

**EFFECTS OF TRADE LIBERALIZATION ON AGGREGATE AND AGRICULTURAL  
SECTOR EMPLOYMENT IN NIGERIA**

**ADEDAPO SAMUEL ADEOGUN**

Bachelor of Agriculture (Agricultural Economics), Obafemi Awolowo University, 2015

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**ADEDAPO SAMUEL ADEOGUN**

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Dr. Bahareh Mosadegh Sedghy	Assistant Professor	Ph.D.
Dr. Alexander Bilson Darku Thesis Co-Supervisors	Associate Professor	Ph.D.
Dr. Danny Le Roy Thesis Examination Committee Member	Associate Professor	Ph.D.
Dr. Luis Escobar Thesis Examination Committee Member	Assistant Professor	Ph.D.
Dr. Temidayo O. Akinbobola External Examiner Obafemi Awolowo University, Nigeria	Full Professor	Ph.D.
Dr. Ebenezer Asem Chair, Thesis Examination Committee	Associate Professor	Ph.D.

## **DEDICATION**

This work is dedicated to the Almighty GOD who has given me the privilege to achieve this dream of studying abroad. I expressed this desire to Him quietly in 2015 and today it has become a reality.

I also dedicate this work to my beloved wife, Dr. Doyinfunmi Adeogun and my child- Jessica Adeogun. Words fail me to express how much I love you both!

## ABSTRACT

One deleterious problem plaguing most developing countries like Nigeria is unemployment and free trade has been identified as a panacea by many studies. However, proponents of protectionism argue that the agricultural sector should be shielded from international trade competition. Since the agricultural sector is a major employment driver in Nigeria, the objective of this study is to investigate the impact of trade liberalization on aggregate and agricultural sector employment in Nigeria. Using multiple linear regression (MLR) with trade and employment data from 1991 – 2020, the study found that although trade openness increased employment in the agricultural sector, it had no significant effect on total unemployment. Also, the agricultural share of the GDP does not significantly affect aggregate employment. Furthermore, foreign direct investments promote aggregate employment while having a negative impact on the agricultural sector employment. The study recommends that trade openness be promoted to further improve the agricultural sector.

**Keywords:** Nigeria; Unemployment; Trade Liberalization; Agriculture; Protectionism

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## LIST OF ABBREVIATIONS

ACP	African, Caribbean, and Pacific
ADB	Asian Development Bank
CBN	Central Bank of Nigeria
ECOWAS	Economic Communities of West African States
EPA	Economic Partnership Agreements
EU	European Union
FDI	Foreign Direct Investment
GATT	General Agreement on Trade and Tariff
ILO	International Labor Organization
IMF	International Monetary Fund
MNCs	Multinational Corporations
NBS	National Bureau of Statistics
NEITI	Nigeria Extractive Industries Transparency Initiative
OPEC	Organization of Petroleum Exporting Countries
SAP	Structural Adjustment Programme
USA	United States of America
VAR	Vector Autoregressive
VECM	Vector error correction model
WDI	World Development Indicators
WTO	World Trade Organization

## **CHAPTER 1: INTRODUCTION**

### **1.1 Background of Study**

One of the significant problems plaguing most nations, especially developing economies, is unemployment (Fatukasi, 2011; Ayinde et al., 2016; Maku & Alimi, 2018). According to statistics from International Labor Organization (ILO, 2020), about half a billion people globally are unemployed or underemployed. Besides, youth unemployment is a significant concern (Agu, 2013; ILO, 2020). A whopping sum of 267 million young people (between ages 15-24 worldwide) are studying, jobless, or at least engaged in menial work (ILO, 2020). This pitiable state of unemployment has been described as threatening to global development (ILO, 2013; Sipahutar, 2016; Kalu, 2021). Although unemployment is a global problem, it is more apparent and worsening in developing countries such as Nigeria. Despite its extensive human capital, mineral, and natural resources the government has failed in translating its rich endowments into economic growth that benefits the masses (Standing, 1983). Thus, the levels of unemployment have increased from 18.8% to 33.3% from the third quarter of 2017 to the fourth quarter of 2021 (NBS, 2017a, b; 2021).

Prior to its independence, Nigeria's economy was mainly agricultural. Agriculture contributed over 50 percent of the gross domestic production (GDP) around 1960 (Izuchukwu, 2011). The discovery of oil and its immediate economic potential in the 1970s led to the neglect of agriculture as the primary economic lifeline for Nigeria. The oil boom has both its merits and demerits. For example, the oil sector aided the country in recovering from the setbacks induced by the civil war, which lasted from 1966 to 1969. The government used proceeds from the oil sector to finance rapid industrialization, consequently providing job opportunities for the youths (Effoduh, 2016).

The oil boom made many previously employed in the agricultural sector emigrate massively into the country's urban centers in search of greener pastures and white-collar jobs (Oloni et al., 2017). However, the fall in oil prices caused by a reduction in the world demand for oil which began in 1975, made many youths who left the agricultural sector become unemployed. This experience indicates that the oil sector cannot generate sustainable income and employment for the economy. In addition, the benefits of the growth in the oil sector have not reached the rural poor (Oloni, 2013).

According to the Asian Development Bank (ADB, 2011), inclusive growth, as a solution to unemployment, has recently attracted attention in Nigeria and has become a topic of interest in the world development agenda. Inclusive growth can be seen as output growth that spans decades, positively impacts different economic sectors, reduce poverty, and engages most of the labor force (Samans et al., 2015). To achieve this, the advocates propose that more investments should be made in the sectors that can generate sustainable income for everyone, irrespective of their social strata (Chang, 2014). In Nigeria, the agricultural sector has been recognized as one of these sectors (Babatunde et al., 2012; Oloni et al., 2017). However, the inclusive growth concept is still ambiguous and challenging to measure. It is arguable whether inclusive growth is a means to address unemployment or an end when the unemployment problem is solved. Undoubtedly, Nigeria's agricultural sector is more inclusive than the oil sector. For example, despite the setbacks to the farming sector, by the second quarter of 2020, agriculture has contributed 24.6 percent, while the oil sector contributed only 8.93 percent to the real GDP of Nigeria (NBS, 2020). Also, agriculture has a proven record of contributing more to poverty reduction and inclusive growth than the oil sector (Kanu et al., 2014; Oloni et al., 2017).

This is why the government instituted the myriads of intervention programs such as National Accelerated Food Production (NAFP), Agricultural Development Projects (ADPs), National Centre for Agricultural Mechanization (NCAM), Nigerian Agricultural Insurance Company (NAIC) and Structural Adjustment Program (SAP) among others (Ugwu & Kanu, 2012; Olukunle, 2013). The objectives of these programs are to improve the volume of profitable commercial crops, bring development into the agricultural sector through the setting up of infrastructure, mechanize Nigeria's agriculture, provide risk cover to Nigerian farmers, adjust the country's economic structure, and improve international competitiveness (Evbuomwan, 1997; Auta & Dafwang, 2010; Ogbonna, 2012). Notwithstanding, the contribution of agriculture to aggregate employment in the country reduced over the years. Employment in agriculture, which was 50.57 percent of total employment in 1991, reduced to 34.66 percent of total employment in 2020 (World Bank, 2022). This emphasizes the need for a more critical, holistic, and individualistic approach to solving this problem, especially considering the abundant endowments in the country.

It opens room for trade liberalization advocates to state that agriculture should also be treated like other sectors of the economy. Proponents of trade liberalization in agreement with trade theories argue that foreign competition due to openness will improve productivity. Also, openness will encourage specialization, increased outputs, efficient use of factors of production, increased wages, and consequently improve employment.

However, trade liberalization in the agricultural sector is subject to contentious debates as some believe that agriculture is an exception and needs to be supported and protected from international competition (i.e., protectionism). The opponents of trade liberalization, who argue for protectionism, state that price volatility, unstable farmers' income, and unpredictability of weather and environmental conditions are some of the reasons for state protection and assistance.

Furthermore, protecting the agricultural sector from international competition will allow it to develop its strengths and promote exports (Gardner, 1992; Moon et al., 2016).

As it stands, there is no consensus among scholars on the impact of trade liberalization on employment. While some studies reveal the positive effects of trade liberalization on employment, some claim that the relationship is negative, while others indicate that trade openness does not affect employment (Dutt et al., 2009, Hasan et al., 2012). Considering this argument between proponents and opponents of trade liberalization, the previous employment impact, and the potential of the Nigerian agricultural sector, vis a vis the argument for protectionism in the sector, it is worth evaluating the effects of liberalization on employment in Nigeria.

## **1.2 Economic problem**

Nigeria has a labor force of over 80 million people, of which over 24 million are between 25 to 34 years old (Kazeem, 2020). Currently, 26.6 million of the 80 million people who could be working in Nigeria are not. An economic problem owned by many of these 26.6 million people is their willingness but the inability to obtain gainful employment. This is an economic problem because satisfying their wants depends on their income which is a function of how much contribution they make in production, output, and revenue generation. Therefore, without gainful employment, less is produced, fewer goods and services are traded, and less is consumed. In addition, the smaller output does not make people richer; it makes them poorer.

Employment is a two-party affair; it only occurs if both the buyer and seller of labor deem it mutually and bilaterally beneficial. Labor is supplied because individuals anticipate and prioritize their rewards (wages) which also allows them to meet their own needs. On the other hand, the demand for labor is determined by its marginal physical product. The quantity demanded is a function of output level, revenue, quality, quantity and prices of complementary



capital, and labor inputs. When wage rates are above the point stipulated by the marginal physical product, excess workers are laid off, and vice versa. That is, when rates are below this point, employers bid against each other for more workers up to the point where there is no further marginal profit in hiring more or bidding up wages more.

The scale of unrealized productive (and hence, consumptive) opportunities created by unemployment in Nigeria is staggering. Despite the large number of these people who are searching and willing but unable to obtain employment, revenues earned by Nigerians' production of goods and services (more than US\$500 billion) still exceed that of producers in every other country in Africa (Kamer, 2022). The manufacturing sector is the largest on the continent and the largest source of consumer supply in other countries in West Africa. Oil reserves in Nigeria are the tenth largest in the world, totaling at least 38 billion barrels. Daily production of about two million barrels satisfies roughly 2.5% of global demand (Iledare & Suberu, 2010). According to Akuru and Okoro (2011), proven oil reserves can be increased to 40 billion barrels and daily output doubled.

The increase in wealth that would arise from an expansion in private-sector employment in Nigeria is considerable and easily perceptible but beyond precise quantification. The need to broaden and bolster wealth creation in the country is acutely critical. More than 40 percent of Nigeria's 170 million people have yet to escape poverty.

### **1.3 Economic research problem**

It is a curious puzzle how the 26.6 million people in Nigeria manage to survive without the income stream from a job. What impact does increased demand through trade with other countries have on the situation? Is it positive, negative, or no effect? Also, are there differences

between labor markets in agriculture and agri-food from other markets for labor? Providing answers to these honest questions is the rationale behind this study.

It is appalling how the level of unemployment in Nigeria is so large and rising despite the considerable productive potential, particularly in agriculture and agri-food. Vast agricultural resources include a supportive climate, fertile soil, adequate annual rainfall, minerals, and an enormous, willing, and educated labor force. There are 34 million hectares of arable land in Nigeria, of which 6.5 million hectares are used for cropping, with the remainder serving as meadows and pastures (Sasu, 2022). Government initiatives focussed on boosting agriculture production have included programs such as the Agriculture Promotion Policy (APP), Anchor Borrowers Program (ABP), National Agricultural Technology and Innovation Plan (NATIP), etc. After the implementation of these programs, the contribution of agriculture to the gross domestic product in Nigeria increased from 24.6 percent in the second quarter of 2020 to 29.9 percent in the third quarter of 2021 (Statista, 2022). Despite this, the unemployment statistics in the country did not improve; instead, it increased to an all-time high of over 33 percent (NBS, 2021). A better understanding of the connection between labor markets and production, trade, and consumption is central to resolving the economic research problem of this study. There is an urgent need for information generated through economic research to help those struggling with unemployment issues.

According to the National Bureau of Statistics (NBS), youth unemployment (15-24 years) was 53.4 percent in the fourth quarter of 2020. Also, unemployment in the country plagues the educated and uneducated alike; however, it is worse even among skilled and learned manpower. By the fourth quarter of 2020, unemployment among illiterates in Nigeria was 28.4 percent

whereas 37.1 percent among those with a secondary school leaving certificate, and 40.1 percent among first-degree holders.

Unemployment is a major cause of poverty (McClelland & Macdonald, 1998; Makaringe & Khobai, 2018). According to White (1991), unemployed people reported that being unemployed is the worst thing that can happen to anyone. In addition, Macklin (1992) and Smith (1987) have shown a positive relationship between joblessness and poor health. Beyond the socio-economic consequences, it causes and promotes psychological stress among other effects (McClelland & Macdonald, 1998) including but not limited to increased crime rates, protests, and premature death (Makaringe & Khobai, 2018).

In theory, lower trade barriers improve resource allocation, expand employment opportunities, and increase wealth within and across geo-political boundaries. As free trade expands the number of potential buyers, it enhances the division of labor based on its comparative advantage. As the cost of production falls with total output increasing, the marginal revenue product of labor rises and leads to the bidding up of wages (Babatunde et al, 2012). Nonetheless, this has not been so in the past few years, despite Nigeria being a member of the World Trade Organization and having bilateral investment agreements with 31 countries.

#### **1.4 Research purpose and objectives**

Free trade is expected to create more jobs by reducing relative prices, expanding consumer choices, improving product quality, and improving resource usage. Although trade liberalization is presumed to improve overall and sectoral employment, empirical studies on some countries do not support this claim (Dutt et al., 2009, Hasan et al., 2012). Consequent to the increasing unemployment statistics despite the country's potential and trade liberalization in Nigeria in

recent years, the purpose of this study is to provide empirical evidence for the effects of trade liberalization on the agricultural sector and aggregate employment in Nigeria. Although trade theories suggest a positive outcome between trade and employment, the results may be counterintuitive.

To realize this purpose, the study has four objectives:

1. to identify and discuss employment and trade trends in Nigeria.
2. to investigate the impact of trade liberalization on employment in the agricultural sector.
3. to investigate the impact of trade liberalization on overall employment in Nigeria.
4. to investigate the effect of agriculture's share of the GDP on aggregate employment in Nigeria.

Based on the anticipated research findings, recommendations that may improve the employment gain of trade liberalization in the agricultural sector and Nigeria's overall economy will be suggested. This may help decision-makers formulate better and informed policies that will consequently improve production and expand consumptive opportunities, thus enhancing employment in Nigeria.

### **1.5 Research Hypotheses**

I disaggregate trade liberalization measures into trade volume and trade policy measures. The trade volume measure includes the trade openness index, foreign direct investments, and agricultural share of the gross domestic product. The growth outcome of trade in a country is greatly affected by macroeconomic stability which mirrors the effectiveness of trade policies. Therefore, the study employed inflation as a trade policy measure.

The focus of the study is involuntary unemployment in Nigeria. That is, people who are able and willing not being able to get jobs. According to trade theories and arguments from international trade organizations, trade liberalization is expected to improve employment and engender economic growth. Thus, this study seeks to empirically test the following hypotheses from the research objectives stated above.

Hypothesis 1: Trade Openness Index has a positive effect on aggregate employment in Nigeria.

Hypothesis 2: Trade Openness Index has a positive effect on agricultural sector employment in Nigeria.

Hypothesis 3: Foreign Direct Investments (FDI) have positive effects on aggregate employment in Nigeria.

Hypothesis 4: Foreign Direct Investments (FDI) have positive effects on agricultural sector employment in Nigeria.

Hypothesis 5: Agriculture's share of the gross Domestic Product (GDP) has a positive effect on aggregate employment in Nigeria.

## **1.6 Scope of the Study**

The study considers employment and trade data from 1991 till 2020. This 30-year period is defined by availability of consistent data because earlier years were marked with a lot of missing data across the variables of interest. Also, the period coincides majorly with the post-structural adjustment program (SAP) era. Thus, a major part of the study focuses on Nigeria's trade and employment performance at the end of the SAP.

## **1.7 Justification of the Study**

Generally, there is no consensus among the empirical studies on the employment effect of trade liberalization in Nigeria. To the best of my knowledge, although the agricultural sector is acknowledged as an employment driver in Nigeria, the effect of trade liberalization on employment in the sector has not been sufficiently investigated. Furthermore, despite the plethora of studies on trade, I could not find any study that has investigated the impact of the share of agricultural output in GDP on aggregate employment in Nigeria.

Again, this study may be a worthwhile task because although international institutions like World Bank, Africa Development Bank, and World Trade Organization argue for trade openness, there is a parallel argument in some studies for protectionism, especially in the agricultural sector.

## **1.8 Organization of the Study**

The rest of this study is organized as follows. The second section discusses trade liberalization policies and their possible association with overall employment and employment in the agriculture sector. Section 3 presents a review of relevant literature on the nexus between trade liberalization and employment, while in section 4, the data, their sources, and econometric models are explained. It also discusses the variables that are used to empirically investigate the effects of trade liberalization on aggregate and agricultural sector employment in Nigeria. The results are presented and discussed in the fifth section. Also, possible explanations and factors that may be responsible for the findings were discussed here. Finally, the study is concluded in the sixth section where it offers some policy recommendations.

## **CHAPTER 2: AN OVERVIEW OF THE TRENDS IN EMPLOYMENT AND TRADE LIBERALIZATION IN NIGERIA**

### **2.1 Trade liberalization history and its impact on Nigeria**

The purpose of this chapter is to discuss the emergence and adoption of trade liberalization as a means to addressing unemployment in Nigeria. Also in this section, trade and employment data are graphically represented to better illustrate the economic performance of Nigeria, especially after the abolition of the structural adjustment program (SAP) in the country.

The desire to trade is innate to man and it is one of its oldest instincts. From the ancient and medieval periods to date, international trade has been a requisite engine for growth and economic progress (Ekesiobi et al., 2011). Smith (1776) noted, “The propensity to truck, barter, and exchange one thing for another is common to all men and to be found in no other race of animals”.

The focus of traditional trade agreements was on reducing tariffs and other non-tariff barriers to trade. For instance, the General Agreement on Trade and Tariff (GATT) round of multilateral trade negotiations before the establishment of the World Trade Organization (WTO) in 1995 witnessed a period of high tariffs, especially after World War II. These high tariffs are forms of trade restrictions and the negotiations were about removing or reducing them to promote trade between countries. The success of traditional trade agreements in lowering tariffs is proof that such agreements seek to mitigate protectionist interests and increase trade (Rodrik, 2018). As of 1990, a total of 25 regional trade agreements have been reported to GATT since its inception in 1948 (WTO; Urata & Okabe, 2010). By January 1995, when the WTO was created, almost all members of GATT were signatories to at least one trade agreement or the other (Raquel &

Portes, 1998). The number increased to 91 by 2000 and climbed to 194 reported regional trade agreements by March 1, 2007 (Urata and Okabe, 2010). There are about 306 registered regional trade agreements with the WTO that are in force as of 20 September 2020 (WTO, 2020). Also, many FTAs go beyond the removal of tariffs to include other elements such as liberalization of foreign direct investments (FDI) policies, facilitation of trade and FDI, and economic cooperation (Urata and Okabe, 2010).

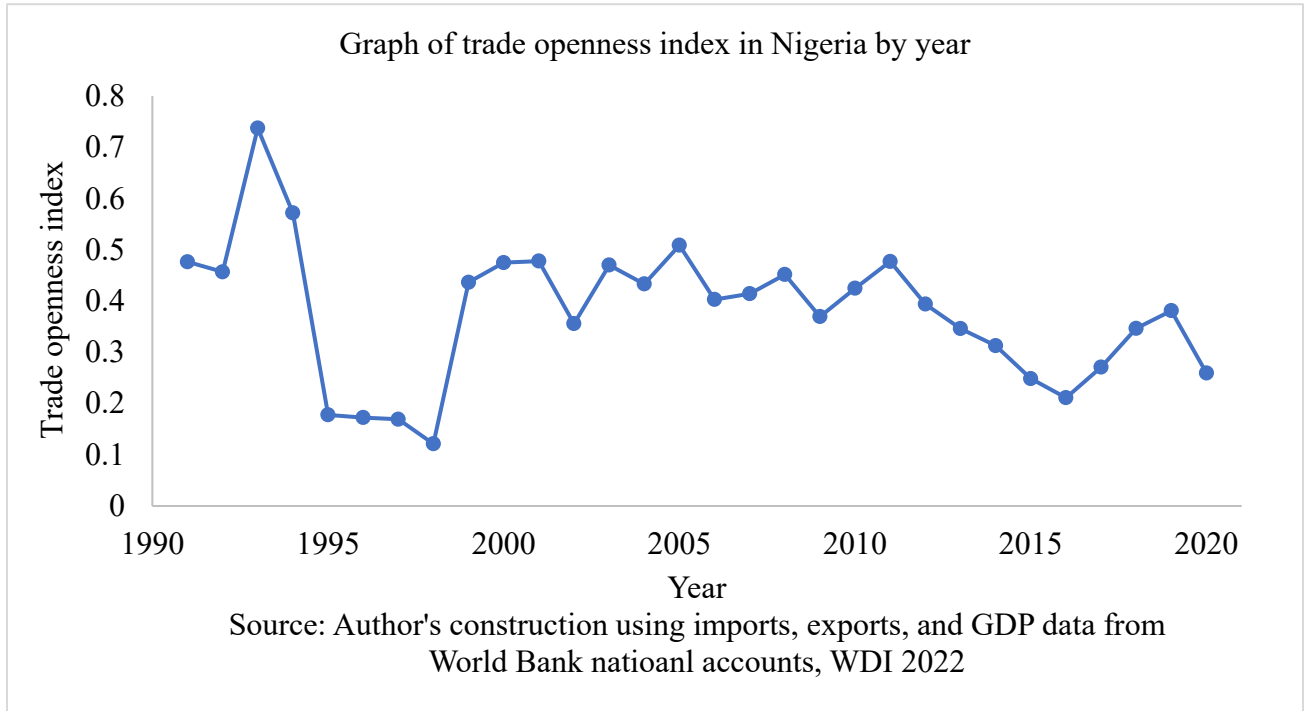
Nigeria as the largest economy in terms of GDP in Africa is a member and signatory to several multilateral and regional trade agreements through the West African Monetary Zone and Economic Community of West African States (ECOWAS) just to mention a few. The effects of such agreements on trade are to remove barriers, reduce tariffs, and ensure outward-oriented policies (Nabine, 2009). Nigeria, as a major political player, accounts for more than 50 percent of the entire ECOWAS region. Nigeria is also a key contributor to the enhancement of regional peace and democracy within the ECOWAS sub-region. Despite that the country is a major force, controlling about 60 percent of the bloc's trade; there are still limitations in trade in terms of products and destination markets. 25 percent of its overall trade is within European Union (EU) which absorbs about 22 percent of Nigeria's export making it second only to the United States of America (U.S.A) according to the National Bureau of Statistics (NBS, 2006). Statistics from the European Commission reveal that petroleum products account for about 94 percent of Nigeria's trade while foodstuffs and animal products made up about 3 percent in 2006 (Nwali and Arene, 2015). The 2000 Cotonou agreement demands that countries negotiate new trade agreements between the European Union and the 79 African, Caribbean, and Pacific (ACP) countries. These new set of trade agreements are called Economic partnership agreements (EPAs) between the EU and the ACP regional groupings. The negotiations which started in 2002 were planned to be



concluded in 2007. However, a larger percentage of the ACP economies did not conclude negotiations by 2007 as planned (Andriamananjara et al, 2009). The aim of the Economic Partnership Agreements (EPAs) between West Africa and the European Union (EU) is to facilitate trade. It is expected that through these relations, trade liberalization will deepen development, engender sustainable growth, and poverty reduction will take place in the ECOWAS sub-region (Onogwu and Arene, 2013). The EPAs are instituted to help West African countries integrate into the world economy and benefit from the privileges available within and outside their sub-region through globalization. According to ECOWAS Statistical Bulletin (2008), the agreements also seek to widen the trade cooperation in areas like services, acting as a catalyst of change to trigger reform and bolster rule of law in the economic field, and as such attracting foreign direct investment (FDI) that will help stimulate growth (Nwali and Arene, 2015).

Nigeria has enjoyed privileged access to the EU market for about three decades. However, the intended benefits seem unrealized in terms of economic development. That is, preferential treatment has not yielded much in boosting local economies and engendering growth in ECOWAS and ACP countries (Panagariya, 2002). Apart from this, during the Structural Adjustment Program (SAP) era- (1986-1993), most ECOWAS countries channeled policies to change and re-align aggregate domestic expenditure, specialization, and production trends to ameliorate over-dependence on imports; boost non-oil export base, and ensure steady economic growth (Babatunde, 2006). All these efforts notwithstanding, the implications of Economic Partnership Agreements (EPAs) on Nigeria's trade, in terms of trade volume, tariff income, and welfare remained unknown. Thus, the Nigerian policymakers are not adequately equipped in their negotiation bid to arrive at EPAs that will allow trade and growth interest of the sub-region

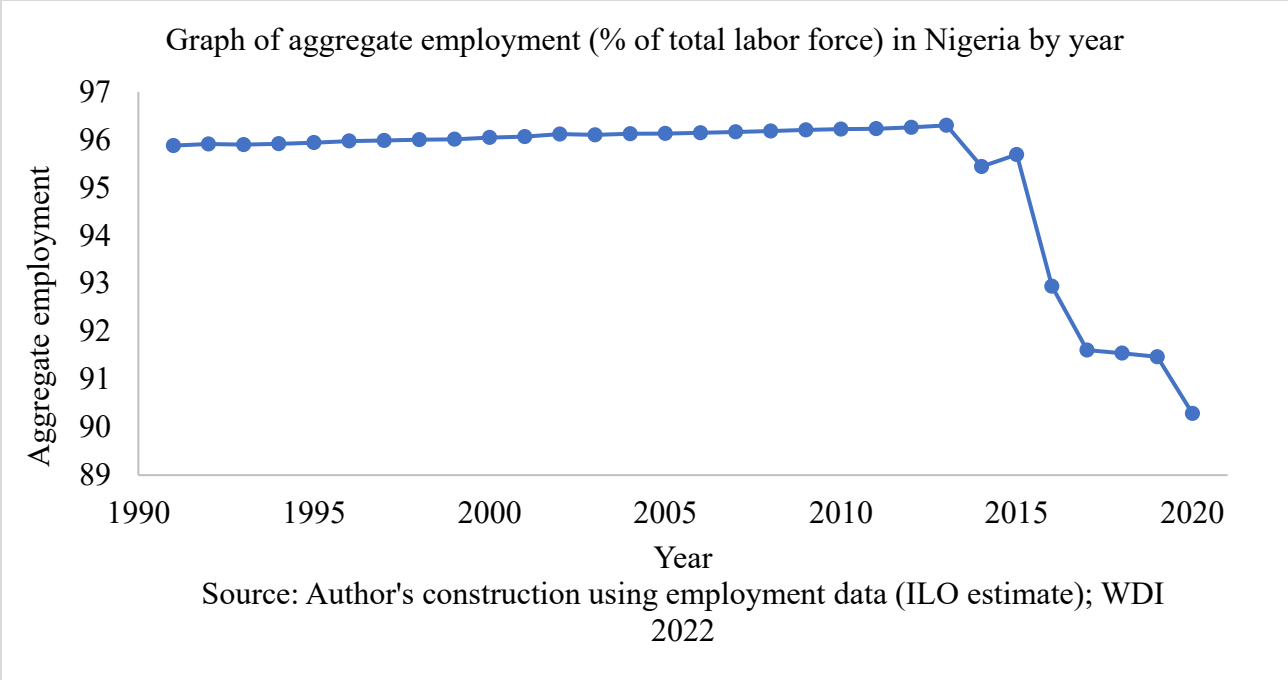
(Nwali and Arene, 2015). The trade openness index (the ratio of trade to GDP) trend also appears erratic and relatively low as can be seen in figure 1.



**Figure 1: Graph of trade openness index in Nigeria between 1991 and 2020**

## 2.2 Employment and trade trends in Nigeria

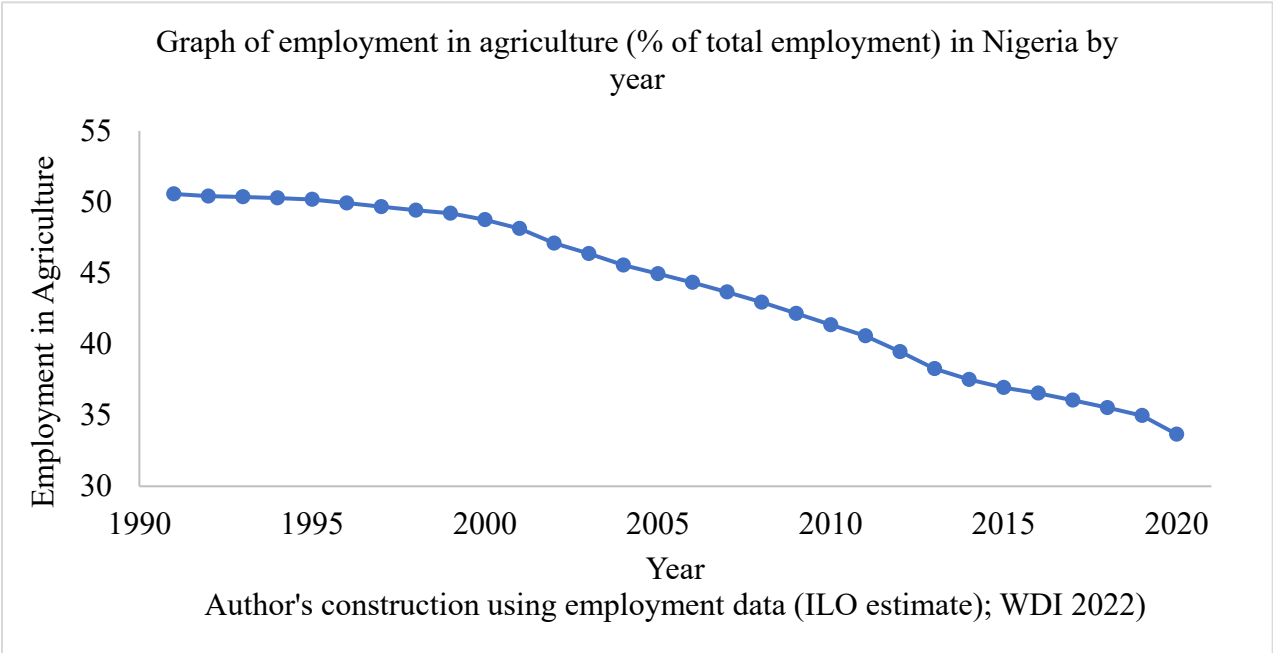
The unemployment problem in Nigeria dates to the 1980s (Babatunde et al., 2012). The current state of unemployment in the country shows that a solution is not yet at hand. As can be seen from Figure 2, the consistent unemployment increase in the last couple of years has caused the aggregate employment in the country to nosedive. According to the statistics from the NBS, unemployment in Nigeria in the past two years have been over 30 percent. Currently, it is put at 33.3 percent. However, this annual data from NBS was not available for the number of years under study. Thus, the study employed the data from World Bank which seem to be an underestimation of the reality in the country.



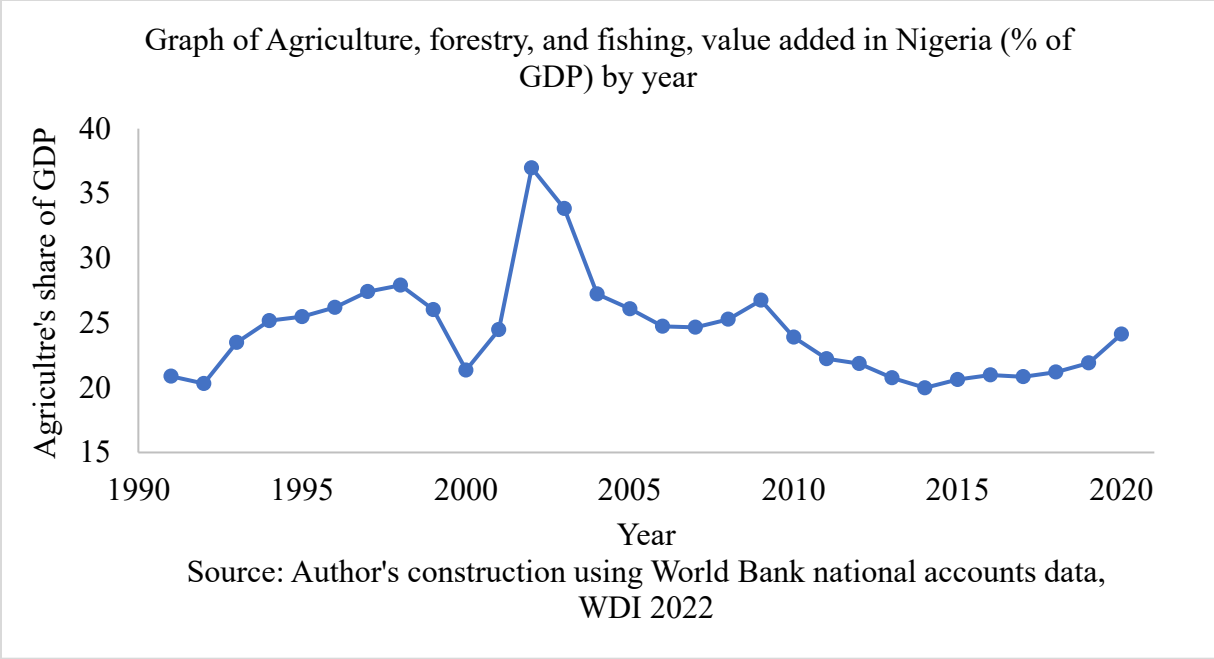
**Figure 2: Graph of aggregate employment in Nigeria between 1991 and 2020**

International trade has been identified as a panacea for unemployment in developing countries like Nigeria (Babatunde et al, 2012). The World Bank and International Monetary Fund (IMF) in a bid to improve economic growth and employment in developing countries have used trade liberalization conditions for obtaining loans and this has compelled many of these countries to embrace free trade (Yanikkaya, 2013). Economic growth in Nigeria has been strongly related to international trade. This includes the export boom in the agricultural sector and the oil boom in the 1970s (Babatunde et al., 2012). However, it is argued that the country fared better with the agricultural export-led growth. Critics have argued that the oil sector does not productively engage the abundant labor in the country as it is mainly capital intensive. This is consistent with the claims of Winter et al, (2004) that international trade through expanded market frontiers increases aggregate demand for labor-intensive goods and increases the wages and demand for abundant labor which is a comparative advantage in most developing countries. Currently, the

oil export in Nigeria accounts for about 90 percent of the total exports in the country (Statista, 2022). Non-oil export and agricultural exports are less than 10 percent of Nigeria’s export. This neglect of the agricultural sector has been accompanied by a relatively lower contribution of agriculture to the country’s GDP and agricultural sector employment as can be seen in Figures 3 and 4. The downward sloping trend of employment in the agricultural sector is evident in Figure 3. Employment in the agricultural sector as a percentage of the total employment which was 50.57 percent in 1991 was 33.66 percent in 2020. Yet, this sector at its lowest point still employs labor more than the oil sector which according to a Nigeria Extractive Industries Transparency Initiative (NEITI) report in 2018 employs just 0.03 percent of Nigeria’s labor force.



**Figure 3: Graph of agricultural sector employment in Nigeria between 1991 and 2020**



**Figure 4: Graph of agriculture’s share of the GDP in Nigeria between 1991 and 2020**

For instance, the agricultural share of GDP which was about 37 percent in 2002 was about approximately 24 percent by 2020. This shows that the Structural Adjustment Programme (SAP) which was adopted in 1986, to date has failed to deliver on its major mandate of diversifying the Nigerian economy from crude oil (Babatunde et al, 2012). According to data from Statista (2012), agricultural products account for about 2 percent of Nigeria’s total export, however, it contributes about 24 percent of total GDP in the country compared to the oil sector which contributes about 7.5 percent despite accounting for about 90 percent of the country’s exports.

Having discussed the historical development of trade liberalization in Nigeria and graphically shown the performance of the major variables of interest in this study, it is important to situate the study in the body of literature with a view to identifying gaps and appropriate methodological approach to addressing the research problem.

## CHAPTER 3: LITERATURE REVIEW

This section reviews theoretical papers, applicable trade theories, and empirical studies with a view to providing the theoretical inclination of this study, establish gap, and identify weaknesses in the extant literatures thus justifying the need for this study. A review of the relevant empirical studies also provides guidance on the choice of data, variables, and methodology in addressing the objectives of this study.

### 3.1 Theoretical review

Although the nexus between trade and employment has been well discussed in the literature, the employment impact of trade has been a source of unending concern to policymakers (Edwards, 1998). Nevertheless, the employment gain from trade has been promoted through several theoretical models. David Ricardo developed the theory of comparative advantage in 1817 to explain why nations are involved in trade. According to the Ricardian comparative advantage theory, using a two-sector and single factor (labor) small country model, trade openness reduces unemployment. Trade liberalization will increase the relative domestic price of the export commodity due to an expanded market (demand), which leads to higher demand of labour. This was proven true by the studies of Felbermayr et al. (2011) in their heterogeneous firm productivity model. However, the study of Helpman and Itskhoki (2010) finds a contrary result in the presence of different goods, a heterogeneous sector with labor-market friction, and a homogenous sector without labor-market frictions. They discovered that trade increases unemployment in a country with a more flexible labor market.

Another prominent theory is Okun's law (1962). Arthur Melvin Okun postulated that trade through economic growth in a country would improve employment in that country. Okun stated that when

there is a 2 percent increase in output (gross domestic product), such output growth will be accompanied by a 1 percent decline in cyclical unemployment, 1 percent increase in labor productivity, 0.5 percent increase in labor force involvement, and the number of hours worked per unit of labor (Okun, 1962). Although Okun mathematically established the regression link between unemployment and output, his conclusions have been criticized for being deficient in economic reasoning and ambitious (Harris & Silverstone, 2001). Nigeria's unemployment and growth statistics have also defied this because the employment rate did not improve despite GDP growth in the last decade. For example, Although Nigeria recorded an average of 6.4 percent economic growth between 2000 and 2011, unemployment increased from 1.8 percent to 23.9 percent between 1995 and 2011 according to the Central Bank of Nigeria (CBN) Annual Report.

Trade-employment nexus has also been explained using the specific factor model. Yanikkaya (2013) opined that this model better explains the trade-employment nexus in developing countries. According to Edwards (1998), in the short-run, under the assumption of capital specificity, labor mobility, and inelastic aggregate factor supply, there will be increased employment in the export-promoting sector and decreased employment in the import-competing sector. To explain the long-run situation, a four-sector model was employed, with capital (K) and labor (L) in each sector, and capital can also move between sectors. The model posits that employment will increase in the export-promoting sector, whereas there will be a decline in employment in the import-competing sector. Thus, this model states that trade is expected to improve the overall employment in developing countries because the labor intensity of the export sector is assumably higher in these countries. If this holds true in Nigeria, then the study will not reject the first and second hypotheses that trade openness has a positive effect on aggregate and agricultural employment in Nigeria, respectively. However, empirical study by Haouas et al. (2005) on the impact of trade liberalization

on employment in Tunisia does not confirm this theory. The possible failure of the theory is because it is predicated on the assumption of a fixed supply of labor which is not always true in practice.

There is no consensus on the impact of trade on employment. The critics of trade liberalization contend that some policies may restrict international trade and yet improve citizens' welfare. Therefore, it is overarching to judge a policy as antihuman because it negatively correlates with economic growth metrics. (Rodriguez & Rodrik, 2000). Intuitively, the increased output may not necessarily guarantee employment or improve per capita income. This could be because the growth is not intensively engaging the abundant labor. Also, the growth effects of trade can be annulled by faster population growth. Thus, there is a need for studies that consider these welfare implications of economic growth. Besides, some scholars posit that trade may be detrimental to the employment prospect of unskilled workers because it engenders technological growth that makes these unskilled workers irrelevant and jobless (Meroyi, 2016). The theoretical model of Bhagwati (1958) stated that openness is detrimental to developing or agrarian economies. He noted that export-led growth could worsen the terms of trade so much that the gains from liberalized trade become inconsequential. Thus, the study may reject the first and second hypotheses.

The gains from trade are affected by different factors such as quality institutions (Dollar & Kraay, 2004) as well as a country's geographical attributes like population, country size, and per capita income (Frankel & Romer, 1999). The geographical concentration of economic activities is vital in modeling trade. Krugman (1998) argues that the effects of these geographical factors have not been well catered for in most of the extant empirical studies. However, it is assumed that they are indirectly proxied by trade volume measures (such as Foreign Direct Investment), although the partial effect of each remains unknown (Dollar & Kraay, 2004).



Hence, FDI is a good proxy for a country's absorptive capacity and institutional quality (Azman-Saini & Law, 2010; Azman-Saini et al., 2010). According to the endogenous growth models (the FDI spillovers theory), the welfare of people in developing countries can be improved because of their relative backwardness through the "contagion" effect (Baltabaev, 2014). If the FDI spillover theory holds in Nigeria as a developing country, there should be a positive relationship between FDI and employment. This means that the study will not reject the third and fourth hypotheses that FDI has positive effects on aggregate and agricultural sector employment in Nigeria, respectively.

However, the new growth model suggests that FDI may not engender growth due to the crowding-out effect of the domestic businesses; instead, it transfers capital stock to strangers (de Mello Jr, 1997; Agosin & Machado, 2005). This happens when the foreign businesses compete for skilled labor and other scarce resources, compete in projects that the local businesses could have done, and finance their investments through loans from the host country. These increase interest rates in the host country and repatriate profits to foreigners. Herzer (2012) alluded to this and argued that FDI does not improve welfare in developing countries. Thus, theoretical studies are indecisive about FDI-growth impacts. The differences in results in cross-country analyses are contingent upon country-specific factors. A positive outcome depends on having quality institutions in the host country in terms of reduced government intervention, reduced volatility, less dependence on the primary sector, and improved economic freedom. Hence, because Nigeria's economy is arguably defiant to these conditions, one may expect that FDI may not improve aggregate employment in Nigeria. Also, according to Herzer (2012), the primary sector (agricultural sector inclusive), unlike the manufacturing sector, has fewer spillover linkages to the host economy. Thus, it means that FDI may also not improve employment in the Nigerian agricultural sector. In

this case, the study will reject the third and fourth hypotheses that FDI has positive effects on aggregate and agricultural sector employment in Nigeria, respectively.

Considering the disagreement on the impact of trade liberalization on employment, this study investigates the employment impact of free trade in Nigeria to find out if Heckscher-Ohlin's theory holds true in Nigeria. This theory asserts that a country should export goods that use the abundant factor and import those that intensively utilize the relatively scarce factor. He argued that this would make trade liberalization improve aggregate employment and wages of the abundant unskilled labor in developing countries than their developed counterparts (Wood, 1994, 1997; Winters et al., 2004; Dutt et al., 2009; Babatunde et al., 2012). Thus, if Heckscher-Ohlin's theory is applicable in Nigeria, promoting agricultural exports can reduce unemployment and poverty because it engages the abundant labor in the country. This position has been held in the literature that the Nigerian agricultural sector is a major employment driver in the economy. Nonetheless, to my knowledge, few studies have empirically studied the effects of agricultural production (agriculture's share of GDP) on aggregate employment in Nigeria. Hence, the fifth hypothesis that agriculture's share of GDP will have positive effect on aggregate employment in Nigeria.

Previous studies have established that overall growth in the economy does not guarantee growth in the individual sectors. They argued that the supposed increase in the output of one sector could harm the other sector(s) (Matsuyama, 1992; Said & Elshennawy, 2010). This phenomenon where improvement in a sector causes harm to the other sector is called Dutch Disease. Hence, sectoral impact analysis has been argued for in the extant literature on trade impact, which is why the 'Dutch disease' concept has become quite popular in trade discussion. Also, the aggregation effect has been criticized by Wang (2009) for undermining sectoral contributions. It was noted that trade

liberalization measures like Foreign Direct Investment (FDI) are sometimes sector-specific. That is, Multinational Corporations (MNCs) invest in different sectors. Thus, studies that investigate such investment impact on aggregate employment or overall economic growth do not only blur out their effects but also publish confusing results (Wang, 2009). Furthermore, Wilson (1960) argued that policies that affect the output of the labor-intensive sector exert the most employment impact. Since the agricultural sector in Nigeria is still labor-intensive, the need for more empirical investigations of the agricultural sector is intuitive. However, it has not received the attention it deserves in Nigeria.

### **3.2 Empirical review**

Insights from general empirical studies suggest that the impacts of trade liberalization on the economy are not definitive but contingent on several other factors (Kareem, 2010; Kalu and Agodi, 2015; Yakubu and Akanegbu, 2015). One of such factors is the human capital level. For instance, while Şener (2001) demonstrates that the employment of unskilled labor is worsened by trade liberalization, Loganathan et al. (2011), used Malaysian data from 1980-2010, and found that trade liberalization improves sectoral productivity, which consequently improves employment of both skilled and unskilled labor in the country.

Another important factor identified in empirical studies is the time factor. The effect of trade liberalization differs between long-run and short-run periods. Felbermayr et al. (2011), who employed panel data for 20 Organization for Economic Co-operation and Development (OECD) countries, also found that structural unemployment is reduced by trade openness in the long run. However, Haouas et al. (2005) used data from 1971 to 1996 to investigate the short-term and long-term effects of trade liberalization on employment and wage in Tunisia. They established that trade

liberalization benefits the labor market both in the short and long run. However, the shreds of evidence are relatively few. Thus, it may be too early to conclude that the long-term effect of trade on employment will always be positive.

In addition, the impact of trade on employment is contingent on the condition of the labor market. According to Kim (2011), the effect of trade liberalization on unemployment is conditional on how rigid or flexible the labor market institutions are. Using panel data from 1961-2008 from 20 OECD countries, they concluded that trade worsens employment in a very rigid labor market situation and improves where the labor institutions are more flexible. On the other hand, the author states that there exists no significant relationship between trade and unemployment in an averagely rigid labor market. However, the classification into 'very rigid' and 'averagely rigid' may be difficult to delineate and thus not objective enough. Furthermore, Hasan et al. (2012) employed data from India National Sample Survey Organization (NSSO) to evaluate the impact of trade on unemployment at both industry and state levels. The authors asserted that unemployment in the urban areas reduces with increased trade liberalization, especially in states and industries with labor market flexibility.

Also, the effect of trade liberalization on employment depends on the developmental stage of the countries involved. Cho et al. (2008) argued that Porter's diamond model does not effectively cater to developing economies as it appears more relevant to developed countries. According to Kim (2011), aggregate unemployment is worsened by imports from developed economies. In contrast, no significant relationship exists between other trade variables like total trade, total imports, imports from emerging economies, and aggregate unemployment. Yanikkaya (2013) also investigated the effect of trade liberalization on employment in developing and developed nations

using data from 1980 to 1999 for 100 developed and developing countries. The study alleged that most developing countries have not benefitted from trade in terms of job creation. Therefore, the author concluded that for developing countries to benefit from trade liberalization, they must bolster their institutions, provide all forms of capital, and make the right policies.

There is a consensus in the literature that the economic success of a nation does not depend on trade liberalization or protectionism alone but also on some other macroeconomic policies by the government that create the necessary environment where the dividends of open trade can be reaped (Rodrick 1998; Winters, 2004). These, according to Newfarmer & Sztajerowska (2012) are called companion or supportive policies. This has been alluded to by many studies on the Nigerian economy that found the positive impact of trade on employment to be absent. For instance, Kareem (2010) analyzed data between 1970 and 2004 to measure trade impacts on employment in Nigeria. It was found that trade liberalization does not improve employment in the country. Also, Balogun and Dauda (2012) employed data between 1985-2010 to study the relationship between trade liberalization, job creation, and poverty reduction in Nigeria. They found that although trade openness fosters an increase in output and economic growth, these do not improve the unemployment and poverty situation in the country. Akims (2014) established that the total removal of every form of trade restriction within the Economic Communities of West African States (ECOWAS) region would improve wages and employment in Nigeria. According to Meroyi (2016), an inconducive economy caused by ineffective policies is responsible for Nigeria's trade liberalization failure. He attributed the failure to the fact that Nigeria, a labor-abundant country, has embraced and maintained a capital-intensive posture that neglects the primary sector. A highly skill-intensive economic stance disfavors the uneducated, unskilled, and less educated surplus labor in the country because it favors the use of machines over human labor. Another policy issue

identified by the author is macroeconomic stability in Nigeria. Raifu (2017) and Onifade et al. (2020) found that inflation improves employment according to the Phillip's curve theory. Thus, Onifade et al. (2020) contend that caution must be exercised in combating inflation within the economy so that trade is not promoted at the expense of improved employment. The study analyzed data from 1981-2017 and however concluded that trade openness has been detrimental to unemployment in Nigeria. The authors argue that while the importance of trade liberalization cannot be overemphasized, the government must exercise discretion to ensure a conducive policy framework where the dividends of trade liberalization can be realized.

Despite these purported policy failures, Nigeria has experienced economic growth in the past years and is regarded as the "giant of Africa" with the largest economy on the continent. However, this economic growth (mostly proxied by GDP) has been criticized for not being inclusive (Balogun and Dauda, 2012; Oloni, 2013). This notwithstanding, there have been some positive results from empirical analyses. Nwaka et al. (2015) analyzed time-series data from 1970-2010, and they found that real output reduces unemployment in Nigeria. Similarly, Oniore et al. (2015), using data from 1981-2014, established that the GDP growth rate reduces unemployment in Nigeria.

Consequent to my empirical review, the central argument of protectionists, which is poor methodology and variable choices, was identified in some studies in Nigeria. It is plausible that this methodological weakness is responsible for the contrasting trade-employment results. Nwaka et al. (2015) and Oniore et al. (2015), while studying the trade-employment nexus, used trade openness and degree of openness (DOP) respectively as their trade liberalization metrics. Although their results show that both worsen employment in Nigeria, it is unclear if trade openness and degree of openness mean the same thing because the authors did not indicate the measurement

criteria of these similar variables. On the other hand, Akinyemi et al. (2014) studied the relationship between trade liberalization and employment in Nigeria with data set between 2003 and 2007. They claimed that trade openness significantly benefits employment in Nigeria's agricultural, manufacturing, transport, quarrying, and mining sector of Nigeria. The study also stated that other variables like foreign direct investment and trade tariffs significantly affect Nigeria's employment figure. However, these claims can be questioned based on the paucity of data employed.

Thus, it can also be concluded that findings on the relationship between trade liberalization and employment are still inconclusive due to several factors like differences in variables employed, whether the country being understudied is a developed or developing country, research methods, and scope of the study, among others. These perceived weaknesses itemized above and the lack of consensus on the impact of trade on employment in Nigeria justify the need for more empirical works.

### **3.3 Contribution to Literature**

The Nigeria agricultural sector has been identified as an inclusive growth sector with the potential to combat the unemployment problem being faced by the country (Kanu et al., 2014; Oloni et al., 2017). Also, according to the classical trade theories, trade liberalization is beneficial to countries (Van Berkum & Van Meijl, 1998). However, while several studies like Raifu (2017), Onifade et al. (2020) and others have discussed the impact of trade liberalization on the total employment level in Nigeria, to the best of our knowledge, none considered the impact of trade on the agricultural sector employment despite its potential to improve employment in the country. Thus, the study's contribution to the literature will be primarily to estimate the effects (both magnitude

and direction) of trade liberalization on employment in the Nigerian agricultural sector. The study also assesses if trade liberalization has a similar impact on aggregate employment. Furthermore, I investigate the impact that agricultural contribution to GDP has on aggregate employment in Nigeria with a view to understanding how the sectoral output impacts the overall employment.



## CHAPTER 4: METHODOLOGY

### 4.1 Model specification

This study seeks to investigate the impact of trade liberalization on both aggregate and agricultural sector employment in Nigeria. In this chapter, the model specification, econometric approach, data, and variable operationalization with respect to the research problem are discussed.

Previous studies on the impacts of trade on employment used diverse methodological approaches based on their research objectives. For instance, Haouas et al., (2005), Kareem (2010), Loganathan (2011), Balogun and Dauda (2012), and Yanikkaya (2013) employed generalized method of moments (GMM), multiple linear regression (MLR), granger non-causality analysis, computer general equilibrium (CGE), and seemingly unrelated regression (SUR), respectively.

The general idea is that increase in trade can facilitate investments, increase output, expand the market, increase revenue, improve wages, transfer skills, lead to innovation, enhance technology, and consequently improve employment. The model employed in this study is based on the study of Dutt et al. (2009). The theoretical derivation of this model has been extensively done in section two (on theory) of Dutt et al. (2009). The authors based on Heckscher-Ohlin's theory posited (proposition 2, page 5) that a decrease in trade barriers will improve employment in the labor-abundant country and decrease employment in the capital-abundant country.

Following Dutt et al. (2009), the model is linearly specified as follows;

$$\text{Unemployment}_i = \alpha_0 + \alpha_1 \text{TR}_i + \mathbf{X}_i \boldsymbol{\beta} + \varepsilon_i \dots \dots \dots (1)$$

Where  $TR_i$  denotes the extent of trade restrictions in country  $i$ ,  $Unemployment_i$  is the measure of unemployment, and  $X_i$  is the row vector of control variables.

Substituting employment for unemployment and trade liberalization for trade restriction in equation (1), the model for this study is specified thus;

$$\mathbf{Employment}_i = \alpha_0 + \alpha_1 TL_i + X_i \beta + \varepsilon_i \dots \dots \dots (2)$$

Substituting  $E_i$  for  $Employment_i$  in equation 2, the model becomes

$$E_i = \alpha_0 + \alpha_1 TL_i + X_i \beta + \varepsilon_i \dots \dots \dots (3)$$

$$E_{it} = \alpha_0 + \alpha_1 TL_{it} + X_{it} \beta + \varepsilon_{it} \dots \dots \dots (4)$$

Where  $E_{it}$  is the employment rate,  $TL_{it}$  is the extent of trade liberalization in country  $i$ ,  $X_{it}$  is the row vector of control variables and  $\varepsilon_{it}$  denotes the error term.

The trade liberalization measure was disaggregated into the trade openness index and foreign direct investment. The trade openness index is proxied by the ratio of the sum of export and import to GDP ( $X+M/GDP$ ). Although Sahoo (2009) and Fouladi (2010) argued that agricultural protectionism measures can stimulate the sector, classical trade theories argue otherwise. Thus, Fosu (2019) argued that agricultural share of GDP may be a predictor of employment in the Sub-Saharan Africa countries. Hence, agriculture’s share of GDP is thus included in the regression model. Also, economic growth in developing economies is significantly affected by the level of macroeconomic stability (Darku & Yeboah, 2018). Therefore, the study includes inflation to capture the level of macroeconomic stability within the time under study. The trade-related variables which include trade openness, foreign direct investment, agriculture’s share of GDP and

trade policy measure (inflation) are substituted for  $TL_{it}$ . The variables are denoted by  $TO_{it}$ ,  $FDI_{it}$ ,  $AGDP_{it}$ , and  $INF_{it}$ , respectively.

Substituting these variables for  $TL_{it}$  in equation 4

$$E_{it} = \alpha_0 + \beta_1 (TO)_{it} + \beta_2 (FDI)_{it} + \beta_3 (INF)_{it} + \beta_4 (AGDP)_{it} + X_{it}\beta + \varepsilon_{it} \dots \dots \dots (5)$$

It must be recalled that the main interest of the study is to investigate the impact of trade liberalization on aggregate and agricultural sector employment. Therefore, the independent variables include the trade openness index, foreign direct investment, inflation, agriculture share of the gross domestic product, and inflation.

To estimate the  $\beta$  parameters in equation 5, the baseline model (without control variables) is specified as follows;

$$E_{it} = \alpha_0 + \beta_1 (TO)_{it} + \beta_2 (FDI)_{it} + \beta_3 (INF)_{it} + \beta_4 (AGDP)_{it} + \varepsilon_{it} \dots \dots \dots (6)$$

Education or other measures that facilitate knowledge transfer can be used as a substitute for technological progress (Grossman & Helpman 1991a, 1991b; Aghion and Howitt 1992). The study thus includes human capital index (high school enrolment) and economic freedom index represented by  $HC_{it}$  and  $EF_{it}$ , respectively. According to growth literature, labor growth can be proxied by the population growth rate (Darku and Yeboah, 2018). Lastly, Fosu (2019) asserted that increased government consumption expenditure in the Sub-Saharan African countries negatively impacts employment in the region. Summarily, the human capital index, economic freedom index, total population, and government consumption expenditure are all included as control variables.

Substituting the independent variables for  $TL_{it}$ , and the four control variables, education  $(HC)_{it}$ , total population  $(POP)_{it}$ , economic freedom index  $(EF)_{it}$ , and government consumption expenditure  $(GCE)_{it}$  for  $X_{it}\beta$  in equation 4, the trade-employment model is written as;

$$E_{it} = \alpha_0 + \beta_1 (TO)_{it} + \beta_2 (FDI)_{it} + \beta_3 (INF)_{it} + \beta_4 (AGDP)_{it} + \beta_5 (POP)_{it} + \beta_6 (HC)_{it} + \beta_7 (GCE)_{it} + \beta_8 (EF)_{it} + \varepsilon_{it} \dots \dots \dots (7)$$

To evaluate the impact of trade liberalization on employment in the agricultural sector and aggregate employment in Nigeria, we denote the first dependent variable, aggregate employment with TEMP and the second dependent variable, agricultural sector employment, as AEMP. Substituting  $TEMP_{it}$  for  $E_{it}$  in equation 7, the trade and aggregate employment model is specified below as follows.

$$TEMP_{it} = \beta_0 + \beta_1 (TO)_{it} + \beta_2 (FDI)_{it} + \beta_3 (INF)_{it} + \beta_4 (AGDP)_{it} + \beta_5 (POP)_{it} + \beta_6 (HC)_{it} + \beta_7 (GCE)_{it} + \beta_8 (EF)_{it} + \varepsilon_{it} \dots \dots \dots (8)$$

Substituting  $AEMP_{it}$  for  $E_{it}$  in equation 7, the trade and agricultural employment model is specified below as follows.

$$AEMP_{it} = \beta_0 + \beta_1 (TO)_{it} + \beta_2 (FDI)_{it} + \beta_3 (INF)_{it} + \beta_4 (AGDP)_{it} + \beta_5 (POP)_{it} + \beta_6 (HC)_{it} + \beta_7 (GCE)_{it} + \beta_8 (EF)_{it} + \varepsilon_{it} \dots \dots \dots (9)$$

Where AEMP and TEMP represent agricultural and aggregate employment rates, respectively. TO represents the ratio of imports and exports to GDP, FDI denotes foreign direct investment, INF represents inflation, AGDP represents the agricultural share of GDP, POP stands for the population growth rate, HC denotes the level of human capital development popularly measured using secondary school enrollment, GCE stands for government consumption expenditure, and EF

denotes the economic freedom index.  $\varepsilon$  represents the stochastic error term.  $\beta_0$  is the intercept, while  $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7,$  and  $\beta_8$  represent the unknown slope parameters.

## **4.2 Econometric approach**

The econometrical approach employed is the ordinary least square method, namely the Multiple Linear Regression (MLR) since our datasets are multivariate time series. MLR as an extension of the ordinary least squares (OLS) technique is modeled such that the outcome variable is a linear function of the regressors. Here, several explanatory variables are used to predict the outcome of the dependent variable. This is the advantage of this approach over the simple ordinary linear regression. The approach helps to predict and forecast future trends using the line of best fit.

The study controlled for other variables that affect employment. Several post estimation techniques were employed which include Akaike and Bayesian information criterion for determining the best model, variance inflation factor to determine the multicollinearity level, and the Durbin-Watson d-statistics, and Breusch-Godfrey LM test to detect autocorrelation. Other techniques that could have been used to address this research problem include the Vector autoregressive (VAR) model and the Vector error correction model (VECM). However, all the variables must be co-integrated to establish a long-run relationship between them; otherwise, the latter cannot be used. Autoregressive distributed lag (ARDL) was not used because the data were not all stationary as required. It can only be used for time-series data when all the data are stationary at most after the first difference. Therefore, MLR was used to run the model because the outcomes of the stationarity and cointegration tests show that the other methods above may not be suitable.

### 4.3 Data

Considering the scope and objectives of the study, secondary data from 1991 to 2020 were used. This period was defined by the availability of data for all the variables of interest. Data for years prior to 1991 were characterized by missing data for some of the variables. Also, this 30-year period coincided with Nigeria's embrace of trade liberalization and the signing of trade agreements. Since the structural adjustment programme (SAP) in Nigeria was between 1986 and 1993, the study thus focused more on the post-SAP period and how the country has fared in terms of trade openness and employment. All the data were obtained from the World development indicators of the World Bank except secondary school enrolment data and economic freedom index data which were retrieved from the National Bureau of Statistics (NBS) in Nigeria and The Heritage Foundation, respectively. The development of the economic freedom index started in 1995 by The Heritage Foundation and The Wall Street Journal, inspired by Adam Smith's work "The Wealth of Nations".

### 4.4 Definition, operationalization of variables, and expected results

**Employment-** According to the international labor organization (ILOSTAT database) and World Development Indicators (WDI), employment is defined as persons of working age who, during a short reference period, were engaged in any activity to produce goods or provide services for pay or profit, whether at work during the reference period (i.e., who worked in a job for at least one hour) or not at work due to temporary absence from a job, or to working-time arrangements. Ages 15 and older are generally considered the working-age population. The study considered the percentage of the total labor force in the agricultural sector and the overall economy as dependent variables.

**Trade Openness-** This is empirically defined as the ratio of the sum of imports and exports to gross domestic product (Yanikkaya, 2013; Kpognon et al., 2020). According to the trade theories, trade agreements, and international organizations like World Bank, it is expected that trade openness will improve employment. Hence, we anticipate that the coefficient of trade openness ( $\beta_1$ ) will show a positive relationship with employment.

**Foreign Direct Investment-** According to WDI, FDI refers to the net inflows of investment to acquire a lasting management interest in a company operating in an economy other than the investor. It is the sum of equity capital, reinvestment of earnings, additional long-term capital, and short-term capital, as shown in the balance of payments. FDI is very crucial in employment generation, especially in Nigeria and other African countries where capital is lacking or insufficient (Fosu, 2019). The relationship between employment and the coefficient of foreign direct investment ( $\beta_2$ ) is expected to be positive.

**Inflation-** According to WDI, inflation, as measured by the consumer price index, reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The effect of the coefficient of inflation ( $\beta_3$ ) cannot be determined a priori. It could be negative or positive. Moderate inflation in the economy sometimes triggers growth (Darku & Yeboah, 2018). So, intuitively, moderate inflation may improve employment. Otherwise, high inflation is detrimental and expected to correlate with employment negatively.

**Agriculture Share of Gross Domestic Product-** This refers to the percentage of the total gross domestic product that agriculture contributes. According to WDI, it includes forestry, hunting, fishing, and cultivation of crops and livestock production. Value added is the net output of a

sector after adding up all outputs and subtracting intermediate inputs. It is calculated without deductions for depreciation of fabricated assets or depletion and degradation of natural resources. I expect that the relationship between the coefficient of agriculture share of GDP ( $\beta_4$ ) will show a positive relationship with employment.

**Population growth-** This refers to the increase in the number of people living in a place per time. According to WDI, the annual population growth rate for year  $t$  is the exponential rate of growth of midyear population from year  $t-1$  to  $t$ , expressed as a percentage. The population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship. The relationship between the coefficient of population growth and employment also cannot be determined a priori.  $\beta_5$  will be positive if population growth drives production and, consequently, employment. And it may be negative if the population growth rate is faster than output growth.

**Human Capital** - According to WDI, human capital refers to the knowledge, skills, and health that people accumulate over their lives—is a central driver of sustainable growth and poverty reduction. More human capital is associated with higher earnings for people, higher income for countries, and stronger cohesion in societies. In empirical studies, this is usually proxied as the secondary school enrolment rate (Okafor, 2012; Adejumo et al., 2021). The relationship between employment and the coefficient of human capital development ( $\beta_6$ ) is expected to be positive.

**Government consumption expenditure-** According to WDI, this refers to all current expenses incurred by the government on goods and services (including employees' remuneration). The scope of such spending is not expected to improve employment. Instead, it may negatively affect employment since the government will have less to invest because resources are limited. Since it



also includes national defense and security spending, this expenditure is expected to have increased in Nigeria in the past few years because of the terrorism and insurgencies ravaging every part of the country. Thus, investment expenditure and job creation may be the alternative forgone (Fosu, 2019). As such, the relationship between employment and the coefficient of government consumption expenditure ( $\beta_7$ ) is expected to be negative.

**Economic Freedom-** According to the Heritage Foundation, the economic freedom index measures the impact of liberty and free markets around the globe. The index has four major components: the rule of law, government size, regulatory efficiency, and open markets. The components involve property rights, judicial effectiveness, government integrity, business freedom, labor freedom, monetary freedom, tax burden, government spending, trade freedom, investment freedom, and financial freedom, among others. I anticipate a positive relationship between the coefficient of Economic freedom ( $\beta_8$ ) and employment.

## CHAPTER 5: RESULTS AND DISCUSSION

### 5.1 Results

In this section, the descriptive statistics for all the data employed, correlation matrices for aggregate and agricultural sector employment, and the multiple linear regression results are presented and discussed.

From Appendix 1A, 30-year datasets were employed except for the economic freedom index, which started in 1995 because the data was not available for 1991-1994. Over the years, the mean employment in the agricultural sector has been 44 percent. This suggests that the sector has been essential in terms of employment in Nigeria. The range of inflation over the years is 67 percent. Also, population growth in the last 30 years has been phenomenal. The maximum population is more than double the minimum value. In addition, human capital, proxied as secondary school enrolment, has significantly improved over the years. The maximum secondary school enrolment between 1991-2020 is four times the minimum within the same period. Therefore, it is intuitive to investigate the correlation relationship between these variables.

As can be seen in Appendix 2A, the correlation result for the aggregate employment model were as expected. For example, inflation and population growth showed a positive relationship. Demand-pull inflation is expected, especially when the population grows faster than production. Also, government consumption expenditure increases as the population increases. In addition, foreign direct investment inflow increased as economic freedom increased. This may suggest that the freer the economy is, the higher the rate of foreign investment. The correlation showed that increased FDI has not been beneficial to employment in the agricultural sector. Also, a positive relationship exists between agricultural output and employment in the agricultural sector. Moreover, employment in the agricultural sector increases as inflation increases. This is in tandem

with the Phillips curve theory which claims that employment improves as inflation increases (Phillips, 1958).

The primary purpose of this study is to investigate the impact of trade liberalization on the agricultural sector and the aggregate employment in Nigeria.

Table 1. Regression result of trade openness and employment in Nigeria

Variable	Aggregate Employment Coefficients (P-value)	Agriculture Employment Coefficients (P-value)
FDI	0.0036 (0.349)	-0.0490 ( <b>0.027</b> ) **
TRADE OPENNESS	0.0319 (0.232)	0.2829 (0.063)
AGR GDP	0.0017 (0.069)	0.0126 ( <b>0.016</b> ) **
INFLATION	0.0002 (0.481)	0.0020 (0.111)
Adjusted R <sup>2</sup>	0.08	0.45

Note. \*\*\* and \*\* denote significance at 1% and 5%, respectively

In Table 1 above, using data from 1991-2020, the result from the multiple linear regression using a log-linear functional form shows that foreign direct investment, trade openness, inflation, and agricultural share of GDP do not significantly affect aggregate employment in Nigeria.

Therefore, the study rejects the first hypothesis that trade openness has a positive effect on aggregate employment in Nigeria. Although Nigeria is labor-abundant, openness did not enhance its aggregate employment. The study also provides evidence to reject the third hypothesis that FDI has a positive effect on aggregate employment in Nigeria when other factors are held constant. Likewise, when other factors are held constant, the agricultural output does not drive aggregate employment in Nigeria. Therefore, we also reject the fifth hypothesis that the agricultural share of the GDP has a positive effect on aggregate employment in Nigeria.

The model also showed a low adjusted R<sup>2</sup> value (8 percent). This means that the four variables explain only 8 percent of changes in aggregate employment in Nigeria. This suggests that other

significant determinants of aggregate employment in Nigeria have not been included in the model.

On the other hand, the result of the impact of trade liberalization on employment in the Nigerian agricultural sector in the third column showed a different pattern compared to aggregate employment. Overall, the adjusted  $R^2$  value is higher when compared to the aggregate employment model. It suggests that the independent variables are responsible for 45 percent of changes in the agricultural sector employment. Increased FDI in the economy reduced employment in the Nigerian agricultural sector. A unit increase in foreign direct investments reduced employment in the agricultural sector by five percent. This could be because the FDI inflow to Nigeria does not actively engage the abundant labor in the agricultural sector. The practice of agriculture in Nigeria is still majorly subsistence and labor-intensive. Therefore, the study rejects the fourth hypothesis that FDI has a positive effect on employment in the Nigerian agricultural sector. Also, the result showed that agricultural output is a driver of employment in the sector. A unit increase in agricultural output increased employment in the sector by one percent. However, inflation and trade openness do not significantly affect employment in the sector. Therefore, this study rejects the second hypothesis that trade openness has a positive effect on employment in the Nigerian agricultural sector.

Table 2. Regression result of trade openness and employment in Nigeria with control variables

Variable	Aggregate Employment Coefficients (P-value)	Agriculture Employment Coefficients (P-value)
FDI	0.9714 ( <b>0.029</b> ) **	-0.3938 ( <b>0.036</b> ) **
TRADE OPENNESS	-0.3972 (0.845)	2.2118 ( <b>0.018</b> ) **
AGR GDP	-0.0624 (0.312)	0.0244 (0.351)
INFLATION	-0.0276 (0.148)	0.0016 (0.837)
TOTAL POPULATION	-2.0432 (0.069)	-5.7802 ( <b>0.001</b> ) ***
HUMAN CAPITAL INDEX	0.0821 (0.915)	-0.0654 (0.842)
GOVERNMENT CONSUMPTION EXPENDITURE	0.0248 (0.870)	-0.0151 (0.814)
ECONOMIC FREEDOM INDEX	0.1040 (0.331)	0.0808 (0.085)
Adjusted R <sup>2</sup>	0.75	0.99

Note. \*\*\* and \*\* denote significance at 1% and 5%, respectively

In Table 2, the four control variables were included in the baseline model using a linear-linear functional form. The control variables include human capital development, total population, government consumption expenditure, and economic freedom index. Trade openness does not significantly impact aggregate employment in Nigeria as shown in the second column. Thus, the study rejects the first hypothesis that trade openness has a positive effect on aggregate employment in Nigeria. Also, the Agriculture share of the GDP does not significantly affect the employment rate within the period. Again, this study rejects the fifth hypothesis that agricultural output has a positive effect on aggregate employment in Nigeria. However, a unit increase in FDI increased employment by one unit. Therefore, I do not reject the third hypothesis that FDI has a positive effect on aggregate employment in Nigeria. The human capital index, proxied as secondary school enrolment, does not significantly improve employment. Similarly, population growth, government consumption expenditure, and the economic freedom index do not significantly affect employment. Compared to the aggregate employment model in table 1, the R<sup>2</sup> value in table 2 is higher. This shows that the independent variables in this model are responsible for 75 percent of Nigeria's aggregate employment variations.

Furthermore, in Table 2, the third column shows the effects of the inclusion of control variables on the agricultural sector employment. The control variables include human capital development, population growth, government consumption expenditure, and economic freedom. Trade openness, foreign direct investments, and total population significantly affect employment in the Nigerian agricultural sector. Again, foreign direct investments in Nigeria showed an inverse relationship with employment in the agricultural sector. This is evident and consistent in both models. A unit increase in FDI decreased employment in the sector by 0.4 units. This is not in tandem with the fourth hypothesis. Hence, the study rejects the fourth hypothesis that FDI has a positive effect on employment in the Nigerian agricultural sector. The agricultural share of the GDP does not significantly affect employment in the sector in this model. On the other hand, a unit increase in trade openness increased employment in the agricultural sector by two percent. This implies that trade openness is beneficial to agricultural sector employment. Thus, I do not reject the second hypothesis that trade openness has a positive effect on employment in the agricultural sector. In addition, a unit increase in the total population decreased employment in the agricultural sector. This suggests that Nigeria's teeming population may be agriculture averse. This is confirmed by the correlation matrix, which shows a significant and robust negative correlation between agricultural employment and total population between 1991 and 2020.

With respect to the research objectives, the control variables do not significantly moderate the effect of trade on aggregate employment since none of them was significant at five percent significance level. However, in table 2, the total population is a significant predictor of trade effects on employment in the Nigerian agricultural sector.

Summarily, the results in table 2 show that the impact of trade liberalization on aggregate employment and agricultural sector employment differs. Trade openness significantly impacts the agricultural sector employment while it has no significant effect on aggregate employment. Also, FDI had contrasting effects on aggregate and agricultural sector employment in Nigeria. The possible reasons for these variations are identified and policy recommendations were made in the next section.

## **5.2 Discussion**

### **5.2.1 Foreign Direct Investment and Employment in Nigeria**

Folawewo and Adeboje (2017) asserted that the employment effect of FDI depends on the type of FDI, the nature of the sector in which the FDI is directed, and the state of the production technology available in the sector. FDI has been broadly categorized into Greenfield and Brownfield investments in the literature. Greenfield is a type of FDI where the investors build from ground up while Brownfield is one where the existing facilities is purchased or leased. The latter is sometimes called Mergers and Acquisition (M&As). Jeppesen and Mainguy (2007) and Strat et al., (2015) argued that while Greenfield investments have positive effects on employment, Brownfield investments have negative or no effect at all on employment. The regression result in table 2 showed that the impact of FDI on aggregate employment and agricultural sector employment differs. The effect of foreign direct investment on overall employment is positive. Therefore, increasing the inflow of investment into the country will improve overall employment in Nigeria. The study also confirmed the finding of Fosu (2019) that FDI is highly needed in Sub-Saharan African countries because capital in such countries is inadequate. Since the correlation results also showed that economic freedom drives FDI in Nigeria, efforts to make the economy attractive to investors like property rights, freedom of trade, investment freedom, infrastructure, and monetary

freedom should be put in place as argued by Abor & Harvey (2008). This agrees with the recommendations of Ikeonu (2019) and Alex (2021) that improved property rights and protection will encourage investment and drive employment in Nigeria. It also means that capital flights of FDI and MNCs may further worsen employment in the country (Idris, 2020). Since FDI improved aggregate employment in Nigeria, the study suggests that the FDI inflow to Nigeria may be mostly natural resource-seeking or market-seeking. Agarwal (1997) asserted that, unlike efficiency-seeking FDI, natural resource-seeking and market-seeking FDI improve employment in host countries. Overall, the study confirms the existence of the FDI spillover theory (contagion effect) in Nigeria as posited by Baltabaev (2014).

On the other hand, FDI inflow to Nigeria reduced employment in the agricultural sector. This is in tandem with the study of Matsuyama (1992) and Said and Elshennawy (2010) that while trade may improve the overall welfare in a country, certain sectors may suffer. This occurrence is called Dutch Disease. That is, a situation where improvement in a sector of the economy is at the expense of another sector(s). The opposite effect of FDI on aggregate and agricultural sector employment could mean that FDI inflow improved labor productivity in other sectors and not in the agricultural sector. The negative impact of FDI on employment in the Nigerian agricultural sector is possibly because farming activities in Nigeria is still mainly labor-intensive such that employment improves in sectors that could absorb the foreign direct investments and decreases in the agricultural sector. This is in consonance with the findings of Yanikkaya (2013) that trade has not been beneficial to employment in the labor-intensive sectors of developing countries. Therefore, this study confirms the existence of Dutch Disease in Nigeria and justifies the necessity of more sectoral impact analyses. As such, the inflow of FDI is not just enough. Agriculture promoting FDI's must be intentionally encouraged also. Jeppesen and Mainguy (2007) found that most FDI inflows into



most African countries are Brownfield investments which have no or negative impacts on employment. Thus, extra efforts will be needed to improve employment in the Nigerian agricultural sector. The study also confirms that FDI can be sector sensitive, and we have evidence that agricultural sector employment has experienced FDI crowding out effect (de Mello Jr, 1997; Agosin & Machado, 2005). The employment loss in the agricultural sector must have been compensated for in other sectors for FDI to simultaneously have a positive effect on aggregate employment within the period studied.

### **5.2.2 Protectionism in the Nigerian Agricultural Sector and Inclusiveness**

This study contributes to the argument about protectionism in the agricultural sector. Our result shows that employment in the sector increases as trade openness increases. That is, trade liberalization is beneficial to agricultural sector employment in Nigeria. This implies that protectionism (or other forms of government interventionism) may be counterintuitive in this sector. This is in consonance with the stance of the Austrian School of economics and the new classical economics, which advocates for less government intervention. They argue that market forces are enough to resolve unemployment in an economy (Fosu, 2019). Although Yanikkaya (2013) found that higher trade volumes have not improved employment in most developing countries, the positive impact of trade openness on employment in the agricultural sector could be because Nigeria is a major exporter of agricultural products like cocoa and oil seeds and has a comparative advantage in exporting agricultural products. By extension, policies that restrict trade, such as border closure, and unavailability of foreign exchange (forex), are detrimental to employment in the agricultural sector. Increased investment in the sector, improved road network, and subsidized inputs for farmers will improve agricultural production and then, consequently,

employment in the sector. The correlation results also validated this positive relationship between agriculture's share of GDP and employment in the agriculture sector as seen in Appendix 2B.

Lastly, contrary to popular belief, the study shows that agricultural contribution to GDP is no more the driver of aggregate employment in Nigeria. This is validated by statistics (Statista, NBS), indicating that Nigeria's service sector currently contributes more to the GDP and overall employment. This stance is also supported by the correlation and regressions results that show that although the agricultural share of the GDP improves employment in the agricultural sector, it does not significantly affect aggregate employment in Nigeria.

### **5.2.3 Nigerian economy and its trade performance**

The impacts of variables can only best be evaluated in the context of an individual country's unique conditions (Bloom & Freeman, 1986). The study shows that trade openness does not significantly improve aggregate employment in Nigeria. The result bolsters the findings of Yanikkaya (2013) that increased trade volume has not successfully generated jobs in developing countries. The author argued that current trading policies emphasize trade liberalization at the expense of poverty reduction, human development, and increased output. Therefore, it is unable to achieve sustainable employment growth. Also, since trade openness is a measure of trade volume, that is, import, export, and GDP, factors that impede market processes and production must be addressed for trade openness to have meaningful employment impacts. For example, the protection of property rights, that is, autonomous ownership and control of alienable resources is germane to increased production. This has been argued by Alex (2021) who opined that the absence of property right has been a major concern for investors in Nigeria. Akin to this is reduced government intervention in market prices. The new classical and Austrian economics school of thoughts believe that market

forces in themselves are adequate to correct unemployment (Fosu, 2019). Thus, prices which are outcomes of unimpeded market processes are prerequisites to increased production and output. In addition, transaction costs must be reduced for investors for production to be encouraged. Epileptic power supply, bureaucratic bottleneck, poor road network, and unavailability of foreign exchange (forex) are some factors that have increased transaction costs for businesses in Nigeria. For instance, Orimolade and Olusola (2018) asserted that epileptic power supply in Nigeria has been responsible for increased capital flight of Multinational Corporations in Nigeria (MNCs). Other factors that can promote output and consequently economic prosperity are freedom of contract which allows freedom of exchange of privately owned resources and the existence of dependable rule of law. Thus, Abor and Harvey (2008) maintained that creating enabling legal environment in form of institutions that protect people, businesses and their property is an important requirement for investment and consequently increased production and output.

Against the a priori expectation, agriculture's share of GDP does not improve aggregate employment in Nigeria although it has positive impact of the agricultural sector employment (in table 1). This could be because despite all the effort to diversify the Nigerian economy, the share of agriculture in Nigeria's export remains significantly small. In 2019, agriculture accounted for less than 2 percent of total exports in Nigeria compared to crude oil which accounted for 76.5 percent. Also, between 2018 and 2019, agricultural export declined by 11 percent while agricultural import increased by 12.7 percent during the same period. The latter being Nigeria's highest recorded agricultural import value (Oyaniyan, 2020). All these indicate that the agricultural sector in Nigeria has not been sufficiently triggered and hence its limited impact on aggregate employment in the country.

Contrary to the popular Phillip's curve theory, the study, unlike Raifu (2017) and Onifade et al. (2020) shows that inflation does not improve employment in Nigeria. The high inflation rate in the country could be blamed because Darku and Yeboah (2018) affirm that only a moderate level of inflation can be beneficial. Thus, the study agrees with Orji et al. (2015) that the Phillips curve hypothesis does not hold in Nigeria.

Total population has no significant impact on aggregate employment in Nigeria. This suggests that the increasing population in Nigeria (as seen in the descriptive statistics table in the appendix section) has no effect on the employment situation within the year under study. Thus, the increasing population in Nigeria may not be a menace but can be productively engaged to promote production. Bloom and Freeman (1986) argue that increased population can trigger technological development, economies of scale, and thus employment. On the other hand, total population showed a negative relationship with agricultural sector employment in Nigeria. The implication is that the increasing population in Nigeria are not engaged in the agricultural sector. This could be because the sector is labor-intensive. The human capital index proxied by the level of education has improved over time in Nigeria (as seen in the descriptive statistics table and correlation matrix table in the appendix) and this could make the labor force seek white-collar jobs in other sectors unlike the labor-intensive opportunities in the agricultural sector. Also, the economic freedom index had no impact on employment in Nigeria. This could be because of the nature of the data which comprises of about 12 indicators lumped together.

## **5.2 Post-estimation results**

The study used the Akaike information and Bayesian information criterion tests to choose the best models. Also, multicollinearity test was carried out, especially because of the low adjusted

R<sup>2</sup> value of the aggregate employment baseline model. The Variance Inflation Factor (VIF) confirmed that multicollinearity is absent in all the models. Durbin-Watson d-statistics results also showed that there was no autocorrelation. Finally, Breusch-Godfrey LM test for autocorrelation also confirmed the absence of serial correlation.

This study provides some policy recommendations in the next chapter that may improve the employment contribution of the agricultural sector.

## **CHAPTER 6: CONCLUSION AND RECOMMENDATIONS**

### **6.1 Conclusion and recommendations**

In this last chapter, the study is concluded, and recommendations proffered accordingly.

Unemployment has been a menace in most African countries, especially Nigeria. The stance of

classical trade theories and international trade institutions is that trade will improve employment. However, despite the country's outward trade orientation and enormous economic potential, the unemployment rate has consistently increased over the years. Thus, the study investigated the impact of trade liberalization on employment using data between 1991-2020.

Using the multiple linear regression technique, the study found that the FDI inflow has been detrimental to employment in the agricultural sector, but it has been beneficial to aggregate employment. This implies that the net employment effect of FDI is positive because the loss in the agricultural sector was compensated for by gains in other sectors within the economy. The study opines that the negative effect of FDI on agricultural sector employment could be because the sector is labor-intensive while most FDIs are capital-intensive. The study also found that trade openness improved employment in the agricultural sector. This weakens the argument for protectionism in the sector. This corroborates the claims of the Heckscher-Ohlin model that the abundant factor benefits from trade openness. However, trade openness does not significantly affect aggregate employment in Nigeria. Since trade openness is a measure of trade volumes, protection of private property, limited government interference in market processes, freedom of contract and conducive legal environment are germane for the dividends of trade liberalization to be reaped in the country. Finally, the agricultural share of the GDP showed a positive relationship with the agricultural sector employment.

Based on the findings, the following policy recommendations may improve employment in Nigeria. It is recommended that the government create a favorable economic and legal environment to encourage investors since FDI improved aggregate employment in the country. Good road networks, stable power supply, protection of property rights, reduced business tax,

etc. are possible incentives to foreign investors. In addition, the government should ensure policies that will promote macroeconomic stability within the economy. To improve employment in the agricultural sector, foreign direct investments that will engage the abundant labor and encourage participation in the agricultural sector must be encouraged. This is in consonance with the recommendations of Yanikkaya (2013) and Anyanwu (2013). Otherwise, employment in the sector may continue to decrease. This can be made possible if there is inflow of agriculture promoting FDIs into the sector.

Since agriculture's share of GDP improved the agricultural sector employment, it is intuitive to recommend that policies that will increase output in this sector be put in place. This includes making inputs available and affordable through subsidies, encouraging mechanization, and providing extension services that would reduce incidences of pest and disease outbreaks which reduce agricultural outputs.

In conclusion, trade openness also improved the agricultural sector employment, therefore this study has provided evidence that protectionism policies should be discouraged in Nigeria's agricultural sector. Trade and exchange should be promoted in the sector and as argued by the new classical and Austrian economics school of thoughts, the forces of demand and supply are adequate to control unemployment, independent of the unbridled government interventionism.

## **6.2 Limitations and recommendations for future research**

The major challenge encountered in this study has to do with data. There were a lot of missing data prior to 1991 otherwise the study would have considered 1981 to date. Also, the data were inconsistent across the board. For instance, while NBS, Nigeria puts the year 2020 unemployment rate in the country at 33.3 percent, World Bank data says it is 9.71 percent.

The study compared only the agricultural sector and the aggregate employment. Future studies may want to consider the other sectors of the economy. In addition, some of the control variables like population, government consumption expenditure, and economic freedom show positive relationships in the correlation matrix, as such further studies can be developed around them.

Furthermore, the study considered the impact of trade liberalization on employment in Nigeria, future studies may consider the determinants of unemployment in Nigeria where predictors like private property rights, rule of law, trade freedom, freedom of contract, etc which were identified in this study as probable causes of unemployment in Nigeria can be studied in depth.

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## APPENDIX

### Appendix 1A: Descriptive statistics

Descriptive statistics

VARIABLE	N	Range	Minimum	Maximum	Mean	Std. Deviation
AGR EMPL	30	16.91	33.66	50.57	43.82967	5.666248742
TOTAL EMPL	30	6.014	90.286	96.3	95.2925	1.737452229
TRADE OPENNESS	30	0.616012	0.121232	0.737245	0.378369	0.134215347
FDI NET INFLOW	30	8.54E+09	3E+08	8.84E+09	3.29E+09	2630430920
INFLATION CPI	30	67.44749	5.388008	72.8355	18.35389	16.83810668
AGR GDP	30	16.97483	19.99025	36.96508	24.42434	3.856622391
POPULATION	30	1.08E+08	97667632	2.06E+08	1.45E+08	32949909.13
ECONOMIC FREEDOM	26	11.2	47.3	58.5	53.581	3.556
GOVT CONSUMPTION	30	8.537105	0.911235	9.44834	4.540054	3.05276672
HUMAN CAPITAL	30	9699380	3123277	12822657	6596240	2910181.994

**Appendix 2A: Pearson correlation matrix for aggregate employment**

Appendix 2A. Pearson correlation matrix for aggregate employment

VARIABLE		EMPLWB	T.OPEN	FDI	INFLA	AGDP	POP	E.FREE	GCE	HC
EMPLWB	Coef	1								
	Sig.									
TRADE OP	Coef	0.282	1							
	Sig.	0.131								
FDI	Coef	0.115	0.164	1						
	Sig.	0.545	0.388							
INFLATION	Coef	0.121	0.206	-0.36	1					
	Sig.	0.523	0.274	0.05						
AGR GDP	Coef	0.304	-0.029	-0.19	0.001	1				
	Sig.	0.102	0.878	0.32	0.996					
POP	Coef	-.693**	-0.277	.491**	.494**	-.367*	1			
	Sig.	<.001	0.139	0.01	0.006	0.046				
ECO FREE	Coef	-.527**	0.006	.421*	-.489*	.544**	.763**	1		
	Sig.	0.006	0.978	0.03	0.011	0.004	<.001			
GCE	Coef	-0.2	0.024	.856**	-.417*	-0.349	.711**	.622**	1	
	Sig.	0.301	0.898	<.001	0.022	0.059	<.001	<.001		
HUMAN CAP	Coef	-.785**	-0.279	0.25	-0.33	-.367*	.929**	.586**	.517**	1
	Sig.	<.001	0.135	0.18	0.075	0.046	<.001	0	0	

Note. \*\* and \* denote significance at 1% and 5% at 2-tailed, respectively

**Appendix 2B: Pearson correlation matrix for aggregate employment**

Appendix 2B. Pearson correlation matrix for agricultural sector employment

VARIABLE		A. EMP	T.OPEN	FDI	INFLA	AGDP	POP	E.FREE	GCE	HC
AGR EMP	Coef	1								
	Sig.									
TRADE OP	Coef	0.256	1							
	Sig.	0.172								
FDI	Coef	-.516**	0.164	1						
	Sig.	0.004	0.388							
INFLATION	Coef	.464**	0.206	-0.36	1					
	Sig.	0.01	0.274	0.05						
AGR GDP	Coef	.414*	-0.029	-0.19	0.001	1				
	Sig.	0.023	0.878	0.32	0.996					

POP	Coef	-.994**	-0.277	.491**	-.494**	-.367*	1			
	Sig.	<.001	0.139	0.01	0.006	0.046				
ECO FREE	Coef	-.749**	0.006	.421*	-.489*	-.544**	.763**	1		
	Sig.	<.001	0.978	0.03	0.011	0.004	<.001			
GCE	Coef	-.732**	0.024	.856**	-.417*	-0.349	.711**	.622**	1	
	Sig.	<.001	0.898	<.001	0.022	0.059	<.001	<.001		
HUMAN CAP	Coef	-.927**	-0.279	0.25	-0.33	-.367*	.929**	.586**	.517**	1
	Sig.	<.001	0.135	0.18	0.075	0.046	<.001	0	0	

Note. \*\* and \* denote significance at 1% and 5% at 2-tailed, respectively

### Appendix 3A: Unit root test for aggregate employment model (ADF)

#### Appendix 3A. Unit root test (Augmented Dickey Fuller)

Variable	Augmented Dickey Fuller (ADF)		
	Level (P-value)	First Difference (P-value)	Conclusion
TEMP	-2.240(0.1922)	-5.382(0.0000)***	I(1)
FDI	-2.059(0.2612)	-1.475(0.5458)	Not stationary
TRADE OPENNESS	-2.130(0.2326)	-5.091(0.0000)***	I(1)
AGR GDP	-1.125(0.7051)	-2.814(0.0563)	Not stationary
INFLATION	-10.734(0.0000)***	-5.032(0.0000)***	I(0) I(1)
POP	3.808(1.000)	-0.356(0.9172)	I(0) Not significant
HCI	0.600(0.9876)	-1.919(0.3231)	Not stationary
GCE	-1.343(0.6093)	-1.985(0.2932)	Not stationary
EF	-0.440(0.9032)	-1.968(0.3008)	Not stationary

Note. \*\*\* and \*\* denote significance at 1% and 5%, respectively

### Appendix 3B: Unit root test for agricultural sector employment model (ADF)

#### Appendix 3B. Unit root test (Augmented Dickey Fuller)

Variable	Augmented Dickey Fuller (ADF)		
	Level (P-value)	First Difference (P-value)	Conclusion
AEMP	2.325(0.9990)	-1.082(0.7221)	Not stationary
FDI	-2.059(0.2612)	-1.475(0.5458)	Not stationary
TRADE OPENNESS	-2.130(0.2326)	-5.091(0.0000)***	I(1)
AGR GDP	-1.125(0.7051)	-2.814(0.0563)	Not stationary
INFLATION	-10.734(0.0000)***	-5.032(0.0000)***	I(0) I(1)
POP	3.808(1.000)	-0.356(0.9172)	I(0) Not significant
HCI	0.600(0.9876)	-1.919(0.3231)	Not stationary
GCE	-1.343(0.6093)	-1.985(0.2932)	Not stationary
EF	-0.440(0.9032)	-1.968(0.3008)	Not stationary

Note. \*\*\* and \*\* denote significance at 1% and 5%, respectively

### Appendix 4A: Johansen Cointegration Test for the aggregate employment model

Appendix 4A. Johansen Cointegration Test for the aggregate employment model

Maximum Rank	Trace Statistics K=1		Maximum Eigen Values K=1	
	$\lambda$ (trace)	5 % critical values	$\lambda$ (Max)	5% critical values
0	-	192.89	-	57.12
1	-	156	-	51.42
2	-	124.24	829.004	45.28
3	-	94.15	756.393	39.37
4	-	68.52	0	33.46
5	-	47.21	0	27.07
6	-	29.68	0	20.97
7	-	15.41	0	14.07
8	-	3.76	0	3.76
9	-	-	-	-

Note. Maximum Rank denote the number of cointegrating vectors and K represents the number of lags in the unrestricted VAR Model

### Appendix 4B: Johansen Cointegration Test for the agricultural sector employment model

Appendix 4B. Johansen Cointegration Test for the agricultural sector employment model

Maximum Rank	Trace Statistics K=1		Maximum Eigen Values K=1	
	$\lambda$ (trace)	5 % critical values	$\lambda$ (Max)	5% critical values
0	-	192.89	-	57.12
1	-	156	-	51.42
2	-	124.24	844.9464	45.28
3	-	94.15	791.9870	39.37
4	-	68.52	0	33.46
5	-	47.21	0	27.07
6	-	29.68	0	20.97
7	-	15.41	0	14.07
8	-	3.76	0	3.76
9	-	-	-	-

Note. Maximum Rank denote the number of cointegrating vectors and K represents the number of lags in the unrestricted VAR Model

