of knowledge in the area of International trade and healthy living in Nigeria. Future researchers in this area or related area can leverage on some information contained in this study thus contributing to knowledge and literature.

The practical significance of this study is apparent in view of the benefits to the Nigerian government and other stakeholders, derivable from the implementation of the recommendations of this study. The various stakeholders include government and its regulatory agencies and general public. Ultimately this study will help policy makers and government functionaries to seek ways of achieving improvement in life expectancy in Nigeria through formulation and implementation of appropriate policy and regulations on international trade.

LITERATURE REVIEW

The Concept of International Trade

The concept of trade between countries, which is referred to as international trade, arose in the 17th and 18th century centred on the doctrine of mercantilism. There are features that distinguish international trade from domestic trade. The basis of international trade lies in the diversity of economic resources in different countries. All countries are endowed by nature with the same production facilities. There are differences in climatic conditions and geological deposits as also in the supply of labour and capital. The standard theory of international trade is based on Adam Smith's postulations in his book *Wealth of Nations*, where he stated that, "If a foreign country can supply us with a commodity cheaper than we ourselves can make it, better buy it off them with some part of the produce of our own industry, employed in a way in which we have some advantage."

International Trade involves buying and selling of goods and services across countries. International trade is the exchange of capital, goods, and services across international borders or territories because there is a need or want of goods or services. In most countries, such trade represents a significant share of gross domestic product (GDP). A product that is transferred or sold from a party in one country to a party in another country is an export from the originating country, and an import to the country receiving that product. Imports and exports are accounted for in a country's current account in the balance of payments. Trading globally may give consumers and countries the opportunity to be exposed to new markets and products. Almost every kind of product can be found in the international market, for example: food, clothes, spare parts, oil, jewellery, wine, stocks, currencies, and water. Services are also traded, such as in tourism, banking, consulting, and transportation (Wikipedia, International trade).

While international trade has existed throughout history, its economic, social, and political importance has been on the rise in recent centuries. Carrying out trade at an international level is a complex process when compared to domestic trade. When trade takes place between two or more states factors like currency, government



policies, economy, judicial system, laws, and markets influence trade. To ease and justify the process of trade between countries of different economic standing in the modern era, some international economic organizations were formed, such as the World Trade Organization. These organizations work towards the facilitation and growth of international trade. Statistical services of intergovernmental and supranational organizations and governmental statistical agencies publish official statistics on international trade.

International trade is, in principle, not different from domestic trade as the motivation and the behavior of parties involved in a trade do not change fundamentally regardless of whether trade is across a border or not. However, in practical terms, carrying out trade at an international level is typically a more complex process than domestic trade. The main difference is that international trade is typically costlier than domestic trade. This is due to the fact that a border typically imposes additional costs such as tariffs, time costs due to border delays, and costs associated with country differences such as language, the legal system, or culture (non-tariff barriers). Another difference between domestic and international trade is that factors of production such as capital and labor are often more mobile within a country than across countries. Thus, international trade is mostly restricted to trade in goods and services, and only to a lesser extent to trade in capital, labour, or other factors of production. Trade in goods and services can serve as a substitute for trade in factors of production. Instead of importing a factor of production, a country can import goods that make intensive use of that factor of production and thus embody it. An example of this is the import of labor-intensive goods by the United States from China. Instead of importing Chinese labor, the United States imports goods that were produced with Chinese labor. One report in 2010, suggested that international trade was increased when a country hosted a network of immigrants, but the trade effect was weakened when the immigrants became assimilated into their new country (Wikipedia).

Nations trade internationally because of lack of resources or capacity to satisfy domestic needs. By developing and exploiting their domestic resources, countries can produce surplus. They may use this surplus to buy goods they need from abroad, i.e., through international trade. International trade has existed for more than 9,000 years. Long distance trade-before the existence of nation states and national borders-goes back much further. In fact, it goes back to where pack animals and ships first came onto the scene. Our modern industrialization world would not exist in countries did not import and export. Put simply; international trade is at the heart of today's global economy. Global interdependence is a fact of life for every country today.

The six basic reasons why trade may take place between countries are summarized below.

- A. Difference in Technology. Advantageous trade can occur between countries if the countries differ in their technological abilities to produce goods and services.
- B. Differences in Resources Endowments. Advantageous trade can occur between countries, if the countries differ in their endowments of resources. The factors mentioned in the resource endowments reason are described as follows :1) the uneven distribution of resources around the world is the one of the basic reasons why nations began and continue to trade with each other; 2). Favourable climatic conditions and terrain are very important for agricultural produces; 3) Natural resources; 4) skilled workers; 5) capital resources; 6) Favourable geographic location and transport costs;7)Insufficient production, some countries cannot produce enough items they need.
- C. Economic Resources: In addition to getting the products they need; countries also want to gather economically by trading countries.
- D. Differences in Demand: Advantageous trade can occur between countries if demands are preferences differing between countries?
- E. Existence if Economic s of Scale in Production: The existence of economics of scale of production is sufficient to generate advantageous trade between two countries.
- F. Existence of Government Polices: Government tax and subsidy programs can be sufficient to generate advantageous in production of certain products.

There are also other considerations that gave rise to international (or Foreign) trade such as; uneven distribution of natural resources; expansion of market for products; difference in taste; difference in skills; difference in climatic condition; desire to improve the standard of living and difference in efficient use of natural resources.

There are factors that affect international trade that is not noticeable in the domestic market. These factors pose as barriers to international trade. These are barriers resulting from difference in currency; difference in culture and beliefs; difference in language; distance; political instability; problem of documentation; transportation and communication; government policy; difference in legal system/emigration laws; difference in weight and measurement.

Dimensions of International Trade

There are various dimensions of international trade used by different scholars. This study used four dimensions



of international trade which are import, export, foreign direct investment and exchange rate.

Import

An import is a good or service bought in one country that was produced in another. Imports are a major component of international trade. Imports of goods and services represent the value of all goods and other market services received from the rest of the world. They include the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government services. They exclude compensation of employees and investment income (formerly called factor services) and transfer payments. If the value of a country's imports exceeds the value of its exports, the country has a negative balance of trade, also known as a trade deficit. Imports are important for the economy because they allow a country to have access and make use of certain products and services that is not produced locally or that is scarce and very expensive. Imports can also be used to bring in raw materials from other countries that is needed for production in the home country. Importing refers to buying goods and services from foreign sources and bringing them back into the home country.

In 2020 the top imports of Nigeria were Refined Petroleum (\$7.75B), Cars (\$3.03B), Wheat (\$2.15B), Packaged Medicaments (\$1.38B), and Telephones (\$771M). These goods were imported mostly from China (\$17.4B), Netherlands (\$4.58B), United States (\$4.49B), India (\$3.46B), and Belgium (\$1.99B) (Simoes & Hidalgo, 2021).

Export

Exports of goods and services represent the value of all goods and other market services provided to the rest of the world. They include the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government services. They exclude compensation of employees and investment income (formerly called factor services) and transfer payments. Importing refers to buying goods and services from foreign sources and bringing them back into the home country.

Nigeria is one of Africa's largest economies and its leading oil exporter, with the largest natural gas reserves. The country is a leader in various types of agricultural production, such as palm oil, cocoa beans, pineapple, and sorghum. It is the largest producer of sorghum in the world just after the United States, and ranks fifth in the production of palm oil and cocoa beans. The country's economic growth is mainly driven by strong performance in the agricultural, trade, telecommunications, manufacturing and the film industries.

The top exports of Nigeria are Crude Petroleum (\$30B), Petroleum Gas (\$5.89B), Scrap Vessels (\$1.29B), Special Purpose Ships (\$775M), and Refined Petroleum (\$613M). Nigeria's exports are mostly to India (\$6.27B), Spain (\$4.8B), China (\$2.54B), Netherlands (\$2.24B), and South Africa (\$2.17B) (Simoes & Hidalgo, 2021).

Foreign Direct Investment

Foreign direct investment refers to direct investment equity flows in the reporting economy. It is the sum of equity capital, reinvestment of earnings, and other capital. Direct investment is a category of cross-border investment associated with a resident in one economy having control or a significant degree of influence on the management of an enterprise that is resident in another economy. Ownership of 10 percent or more of the ordinary shares of voting stock is the criterion for determining the existence of a direct investment relationship. Foreign Direct Investment(FDI) is an investment made by a firm or individual in one country into business interests located in another country. Generally, FDI takes place when an investor establishes foreign business operation or acquires foreign business assets in a foreign company. Foreign direct investments are commonly made in open economies where you have skilled workforce and above average growth prospects for the investor, as opposed to tightly regulated economies. Most FDIs are more than capital investment as it usually includes provision of management or technology as well. The main feature of FDI is that it establishes effective control over the decision making of a foreign business. FDIs are distinguished from portfolio investments in which an investor merely purchases shares of foreign based companies. Thus FDIs are the physical investments and purchases made by a company in a foreign country, typically by opening plants and buying buildings, machines, factories and other equipment in the foreign country. These types of investments are preferred and favored because they are generally considered long-term investment and helps boost the economy of the host country (Chen, 2020).

In 2020 the total inflow of foreign direct investment to Nigeria stood at \$2.40Billion. An overview of the trend



in foreign direct investment for the last few years is as follows;
Nigeria foreign direct investment for 2019 was \$2.31B, a 197.34% increase from 2018.
Nigeria foreign direct investment for 2018 was \$0.78B, a 67.87% decline from 2017.
Nigeria foreign direct investment for 2017 was \$2.41B, a 30.12% decline from 2016.
Nigeria foreign direct investment for 2016 was \$3.45B, a 12.7% increase from 2015.
(World Bank –WDI data).

Foreign direct investment is significant for economic growth in developing countries like Nigeria because it affects the economic growth and development by stimulating domestic investment, capital formation expansion and the advancement of technology transfer in the host countries (Falki, 2021). Foreign direct investment also has positive impact on human development index. Government bodies should be well aware of this relationship and ensure that growth persists economically, socially, or politically. This ensures that its citizens enjoy decent living standards and long healthy lives (Almozaini, 2022).

The inflow of Foreign Development Investment (FDI) into host countries brings considerable benefits, such as a direct external source of capital, the transfer of advanced technologies, and better management practices. Capital is regarded as the driving force of economic growth and development, and hence the FDI bringing in the capital in the countries allows further economic growth and development (Mollaesmaeili et al., 2012). Various studies show that there is a solid and positive relationship between FDI and HDI; however, according to Ngo (2021), these positive outcomes are not always guaranteed.

Exchange Rate

The foreign exchange rate is the price of one currency in terms of another. It can also be seen as the amount of foreign currency that can be bought with one unit of the local or domestic currency or cost in domestic currency of purchasing one unit of the foreign currency. The venue where foreign exchange activities takes place constitutes the foreign exchange market.

In the foreign exchange market, two foreign exchange rates are usually quoted by dealers. The rate at which the foreign currency is offered for sale which is referred to as the bid price and the lower rate at which the foreign currency will be purchased which is referred to as the ask price. The difference between the bid price and the ask price constitutes the ‘spread’ which is the gross profit margin of the dealer. Foreign exchange market facilitates international trade and the key participants in the foreign exchange markets are commercial banks, foreign exchange brokers, monetary authorities and other authorized dealers (Olulu, 2003).

Nigeria has over the years adopted different exchange rate policies that included fixed exchange rate, floating exchange rate and managed exchange rate which we are currently practicing. The Nigeria’s exchange rate has been on the decline as the currency has been losing its value against the US dollars and other major world currencies. As at 1981 \$1 exchanged for N0.61 (ie 61k). In 1990 \$1 exchanged for N8.04, in 2000 \$1 exchanged for N102.11; in 2010 \$1 exchanged for N150.30; in 2020 \$1 exchanged for N358.51. The trend in the decline in the exchange rate of the Naira to the Dollar and other major currencies has continued up to 2022.

Life Expectancy

Life expectancy is a measure of healthy life which is one of the dimensions of human development index (HDI). It is a statistical measure of the average time an organism is expected to live, based on the year of its birth, its current age, and other demographic factors like sex. The most commonly used measure is life expectancy at birth (Shryoc & Siegel et al, 1973).

There are various reasons that affect the life expectancy of citizens of a country. The combination of high infant mortality and deaths in young adulthood from accidents, epidemics, plagues, wars, and childbirth, before modern medicine was widely available, significantly lowers LEB. The life expectancy for people reaching adulthood is greater because it ignores infant and child mortality.

There are great variations in life expectancy between different parts of the world, mostly caused by differences in public health, medical care, and diet. Life expectancy in many African countries was impacted by AIDS. Illnesses and health status of the population impacts on life expectancy. Consequently, public health measures can enhance life expectancy (CDC, 1999). Another factor that affects life expectancy is economic circumstances. For example, in the United Kingdom, life expectancy in the wealthiest and richest areas is several years higher than in the poorest areas. Fletcher (2013) conducted a research on life expectancy and found a pronounced relationship between economic inequality and life expectancy. Other factors affecting an



individual's life expectancy are genetic disorders, drug use, tobacco smoking, excessive alcohol consumption, obesity, access to health care, diet, and exercise.

Gender can also account for variations in life expectancy. In the present world female human life expectancy is greater than that of males, despite females having higher morbidity rates. Men are also more likely to die from injuries, whether unintentional (such as occupational, war or car accidents) or suicide (WHO,2004). The difference in life expectancy between men and women in the United States was 5.3 years in 2005. United Nations statistics from mid-twentieth century onward, show that in all parts of the world, females have a higher life expectancy at age 60 than males (United Nations, 2015). Education on all levels has been shown to be strongly associated with increased life expectancy. This association may be due partly to higher income, which can lead to increased life expectancy. Pre-school education also plays a large role in life expectancy. It was found that high-quality early-stage childhood education had positive effects on health (Campbell et al, 2014).

An analysis of trend in Nigeria's life expectancy for the period of 20 years (2000 to 2020) at interval of five years shows a consistent increase, from life expectancy of 46.27 years in 2000 to 55.02 in the year 2020 (World Bank Data).

Theoretical Literature

Theory of International Trade

The theories of international trade include; the classical theories which includes theory of absolute advantage, comparative advantage theory, the neo-classical theory - factor endowment theory (Heckscher- Ohlin theory) and the contemporary theories of international trade.

The classical trade theory rests on certain basic assumptions which are as follows:

- i. That there are two countries engaged in international trade.
- ii. That two commodities only are involved in the trade
- iii. That there is fixed resources of labour and labour is the only factor of production in both countries.
- iv. That the production process exhibits constant returns to scale.
- v. That perfect competition prevails in all factor and product markets.

Potters (2021) described absolute advantage as the ability of an individual, company, region, or country to produce greater quantity of a good or service with the same quantity of inputs per unit of time, or to produce the same quantity of a good or service per unit of time using a lesser quantity of inputs than another entity that produces the same good or service. Thus, an entity with an absolute advantage can produce a product or service at a lower absolute cost per unit using a smaller number of inputs or a more efficient process than another entity producing the same good or service. The concept of absolute advantage was developed by Adam Smith in his book "Wealth of Nations" to show how countries can gain from trade by specializing in producing and exporting the goods that they can produce more efficiently than other countries.

The comparative advantage theory by David Ricardo (1772-1823) came about as a result of some defects noticed in the absolute advantage theory. David Ricardo believes that even if a nation has absolute disadvantage in the production of the two commodities traded on with respect to the other nations, mutually advantageous trade can still take place between the two nations. This can be achieved when the less efficient nation specializes in the production and export of the commodity in which its absolute disadvantage is less. This in other words is the commodity in which the nation has a comparative advantage. Consequently, the country should be prepared to import the commodity in which its absolute disadvantage is greater. It therefore means that countries should specialize in the production of the commodities they can efficiently produce, in the end, the countries involved in external trade will be better off (Olulu, 2003).

The Heckscher-Ohlin theory of international trade also referred to as factor endowment theory is the main variant of the modern or neo-classical theory of international trade. Factor Endowment Theory (Heckscher-Ohlin Trade Theory) states that the single most important cause of international differences in marginal opportunity cost, and hence trade, is the differences in relative factor endowment environmental conditions and factor prices between nations as the most important cause of trade. The theory explained differences in relative factor endowment among countries to international differences in relative factor supplies, differences in production, function between nations and differences in the pattern of demand in various countries (Olulu, 2003).

The Heckscher-Ohlin theorem is based on certain assumptions which are:

- i. That there are two countries, two commodities and two factors of production.



- ii That the supplies of factors are fixed, and do not grow internally or through migration either exogenously or in response to trade.
- iii That perfect competition prevails in all product and factor markets.
That there is no cost of transportation or information in carrying on trade.
- iv Government do not interfere with free trade through tariffs, quotas, taxes or any other regulations.
- v That all production functions are homogeneous to degree one. That is all production functions face constant return to scale.
- vi The theory of natural and acquired advantages was modified. In its place the trade advantage was explained in terms of factor endowment with the neo classical production theory.
- vii The labour theory of value was replaced with monetary evaluation of productions costs involving land, labour and capital.

The expectation or prediction of the Heckscher-Ohlin theorem is that countries should export commodity produced with its relatively abundant and cheap factor and import commodities the productions of which will require the use of a great deal of its relatively scarce and expensive factors. By this theorem the authors believe that efficiency of the free market will lead to maximization of worlds welfare. The Heckscher Ohlin theory was adopted for this study because its postulation on factor endowment as basis for international trade is in line with the Nigerian international trade experience.

Human Development Theory

Human development theory is a theory which uses ideas from different origins, such as ecology, sustainable development, feminism and welfare economics. It wants to avoid normative politics and is focused on how social capital and instructional capital can be deployed to optimize the overall value of human capital in an economy.

Amartya Sen and Mahbub ul Haq are the most well-known human development theorists. The work of Amartya Sen is focused on capabilities: what people can do and be. It is these capabilities, rather than the income or goods that they receive (as in the Basic Needs approach), that determine their well-being. This core idea also underlies the construction of the Human Development Index, a human-focused measure of development pioneered by the UNDP in its Human Development Reports; this approach has become popular the world over, with indexes and reports published by individual counties, including the American Human Development Index and Report in the United States. The economic side of Sen's work can best be categorized under welfare economics, which evaluates the effects of economic policies on the well-being of peoples. Sen wrote the influential book *Development as Freedom* which added an important ethical side to development economics.

Empirical Review

Hamid and Amin (2013) in carried out a research work titled "Trade and Human Development in OIC Countries: A Panel Data Analysis," The study examined the relationship between trade and the OIC countries' social developments as measured by the Human Development Index (HDI). The generalized method of moments (GMM) procedure in a panel data distributed lag model was used for the years 1980 to 2005, with a five-year increment. Also annual data was used from 2000 to 2009. The research addressed two questions which are: (i) whether trade has a positive relationship with human development as reflected by longevity, educational attainment and income in the HDI measurement, and (ii) whether trade still has a positive relationship with human development, when the income component of the HDI is excluded. Comparisons are made across OIC countries based on three World Bank Classifications by Income, namely, high income, middle income and low income countries. The findings of the research showed that trade is has a significant positive relationship with HDI for all income categories, but insignificant relationship with non-income HDI. The finding indicates that trade is associated with human development only through income channels, and it is not associated with other components, such as longevity (which is measured using life expectancy), literacy level and educational attainment.

A study carried out by Herzer (2015) investigated the long-run effect of trade on life expectancy in the United States. This note analyses the long-run impact of trade on population health by applying co-integration techniques to US time series data for the period 1960 to 2011. Despite the concerns of many commentators and observers, it is found that trade has a positive and significant long-run impact on population health, as measured by life expectancy.

Grace Mbabazi (2017) conducted a study on the impact of trade on human development in sub-Saharan Africa. The study examined the impact of trade on income, education and life expectancy in Sub-Saharan Africa. The



research method used was the generalized method of moments (GMM) approach in a panel data setting comprising 34 countries over a period of 11 years from the period 2004 to 2014. Trade is the independent variable while human development is the dependent variable. The components of the dependent variable are GNI per capita, enrollment in secondary school and life expectancy while that of the independent variable are gross capital formation per capita and labor force. Data analysis was carried out using the System-GMM estimator developed for dynamic panel data models. The findings of the study revealed that growth in trade enhances growth in income, education and longevity in Sub-Saharan Africa. The study recommended that countries can promote human development by reducing tariffs and non-tariff trade barriers and by implementing other policies that facilitate trade.

Ochinanwata et al., (2020) conducted a study titled Does External Trade Improve Life Expectancy? A Long Run Equilibrium Analysis on English Speaking West African Countries. The study specifically examined the relationship between external trade and life expectancy among English speaking West African Countries (EsWACs). Prior studies on this subject concentrated on structuring predictive models using mortality trend or building parameter life expectancy with samples of individuals; but none has considered the vestiges of underdevelopment that have led to reduced life expectancy overtime in the developing economies even in the face of increase in the volume of trade. It therefore departs methodologically from the classical ordinary least square (OLS) and 1st generation panel econometric techniques in constructing balanced panel data structure then employed second generation panel data econometric techniques. The results show that external trade has not improved life expectancy in EsWACs. This therefore infers that the impact of external trade on healthcare is negligible and has infinitesimal effect on life expectancy in the sub-region.

Base and Kalayci (2021) conducted a study titled “Relationship between Life Expectancy, Foreign Direct Investment and Trade Openness: Evidence from Turkey.” The study investigated the relationship between life expectancy, foreign direct investment and trade openness for Turkey for the period 1974 to 2017. The long run relationship between variables was analyzed using ARDL (Autoregressive Distributed Lag) model. Short run and long run causal relationships between variables are analyzed by VECM (Vector Error Correction) model. Nonlinear ARDL model is also used to analyze the non-linear relationships between the variables. According to the results of the study, long run relationship was found to exist between the variables, and foreign direct investment affects significantly and positively life expectancy in the long run. No causal relationship from foreign direct investment and trade openness to life expectancy is found in the long run and in the short run. Trade openness does not significantly affect life expectancy in the long run.

METHODOLOGY

Research Design

Researches such as this, which involves testing of hypotheses of the relationship between variables require a design which permits inferences in addition to minimization of bias and maximization of reliability (Kothari & Garg, 2015). This study adopted the Ex-Post Facto research method. Time series data spanning a period of 40 years (1981-2020) was used to investigate the relationship between the independent variable (international trade) and the dependent variable (human development). The study was based on secondary data sourced from official websites and statistical bulletins of Central Bank of Nigeria, World Bank, United Nations and its agencies.

Model Specification

The dependent variable used in this study is life expectancy while the independent variable is International Trade. The proxies for international trade are import(IMPT), export(EXPT), foreign direct investment(FDI) and exchange rate (EXR).

The simple regression equation is stated thus;

$$Y = B_1 + B_2X + U \dots\dots\dots (1)$$

Where, Y =dependent variable; X =explanatory (or dependent) variable; B1 =intercept of Y; B2 =slope coefficients; U =stochastic variables (Gujarati, 1995). We write the functional equation of the model as follows:

$$LE = f(IMPT, EXPT, FDI, EXR)\dots\dots\dots(2)$$

Where LE is life Expectancy; IMPT, EXPT, FDI, and EXR are import, export, foreign direct investment, and exchange rate respectively for the independent variable.

Therefore, in writing the model equation using the symbols of the variables we have

$$\text{Model : } LE = \beta_1 + \beta_2(\text{IMP}) + \beta_3(\text{EXP}) + \beta_4(\text{FDI}) + \beta_5(\text{EXR}) + U \dots\dots\dots(3)$$

Where,

LE = Life Expectancy

IMPT = Import



EXPT	=	Export
FDI	=	Foreign Direct Investment
EXR	=	Exchange Rate
β_1	=	Constant (Intercept)
β_2 - β_5	=	Coefficients of Independent Variables
U	=	Error Term (Stockastic variables).

The model (LE) is shown in Equation 3 above, with Life Expectancy(LE) as the dependent variable. The independent variables are import(IMPT), export(EXPT), foreign direct investment(FDI) and exchange rate (EXR). β_1 is the model constant which corresponds to the intercept on the dependent variable(LE), β_2 - β_5 are the coefficients of the independent variables and U is the stochastic variable or the error term of the life expectancy model. The apriori expectation is that import, export, foreign direct investment and exchange rate are expected to have significant effect on life expectancy. Mathematically, $\beta_2, \beta_3, \beta_4, \beta_5$ are all assumed to be greater than zero.

Method of Data Analysis

Data analysis was carried out using various techniques. Firstly, after collation and presentation of the variable data covering the period under study (1981 to 2020), the characteristics of the data and the variable trend were analysed. Descriptive statistical analysis of the individual variables was carried out to identify the characteristics of the variables. The statistical tests that were performed during data analysis included Unit Root Test for stationarity of data using Augumented Dickey Fuller Test(ADF); Auto Regressive Distributive Lag (ARDL) Test used to establish the presence of short run and long-run relationship between the variables; and Error Correction Estimation Model test. Post estimation tests included serial correlation test, Wald test and multicollinearity test. Data analysis was done with the aid of E-View version 10 software.

RESULTS AND DISCUSSION

Descriptive Statistics of Variables

The descriptive statistics of the variables refer to the mean, median, standard deviation, skewness and kurtosis of the variables. The result of the descriptive statistics of all the variables in the study were obtained during data analysis are shown in table 1.

Table 1: Descriptive Statistics of Variables

	LE	IMPT	EXPT	FDI	EXR
Mean	48.44550	28.17800	36.49800	2.487250	100.8727
Median	46.39000	15.81000	21.54000	1.270000	107.0250
Maximum	55.02000	88.74000	143.7000	8.840000	358.8100
Minimum	45.64000	2.130000	2.880000	0.190000	0.610000
Std. Dev.	3.170900	27.35271	36.43880	2.576219	100.7593
Skewness	0.835567	0.779240	1.291445	1.176713	0.885311
Kurtosis	2.141455	2.175640	3.875194	3.151209	2.987528
Jarque-Bera	5.882982	5.180715	12.39548	9.269124	5.225433
Probability	0.052787	0.074993	0.002034	0.009710	0.073335
Sum	1937.820	1127.120	1459.920	99.49000	4034.910
Sum Sq. Dev.	392.1296	29178.65	51783.66	258.8392	395945.2
Observations	40	40	40	40	40

Source: Research Data Computation, E-view output of Descriptive Statistics of Variables

Table 1 shows that the minimum value of life expectancy is 45.64 which was recorded in 1981 while the maximum value of life expectancy is 55.02 which was recorded in 2020. The mean value of life expectancy is 48.45 with a standard deviation of 3.17. The skewness and kurtosis are 0.84 and 2.14 respectively which are both positive. The skewness test result for life expectancy showed positive value meaning that it has high tail. Using kurtosis benchmark of 3, it showed that life expectancy with kurtosis value of 2.14 is more on the positive side and is not symmetrical. A critical examination of the result showed that the mean is greater than the standard deviation which is an indication of data consistency. The probability of Jarque-Bera statistics suggests that the null hypothesis of normal distribution for life expectancy is accepted as Jarque-Bera value of 5.883 with probability of 0.053 is greater than 0.05 at 5% level of significance.



Import is one of the proxies for international trade which is the independent variable of this study. Table 1 shows that the minimum value of import is \$2.13 which was recorded in 1986 while the maximum value of import is \$88.74 which was recorded in 2019. The mean value of import is \$28.18 with a standard deviation of \$27.35. A critical examination of the result showed that the mean is greater than the standard deviation which is an indication of data consistency. The skewness and kurtosis are 0.78 and 2.18 respectively which are both positive. The skewness test result for import showed positive value meaning that it has high tail. Using kurtosis benchmark of 3, it showed that import with kurtosis value of 2.18 which is positive but less than 3 can be described as platykurtic relative to normal and is not symmetrical. The probability of Jarque-Bera statistics suggests that the null hypothesis of normal distribution for import is accepted as Jarque-Bera value of 5.18 with probability of 0.07 is greater than 0.05 at 5% level of significance.

Export is one of the proxies for international trade which is the independent variable of this study. The result in Table 1 shows that the minimum value of export is \$2.88 billion which was recorded in 1986 while the maximum value of export is \$143.70 billion which was recorded in 2012. The mean value of export is \$36.50 with a standard deviation of \$36.44. The skewness and kurtosis are both positive and have values of 1.29 and 3.88 respectively. The skewness test result for export showed positive value meaning that it has high tail. Using kurtosis benchmark of 3, it showed that export with kurtosis value of 3.88 which is positive and greater than 3 can be described as leptokurtic relative to normal and is not symmetrical. The probability of Jarque-Bera statistics suggests that the null hypothesis of normal distribution for export is rejected at 5% level of significance as Jarque-Bera value of 12.40 with probability of 0.002 is less than 0.05.

Foreign direct investment has minimum value of \$190 million in 1984 while the maximum value of foreign direct investment is \$8.84 billion which was recorded in 2011. The mean value of foreign direct investment is \$2.49 with a standard deviation of \$2.58. A critical examination of the result showed that the mean is less than the standard deviation which is an indication of lack of data consistency. The skewness and kurtosis are both positive and have values of 1.18 and 3.15 respectively. The skewness test result for foreign direct investment showed positive value meaning that it has high tail. Using kurtosis benchmark of 3, it showed that foreign direct investment with kurtosis value of 3.88 which is positive and greater than 3 can be described as leptokurtic relative to normal and is not symmetrical. The probability of Jarque-Bera statistics suggests that the null hypothesis of normal distribution for foreign direct investment is rejected at 5% level of significance as Jarque-Bera has value of 9.27 with probability of 0.01 which is less than 0.05.

The minimum value of exchange rate of \$1 to N0.61 was recorded in 1981 while the maximum value of exchange rate of \$1 to N358.81 was recorded in 2020. The mean value of exchange rate is N100.87 to \$1.00 with a standard deviation of 100.76. A critical examination of the result showed that the mean is almost equal to the standard deviation which is cast doubt on data consistency. The skewness and kurtosis are 0.89 and 2.99 respectively which are both positive. The skewness test result for exchange rate showed positive value meaning that it has high tail. Using kurtosis benchmark of 3, it showed that exchange rate with kurtosis value approximately equal to 3 is normally distributed and is recognized as mesokurtic. The probability of Jarque-Bera statistics suggests that the null hypothesis of normal distribution for exchange rate is accepted as Jarque-Bera has value of 5.22 with probability of 0.07 which is greater than 0.05 at 5% level of significance.

ARDL Tests Results

ARDL Long Run Tests Results

The ARDL long run test results of International trade and life expectancy is shown in Table 1.

Table 1: ARDL Long Run Test for Model 1

Variable	Coefficient	Std Error	t-Statistics	Prob
IMPT	-0.263887	0.258358	-1.021402	0.3199
EXPT	0.105096	0.110610	0.950150	0.3540
FDI	1.404178	1.087852	1.290780	0.2123
EXR	0.103080	0.05110	0.059110	0.0973

Source: Researchers computation. Extracts from E-view 10 Output

* Level of significance at 5%

The estimated ARDL long run coefficients results shown in Table 1 revealed that the coefficient of import is -0.263887 which is negatively signed with life expectancy while export, foreign direct investment and exchange rate all have positive coefficients of 0.105, 1.404 and 0.103 respectively, with life expectancy. This shows the existence of some level of relationship between the independent variables and life expectancy. However, the probability of t-statistic of all the independent variables are greater than 0.05 at 5% level of significance



meaning that import, export, foreign direct investment and exchange rate do not have any significant long run relationship with life expectancy.

ARDL Short Run Tests Results

The results of ARDL Short-run Estimate for Life Expectancy is shown in Table 2.

Table 2: ARDL Short-run Estimate for Life Expectancy

Variables	Coefficient	Std Error	t-Statistics	Prob
D(IMPT)	-0.005348	0.002174	-2.460025	0.0236
D(IMPT(-1))	0.002305	0.001642	1.403830	0.1765
D(IMPT(-2))	-0.00663	0.002175	-0.304864	0.7638
D(EXPT)	0.001757	0.000979	1.794230	0.0887
D(EXPT(-1))	-0.002015	0.001048	-1.923513	0.0695
D(EXPT(-2))	-0.001766	0.000893	-1.977459	0.0625
D(FDI)	0.030539	0.010738	2.844115	0.0104
D(FDI(-1))	-0.028478	0.011834	-2.406448	0.0264
D(FDI(-2))	0.0048359	0.015078	0.322288	0.7508
D(EXR)	0.000981	0.000781	1.255984	0.2243
D(EXR(-1))	-0.002927	0.000862	-3.435824	0.0028
D(EXR(-2))	-0.002294	0.000862	-2.660789	0.0154
C	1.893594	0.093897	20.16663	0.0000
ECM(-1)	-0.042415	0.002253	-18.82412	0.0000

Adj R² = 0.929860, F-Stat = 37.71197 (0.000000), DW = 1.974472

Source: Research Data Computation. Extracts from E-view version 10 output.

* Level of significance at 5%

Table 2 shows the short-run estimates of international trade and life expectancy. Import in the current year has coefficient of -0.005348 with probability of 0.0236 which is less than 0.05 at 5% level of significance. This indicates a negative and significant short run relationship between import and life expectancy.

The current year lag coefficient of export is positive while the previous and second year lag coefficients of total export (EXPT) are both negative with p-values that are all greater than 0.05 at 5% level of significance. Hence there is no significant short run relationship between export and life expectancy in Nigeria.

The coefficient of foreign direct investment (FDI) is 0.030539 with p-value of 0.0104 which is less than 0.05 at 5% level of significance. This indicates a positive and significant short run relationship with life expectancy in Nigeria. Finally, exchange rate ((EXR) revealed a negative coefficient for the previous and second year with p-values of 0.003 and 0.015 respectively which are both less than 0.05 at 5% level of significance. This indicates a negative and significant short run relationship between exchange rate and life expectancy in Nigeria.

The ECM (-1) which is the error correction term has a coefficient of -0.042415 with p-value of 0.0000 which is negative and also significant at 0.05 level of significant. It indicates that the model adjusts toward long run equilibrium at a speed of 4.2% annually. This implies that the previous year's error can be corrected with an adjustment speed of 4.2% annually. The adjusted R-Square (R²) value of 0.929860 indicates that 93% of the total variation in the dependent variable, life expectancy, is explained by the independent variables (IMPT, EXPT, FDI & EXR) which means that the model is a good fit.

The finding of this study is partially in agreement with earlier works carried out by Ochinanwata et al (2020), Mbabazi (2017), Base and Kalayci (2021) and Herzer (2015).

CONCLUSION AND RECOMMENDATIONS

Conclusion

The findings of this study revealed that though long run relationships appear to exist between international trade and life expectancy, the relationships are not significant at 5% level of significance.

Nigeria's import has a negative and significant short run relationship with life expectancy at birth. This study found out that export has no significant relationship with life expectancy both in the short and long run. Foreign direct investment was found to have positive and significant short run relationship with life expectancy. Foreign direct investment impacts positively and significantly on life expectancy in Nigeria. Increase in foreign direct investment therefore leads to increase in life expectancy in Nigeria. Exchange rate of our local currency, the



Naira, was found to have a negative and significant short run relationship with life expectancy. The implication is that as the exchange rate increases life expectancy decreases.

Finally, the study revealed that there is a significant short run relationship between three out of four proxies of international trade with life expectancy in Nigeria. The three proxies of international trade that showed significant relationship with life expectancy are import, foreign direct investment and exchange rate. Export did not show any significant relationship with life expectancy. The study therefore concludes that there exists a significant short run relationship between international trade and life expectancy in Nigeria.

Recommendations

Based on the findings and conclusions of this study the following recommendations are made

1. Since import was found to negatively impact on life expectancy, the Nigeria government should strengthen the capacity and effectiveness of its regulatory agencies responsible for monitoring imports such as Customs, Nigeria Standard Organization and NAFDAC to ensure their effective and efficient operations. All efforts should be made to ensure that prohibited goods, sub-standard products and goods that do not meet the minimum requirement in terms of standard, quality, health and environmental considerations are not imported into the country. These agencies should be equipped with the latest technology required to enhance their operation, ensure collection of appropriate duties and enforce ban on prohibited and substandard goods.
2. This study showed that Nigeria's export does not have any significant relationship with life expectancy in Nigeria. This may be as a result of the very low value of Nigeria's export, less than \$40 billion in 2020, when compared with the population and the size of Nigeria's economy. Boosting Nigeria's annual export significantly to about \$200B will likely lead to a positive impact on life expectancy in Nigeria.
3. Foreign direct investment was found to have a positive and significant relationship with life expectancy. The study recommends that government should put in place policies that will help to increase the level of foreign direct investment in Nigeria which dropped drastically from a peak value of \$8.84 billion in 2011 to a value of \$2.40 billion in 2020.
4. Considering the negative impact of exchange rate on life expectancy, the Central Bank of Nigeria should continue to protect and hedge the Naira against sustained devaluation pressure so that the value of the naira does not fall below unacceptable levels. CBN should intervene and encourage local manufacturers, through access to finance, to boost their production and export of their products so as to earn foreign exchange. For Nigeria to make real progress it has to export more than it imports so as to have favourable balance of trade which will help to improve our exchange rate.

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