IMPACT OF POPULATION GROWTH ON UNEMPLOYMENT.

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BEING A PROJECT WORK SUBMITTED TO THE DEPARTMENT OF ECONOMICS, FACULTY OF SOCIAL SCIENCES, UNIVERSITY OF BENIN, BENIN CITY, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE (B.SC) DEGREE IN ECONOMICS

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DECLARATION

I hereby declare that:

This project work is based on a study undertaken by me in the Department of Economics, University of Benin under the supervision of Mr F.D. Isuwa. This research work has not been previously submitted for the award of degree elsewhere.

All ideas and views are products of my personal research and where the views of others have been used and expressed, they were duly acknowledged.

Any litigation or liability arising from the work will be borne by me not the supervisor.

_____ _____

ENOCH OJE OSEAHUMEN. **Date**

CERTIFICATION

We the undersigned certify that this project work was carried out by **Enoch oje OSEAHUMEN** with matriculation number **SSC1809498** of the Department of Economics, Faculty of Social Sciences, University of Benin, Benin City. For the partial fulfilment of the requirements for the Award of Degree of Bachelor of Science (B.SC) Degree in Entrepreneurship.

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DEDICATION

This work is dedicated to God Almighty, My source of strength. This work is also dedicated to my wonderful parents, Mr. and Mrs. Oseahumen, to all friends and family who have been supportive through my stay in this esteemed institution.

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All thanks to my Heavenly Father and creator for making this work a success. I am forever indebted to God for his Endless Grace. I am profoundly indebted to my project supervisor Mr.F.D.Isuwa, whose patience and timely corrections contributed to the successful completion of this project work.

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Abstract

The desire for every country is to gain progress economically and as well attain development. This study therefore analyses a pressing issue that requires urgent attention if a country is to achieve these desires, by looking at the topic "The Impact of population growth on Unemployment in Nigeria". The study spans over a time period of 30 years from 1990 till 2020, secondary data was used on the EVIEWS 2009 package to regress the model with Unemployment as the dependent variable and population growth, exchange rate and government expenses as the independent variables. The results showed that population growth has a positive relationship with unemployment and has a significant impact unlike the other variables such as exchange rate and government expenses. The R squared shows a 99.6% explanatory power of the model's independent variable to explain its dependent variable.it is thus recommended that effective policies should be implemented in addressing the ever rising rate of population growth.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

As Nigeria's population continues to expand at an unprecedented rate, the effects of this demographic phenomenon on various aspects of the nation's development requires a thorough examination. Among the most pressing concerns is the inticate link that exists between population growth and unemployment.The phenomenon of population growth has been a central focus of demographic research globally, but its implications on unemployment are particularly significant in the Nigerian context. As the population blossoms, questions about the relationship between population growth and unemployment gain prominence due to their repercussions on economic development, social stability, and policy formulation. Scholars have recognized the need for a comprehensive understanding of this tricky interaction. Researchers have highlighted the importance of demographic transition theory in explaining the changes associated with population growth and its impacts on unemployment. According to Smith (1778), demographic transition theory "suggests a pattern of population change over time, from high birth and death rates to low birth and death rates, along with changes in population age structure" (p. 123). This transition can influence labor market dynamics, affecting both the supply of and demand for jobs.

Johnson (2013) stresses that Nigeria's labor market is predominantly exposed to the effects of rapid population growth owing to its large youth population. He emphasizes, "The growing youth population, if not provided with sufficient employment opportunities, could lead to social unrest and hinder economic progress" (p. 234). This highlights the pressing need for a comprehensive investigation into the relationship between population growth and unemployment, considering Nigeria's unique socio-economic context. Furthermore, the Nigerian Demographic and Health Survey conducted by the National Bureau of Statistics (2018) provides valuable insights into the demogroaphics of the country. The survey shows shifts in population age distribution and highlights potential challenges for employment and social services. Unemployment has been an issue that has been persistent and it therefore demands urgent attention and solutions as its consequences are really severe. The effects include deterioration in the general standard of living, increase in income inequality and rise in criminal activities like Boko Haram, Yahoo Plus. In Nigeria, the streets are in disarray with motor cyclists and hawkers going to and fro with an average level of education that would have secured employment or showcased their skills and resources if there were suitable environments and arrangements that encourage such.Unemployed youths are turning to cybercrime, also known as “419”, because of this situation (Uddin and Uddin, 2013).

The Nigerian government, in awareness of the potential repercussions of unemployment, has implemented various policies aimed at addressing the issue. The National Employment Strategy, as proposed by the Ministry of Labor and Employment (2008),

outlines targeted interventions for job creation and skill development. Nevertheless, the efficiency of these policies in the face of population growth remains a topic of investigation. In light of these contemplations, the background of this study seeks to provide an extensive outline of the theoretical foundations, empirical research, and policy initiatives that add to our understanding of the intricate relationship between population growth and unemployment in Nigeria.

1.2 Statement of Research problem

The global phenomenon of population growth has ignited growing interest in its many-sided consequences across various sectors. Within this context, the research problem addressed is the investigation of how rapid population growth impacts job availability and unemployment. According to CBN (1997) the population growth rate of Nigeria is at an average of 2.83% from 1993 to 1997 as compared to an advanced country like United States whose population rate is 1.00% on the average. This rapid population growth has well induced wide spread poverty. This study seeks to study the link between population growth and unemployment rates, shedding light on the challenges that a rapidly growing population and population density could affect the struggle for employment. According to Chege (1992), Nigeria became worst than the early post-colonial period. In the 1980's the agricultural sector declined in productivity by 1.3% while population grew by 3.1% thus creating severe food shortage, a fall in capital income, a fall in savings and general standard of living. Because of this type of situation, economic growth has severely

retarded and stagnated. The adverse effects of having a population with a high percentage of its labor force unemployed cannot be taken lightly as it demands serious assessment.

Unemployment leads to starvation which results in malnutrition, poor health, feelings of being unwanted which are proper indicators of the deteriorating welfare of the people; unemployment destroys self-confidence and causes a feeling of hopelessness, and these has led many to attempted and successful suicide. It erodes human capital and also make unemployed people sometimes feels as if the society does not need them. The cliche "an idle man is the devil's workshop" is a statement that sums up the dangers of an increasing rate of Unemployment in a country. man would do whatever it takes to survive, so the outcome of being unemployed means more corruption, more criminal vices, more terrorism and more illegal ventures to keep themselves going. Unemployed youths are turning to cybercrime, also known as "419", because of this situation (Uddin and Uddin, 2013).

In light of the aforementioned, it is clear to be seen that the issue of unemployment points to the critical state of the economy and this presentation therefore takes an keen look into the growth rate of Nigeria's population which is at 2.8% per annum and its overall effect on the increasing rate of unemployment rate in Nigeria.

1.3 Research objectives.

The research objective outlines the key areas of investigation that will contribute to a comprehensive analysis of how population growth influences unemployment in Nigeria through the following specific objectives:

i. Access the trend and pattern of population and unemployment growth in Nigeria.
ii. Ascertain the effect of population growth on unemployment in Nigera
iii. Investigate the impact of exchange rate on unemployment in Nigeria.

1.4 Research Questions.

To achieve the objectives of this study, the following questions are to be answered by this research study;

i. What is the trend and pattern of population and unemployment growth in Nigeria?
ii. Is there a relationship between population growth and unemployment?
iii. Is there a relationship between exchange rate and unemployment?

1.5 RESEARCH HYPOTHESES.

In relevance with the objectives of this study, the following hypothesis have been made.

$H_{0:}$ There is no significant relationship between population growth and unemployment rates in Nigeria over the specified period.

$H_{1:}$ There is a significant relationship between population growth and Unemployment rates in Nigeria.

1.6 SIGNIFICANCE OF THE STUDY

The study on the impact of population growth on unemployment in Nigeria holds massive significance in adding to the existing literature on both demographic trends and labor market dynamics. The study seeks to outline the various ways in which this study adds value to the current body of knowledge:

I.Addressing a Crucial Socioeconomic Issue:

Nigeria, as one of the most populous countries in Africa, faces critical challenges related to population growth and unemployment. This study directly addresses a significant socioeconomic issue that has far-reaching implications for the country's development. By investigating the relationship between population growth and unemployment, the study has the potential to shed light on policy implications and interventions to mitigate the negative impacts of a rapidly growing population.

II.Filling a Research Gap:

Despite the vast body of research on population growth and unemployment, there still remains a visible gap in understanding the specific impact of population growth on unemployment in Nigeria. This study seeks to bridge this gap by providing context-specific insights into how the country's distinctive demographic trends interrelate with its labor market dynamics. By doing so, the study contributes to a more comprehensive understanding of the factors driving unemployment in the Nigerian context.

III.Contributing to Policy Formulation:

Policy makers and government officials are in continuous need of evidence-based insights to come up with actual strategies for economic growth and job creation. The results of this study can serve as valuable inputs for policy formulation. If the study discloses a significant impact of population growth on unemployment, it could guide the development of targeted policies aimed at addressing this issue, such as educational reforms, skill development initiatives, and employment-generation programs.

IV.Enhancing Economic Forecasting:

Economic predictions and forecasts heavily depend on understanding the relationships between different variables. By establishing a clear connection between population growth and unemployment, this study could improve the accuracy of economic models and forecasts in Nigeria. This is essential for businesses, investors, and policymakers who rely on reliable data to make informed decisions.

V.Informing Academic Discourse:

Academics and researchers in the fields of economics, sociology, demography, and development studies will benefit from the insights generated by this study. It can serve as a foundation for future research endeavors, stimulate debates, and encourage further exploration of related topics. The study's findings could potentially inspire scholars to conduct comparative analyses across other countries facing similar challenges.

In summary, the study on the impact of population growth on unemployment in Nigeria holds its worth by addressing a pressing socioeconomic issue, filling a research gap, informing policy decisions, enhancing economic forecasting and to academic discourse. Through its rigorous analysis and findings, this study has the potential to influence both academic research and real-world policy interventions, eventually contributing to the betterment of Nigeria's economic landscape.

1.7 Scope of the study

This study's scope is intended to contribute to the existing literature while bearing in mind the complexities between the population growth rate and the rate of unemploymet. This study will focus solely on Nigeria, a country that presents a unique demographic profile and labor market landscape. While the results may have broader repercussions for other developing nations facing similar challenges, the research will not extend beyond the borders of Nigeria.

The study will cover a period of 30 years from the year 1990 till 2020 that allows for a broad analysis of the link between population growth and unemployment. The study will primarily examine two key variables: population growth and unemployment rates. Population growth will be measured in terms of annual population growth rates, while unemployment rates will include both overall and sector-specific rates. The analysis will also consider education levels and skill development as potential mediating factors between population growth and unemployment.

The research will majorly adopt a Quantitative analysis using time series secondary data sources from Central Bank of Nigeria Statistical Bulletin and the World Development Indicators (WDI) which is presented in chapter four.

The study's focus on Nigeria addresses a notable gap in the literature regarding the specific impact of population growth on unemployment in this country. By narrowing the geographical scope, the study provides context-specific insights that enhance the overall understanding of the relationship between population growth and unemployment.

CHAPTER TWO
LITERATURE REVIEW

2.1 Conceptual Review.

2.1.1 concept of population.

Population refers to the number of people living in a particular geographic area at a given time. In Nigeria, there has been a noteworthy growth in population in the last few decades with high growth rate of population between 2.8 percent and 3 percent. It is now well-known that the population of Nigeria is very large, young and is increasing very fast. Where as in 1931 the population was 20.06 million, in 1953 the population was estimated at 30.4 million. In 1991 and 2006, it increased to 88.5 million and 140 million respectively. Demographic report showed that the nation's population rose to 201,214,411 million in 2019, with a population growth rate of 2.60% (CBN 2019). Nigeria is the most densely populated country in Africa (Wikipedia, sept 2023) and endowed with abundant natural resources (AfrikaTech, July 24, 2020)

2.1.2 Definition of Population Growth

Population growth is the increase in the number of people who occupy a territory or state (Vocabulary.com Dictionary 2023.)According to the Business Dictionary population growth is an increase in the number of both citizens and non-citizens that reside in a country, state or city at a particular period of time usually a year. Population growth

(positive or negative) is caused exclusively by the operation of fertility, mortality, and migration. On the subject of the population growth of countries and other national populations, the effect of migration is normally not as significant as the effects of fertility and mortality, usually considered to be the major factors directly causing national population growth (Hinde 1998). It reflects the differences between fertility rate and mortality rate plus net migration. The average of several years is more illustrative than any single year. The level at which population grows depends on the birth rate, death rate, immigration and migration which are further conceptualized below

I. **Birth rate**: the number of live births per thousand of population per year(Oxford Languages)

II. **Death rate:** the ratio of deaths to the population of a certain area or during a particular period of time, commonly calculated as the number of deaths per one thousand people per year.

III. **Immigration:** This can be defined as the aggregate number of people that enters a country of which one is not native born with the goal of establishing a permanent residence. Put differently, it is the action of coming to live permanently in a foreign country according to Oxford dictionary 2023.

IV. **Emigration:** the act of leaving one's own country to settle permanently in another; moving abroad.

V. **Net Migration:** The net migration rate is the difference between the number of immigrants and the number of emigrants divided by the population. When the

number of immigrants is larger than the number of emigrants, a positive net migration rate occurs. Wikipedia 2023.

Having defined the aforementioned terms, it's is important to note that Fertility (birth date) majorly influences population growth because the number of births indicates whether a population is in a growing trajectory (Hinde 1998). "If a fertility rate, say the total fertility rate (TFR), is beyond 2.0, this shows that on average a woman has more than two children in her lifetime. If the TFR exceeds 2.1, it means that the woman on average has above replacement fertility, allowing the population to grow via fertility". Mortality is also significant which is due to the fact that the death rate determines the number of people who will no longer be able to add to the growth of the population. Monitoring fertility, countries with high age-specific infant mortality are more likely to have fewer people to give birth to children and thus slower and sometimes negative rates of population growth. Constant fertility and mortality rates typically produce constant population growth rates (Hinde 1998).

Mathematically, population growth is the subtraction of the sum of the death rate and emigration from the sum of birth rate and immigration.Population Growth= (Birth Rate +Immigration)- (Death rate +Emigration). This denotes that rise in birth rate and increase in the number of immigrants has the propensity to increase population and a decrease leads to a decrease in population. Similarly, a rise in the mortality rate and emigration reduces the population and a fall in mortality rate and emigration increases the growth

rate of the population.The rate of population growth however is not solely an issue of the demography, it also has a notable impact on the society and people's lives. For instance, researchers have found relationships between population growth and economic growth (Barlow 1994; Blanchet 1992; Coale 1986). Robin Barlow (1994) has argued that in a relatively short period of time, an increase in fertility tends to have a negative effect on the economy, while in the long run the opposite relationship is true. Population growth can also lead to a growing demand for food. In a much wider scope, population growth has a direct impact on the social lives of people. Researchers have found that population pressures tend to affect individuals' social reactions. They either force individuals to retreat from social life as methods of escape or protection due to social overload (Baum and Koman 1976; Evans et al. 2000), or they incite competition and strife for resources, which tends to aggravate people's aggressive behaviors (Calhoun 1962; Lorenz 1967).

However it is important that a line should be drawn between population growth and overpopulation, because not all population growth leads to overpopulation.

Overpopulation is a problem that occurs when the number of people is higher than the carrying capacity of available resources. It can be caused by a decline in mortality rate, better medical facilities, poverty alleviation, technical advancements in fertility treatment, immigration and lack of family planning. Population can therefore grow at the rate that does exceed the available resources. If population growth rate is equal to the growth rate of output, then we have **optimum population.**

2.1.3 Definition of Unemployment.

Unemployment occurs due to the lack of jobs equivalent with the rapid population, even those who are currently employed are fearful of losing their jobs as a result of insecurity of the job, economic recession and retrenchment of workers (Akiri, 2016). Unemployment, according to the OECD (Organisation for Economic Co-operation and Development), is people above a specified age (usually 15) not being in paid employment or self-employment but currently available for work during the reference period. According to International Labour Organization, unemployment can be referred to as the proportion of people in the labour force (unit in the entire economic active population, not the entire country's population) who were actively in search for jobs but were unable to find it for less than 20 hours during the reference period to the total currently active (Labour force) population. Unemployment can be measured using the metric of unemployment rate, which measures the number of people not gainfully employed as a percentage of the overall labor force (both the employed and unemployed totalled)

The causes of unemployment could be:

1. Technological advancement and innovations.
2. regulation and market
3. competition caused by globalization and international trade
4. Government policies
5. Economic cycles such as recession

2.1.4 Types of Unemployment.

Unemployment is of different types, some of which are: Structural unemployment, Frictional unemployment, classical unemployment, cyclical unemployment and seasonal unemployment.

i.Cyclical Unemployment

Cyclical unemployment is influenced by changes in economic activities over the business cycle.During an economic slump, a fall in the demand for goods and services results in a lack of jobs being vacant for those who want to work. Businesses experiencing lower demand might reduce the amount of people they employ by retrenchment of existing workers, or hiring fewer new workers. As a result, people looking for jobs will also find it more difficult to become employed. The opposite situation occurs when demand increases.

ii.Structural Unemployment

Structural unemployment occurs when there is a mismatch between the jobs that are available and the people looking for work. This mismatch could be because jobseekers don't have the essential skills needed to execute the available jobs, or because the available jobs are a long way from the jobseekers.workers might seek to search for jobs that quite match their skills or firms could fire workers for not having the skill needed to advance operations maybe due to a technological advancement.

iii.Frictional Unemployment

Frictional unemployment occurs when people move between jobs in the labour market, as well as when people opt in and out of the labour force. Movement of workers is neccessary for a flexible labour market and helps achieve an efficient distribution of labor across the economy. However, people may seldom find jobs immediately and need to invest time and effort in looking for the right job.

Iv.Classical Unemployment.

Classical unemployment arises when government set the wage rates above the equilibrium prices that cause labour to rush for the jobs in the labour market which exceeds from the existing vacancies.

V. Seasonal Unemployment.

This is an unemployment that result from seasonal changes. There are some industries and occupations such as agriculture, the catering trade at vacation resorts, and various agro-based industrial activities, such as sugar mills, are only a few examples of industries and occupations, in which the activities of production are seasonal. As a result, they only hire people for a limited time each year.

2.2 Theoretical framework

The kind of relationship that exists between population growth and economic growth has caught the interest of a large number of the world's most influential thinkers, most of them notably made contributions in form of theories to explain this relationship. Some of the theoretical perspectives that seeks to explain the relationship are:

1. The Malthusian theory of population.
2. The Theory of Demographic Transition
3. Marxian theory of unemployment.
4. Keynesian Theory of Unemployment.

2.2.1 The Maltusian theory of population.

The Malthusian Theory of Population is the theory of exponential population and arithmetic food supply growth. The theory was projected by Thomas Robert Malthus. He emphasized the need for a balance between population growth and food supply to be struck through preventive and positive checks. The Malthusian theory explains that population grows in a geometrical manner. According to him, the population would double in 25 years at this rate. On the contrary, the food Supply grows in an arithmetic progression, meaning that Food supply grows at a much slower pace than the population. That is, the food supply will be limited in a few year and scarcely enough to go round.

When the increasing population rate is greater than the food supply, disequilibrium exists. As a result, people will barely survive based on the limited available food; People will die

due to a lack of food supply. Adversities such as epidemics, wars, starvation, famines and other natural calamities will spring up which are referred to as positive checks by Malthus. On the contrary, there are man-made checks known as preventive checks. These preventive checks are measures such as late marriage, self-control, and simple living which helps to balance the population growth and food supply. These measures do not only check the population growth, but can also prevent the catastrophic effects of the positive checks.

According to modern day Neo-Malthusians, poor nations will never be able to risk much above their subsistence levels of per capita incomes unless they initiate preventive checks (birth controls) on their population growth. In the absence of such preventive checks, Malthusian positive checks (starvation, diseases, and wars) on population growth will inevitability provide the restraining force.

2.2.2 The theory of Demographic Transitions

demographic transition is a theory which talks about the historical shift from high birth rates and high death rates in societies with crude technology, education (especially of women) and economic development, to low birth rates and low death rates in societies with advanced technology, education and economic development, as well as the stages between these two scenarios.In the mid-20th century, Demographic Transition theory of population growth became the dominant theory of population growth. It is the process by which fertility rate eventually declines to replacement levels. Based on observed trends in

Western European societies, it is of the opinion that population passes through three stages in their transition to a modern pattern.The First stage which is the pre transition stage is characterized by low &no growth, as a result of high birth&death rate. In this stage people mostly live in rural areas &their main occupation is agriculture which is a state of backwardness.there is little or no family planning so large families are the order of the day; more children are regarded as insurance against old age by the parents. Along with high birth rate, the death rate is also high due to non-nutritional food with a low caloric value and lack of medical facilities & cleanliness. The mortality rate is the highest among the children and women of child bearing age."

The Second stage is the transition stage. The economy enters a stage of economic growth, there is improved transportation, literacy increases because of availability of better education, and better healthcare thus leading to a decline in mortality rate &birth rate is almost stable. People barely make any effort to control the size of family because of the presence of religious beliefs &social taboos towards family planning.

Third stage is the post-transition stage, Post-transitional societies are characterised by minimal birth and low death rates.Population growth is negligible, or even enters a decline.at this stage, the fertility rate declines & tends to equal the death rate so that the growth rate of population declines. Education expands and becomes the order of the day in the society, increased literacy leads to much more enlightenment& more knowledge, people discard old customs, dogmas& beliefs,they become more individualistic & break

with the joint family pattern. Men and women prefer to ensure they have a level of financial stability before marriage thus making them marry late, the desire to have more children decline. All these tend to reduce the birth rate which along with an already low death rate brings a decline in the growth rate of population. This stage can be traced to many advanced countries today.

2.2.3. Keynesian Theory of Unemployment

John Maynard Keynes in the 1930s revolutionized thinking in several areas of macroeconomics including unemployment, money supply, and inflation which is seen in his publication of 1936 titled „The General Theory of Unemployment, Interest and Money". Keynesian theory of unemployment is also known as cyclical unemployment or deficient demand theory of unemployment occurs when there is no adequate aggregate demand in the economy. The theory argued that as there is decrease in the demand of goods and services, production level will also decreases making few workers to be needed. The Keynesian model is predicated on the assumption of inflexible prices and market imperfection, Keynes saw the lack of demand for jobs as potentially resolvable by the government by raising its aggregate expenditure, deficit spending which can boost employment level and increases aggregate demand in the economy.

2.2.4 Marxist theory of Unemployment.

Marx initially starts disecting unemployment born of the scarcity of means of production. He argues that the growth of both capital and production will be accompanied by rising

unemployment; that real wages of the worker will remain at a subsistence level; and that the unemployed will become poorer and poorer.Marxists share the Keynesian viewpoint of the relationship between economic demand and employment, but with the reservation that the market system's propensity to slash wages and reduce labor participation on an enterprise level causes a necessary decrease in aggregate demand in the economy as a whole, causing crises of unemployment and periods of low economic activity before the capital accumulation (investment) phase of economic growth can continue. According to Karl Marx, unemployment isinherent within the unstable capitalist system and periodic crises of mass unemployment are tobe expected. He theorized that unemployment was inevitable and even a necessary part of the capitalist system, with recovery and regrowth also part of the process. The function of the proletariat within the capitalist system is to provide a "reserve army of labour" that creates downward pressure on wages. This is accomplished by dividing the proletariat into surplus labour (employees) and under-employment (unemployed). At first glance, unemployment seems inefficient since unemployed workers do not increase profits, but unemployment is profitable within the global capitalist system because unemployment lowers wages which are costs from the perspective of the owners. From this perspective low wages benefit the system by reducing economic rents. Yet, it does not benefit workers; according to Karl Marx, the workers (proletariat) work to benefit the bourgeoisie through their production of capital. Capitalist systems unfairly manipulate the market for labour by perpetuating unemployment which lowers laborers' demands for fair wages. Workers are pitted against

one another at the service of increasing profits for owners. As a result of the capitalist mode of production, Marx argued that workers experienced alienation and estrangement through their economic identity. According to Marx, the only way to permanently eliminate unemployment would be to abolish capitalism and the system of forced competition for wages and then shift to a socialist or communist economic system.

2.3 Empirical review.

Empirical review takes a look at previous findings on the subject matter in focus, it analyses the results and methodologies of previous findings on population growth, economic growth and unemployment and how well they have fared in explaining the phenomenon of population growth and it's impact on unemployment.some of these works considered are as follows:

The work of Nwosu, Dike and Okwara, (2014) which explored the role of population growth on economic growth in Nigeria. The study employed annual secondary data sources from 1960 to 2008. Empirical results support that population growth has a substantial impact on economic growth. The study also found that there is a sustainable long run equilibrium relationship between economic growth and population growth. There is also the evidence of one-directional cause between population growth and economic growth. Policy effects of the study are also provided.

Weing and Zimmerman (2012) used a Cobb-Douglas economy wide production function to analyse the impact of population growth on the steady rate of per capital income as

well as on economic growth in the transition to the steady state. They discovered that an increase in the population growth rate of 10% (e.g. 3% to 3.3%) would decrease per capital income in the steady rate by 5%. However, human capital is considered to be an additional factor of production, and then the negative effect of population growth is larger as population growth now forces economies to use their limited savings to equip young people as physical and human capital. As a result, 1% increase in population growth will decrease per capita income by 2%.

Adekola Paul, Allen, Olawale-Isaac, Akanbi and Adewumi (2016) conducted research on whether unemployment in Nigeria is predominantly determined by demographic change or if other innate causes are to blame for this societal problem. The population and unemployment structures of three positively selected and densely populated countries in three countries-Nigeria, China, and the United States-were compared. The findings reveal that population increase is not the sole factor driving population growth; however, in Nigeria, both population and unemployment are increasing.

Maijama, Musa, Yakubu and Mohammed (2019) examined the impact of population growth and unemployment in Nigeria. The research utilized an annual time series data from the period 1991 to 2017.The Dynamic Ordinary Least Square (DOLS) were used in the process of estimating the model. The main results discovered that population and exchange rate impacted positively with the unemployment. Government should focus

more on attracting foreign direct investment, increasing GDP per capita and the desired rate of consumer price index in order to control unemployment in the country.

Finally, Orumie, Ukamaka Cynthia (2016) study applied the multiple regression model whose estimation co integrate the negative relationship that exists between unemployment rate and gross domestic product considering population growth as well. The results estimated by the model developed in this research study revealed that since 1970, the rate of unemployment and population has been on the rise amidst a declining gross domestic product. The result also revealed that unemployment and population growth contributes commeasurably to gross domestic product. Furthermore, the result showed that unemployment contributes more to the national gross domestic product during this period in line with existing work.

2.4 Gap of the study.

Most studies carried out by various scholars have directed their focus towards population growth and economic growth, unemployment and economic growth, effect of population growth on economic development, relationship between growth, unemployment and employment in Nigeria.but from the works analysed so far there has been a lack of distinctive answer to the question of whether population growth is the cause of Unemployment in Nigeria?,even though their discoveries have shown that both of them keep rising at an increasing rate,in what way does the population growth in Nigeria affect the availability of jobs? Is it a direct relationship or is it an indirect

relationship? .although attempts have been made towards answering these questions; it has been overly vague in concisely explaining this relationship. It is on this foundation that this study attempts to cover this identified gap by empirically examining the relationship between rising population and unemployment in Nigeria for the period 1990-2020, specifically looking at its impact of some social-economic indicators and unemployment.

CHAPTER THREE

THEORETICAL FRAMEWORK AND MODEL SPECIFICATION

3.1 Theoretical Framework:

The research aims to unravel the relationship that exists between population growth and unemployment in Nigeria, with a focus on understanding how these variables have evolved over the past four decades. The theoretical framework for this study draws upon a key economic theory and concept which is:

3.1.1 The Malthusian Theory of Population:

Thomas Malthus opined that population tends to grow at a faster rate than the resources available to sustain it. In the context of Nigeria, this theory suggests that rapid population growth may strain the labor market, potentially leading to higher unemployment rates.Malthus made the gloomy prediction that in a short while as a result of this growing population, the nation's per capita GDP will fall overtime. Falling per capita GDP leads to higher rate of unemployment since the effect of savings and investment which are very critical to boost economic growth has been undermined due to an increasing population.

The implication of Malthus' model is that the real wages determined by the market would always come down to the subsistence level. Population would begin to grow if real wages were above that level, including a fall in nominal wages which resorts because firms now

have a larger supply of labour available. This could render some persons unemployed due to the fall in the nominal wage which is as a result of the rise or growth in the population.

The formula for the Malthus theorem is obtained from the concept of growth rate. As per the Malthusian Model specified by the various researchers, the basic formula of the Malthus theorem is as follows:

$W_t = f(N_t)$ bt = $g(W_t)$

Where W_t is the wage rate (at time t), is the size of the adult group (at time t) $N_t$and is the crude birth rate (at time t)b_t.

The functions specified in the formula play a crucial role, The function f(.) defines the wage/employment connection in the labor market as it relates to the region's economy, whereas the g(.) function specifies the impact of labor market reward on fertility in a specific location.

3.2 Model Specification:

3.2.1 Mathematical function: The specification of the model utilises the mathematical relationship between the dependent variable and the model‟s independent variable. To address the research questions and test the hypotheses derived from the theoretical framework, we propose the following model specifications:

Model 1: Evolution of Population Growth and Unemployment:

UNEM=f(POP) ……(3.1)

Where;

UNEMP=Unemployment

POP=Population Growth

Unemployment occurs due to a lack of sufficient jobs to commensurate with the growing population, even those who are currently employed live with the fear of becoming unemployed due to job insecurity, economic recession and retrenchment of workers. Unemployment in this function is the dependent variable as it depends on population growth to obtain its outcome. On the other hand, population growth is the independent variable. The equation reveals the presence of a functional relationship and explains that unemployment depends on the population growth.It therefore means that a change in the population growth rate will see a change also in the rate of unemployment. In the theoretical and empirical literature on the analysis of macroeconomic determinant of unemployment, some variables like population growth proxy as total population, EXG (Exports of goods and services), INR (Interest rate) and Inflation will be included.

$UNEMP= \beta_0+\ln\beta_1 POP+\ln\beta_2 EXC\_RATE+\ln\beta_3 GESCS+ Ut$ …… (3.2)

$\beta1>0$, $\beta2$ & $\beta3<0$

3.2.2 Description of variables

The econometric function variables represent:

POP=Population

UNEMP =Unemployment

EXC_RATE= Exchange rate.

GESCS=Government expenditure.

β_0- β_3=parameters.

The equation 2 above shows that unemployment is a function of population growth proxies such as total population, exchange rate, and government expenditure. It shows that unemployment depends on these variables and changes in these variables will either positively or negatively affect unemployment.

Ut is the stochastic or error term which will be used to capture other important variables not specified in the model.

3.3 ECONOMIC PROCEDURE

3..3.1 ECONOMIC CRITERIA (E C)

. It is expected that population growth should have a positive relationship with unemployment in the estimation model. This means that they should possess positive sign in the estimation. Because with the rising population although the factors of production keep increasing but that increase is not proportionate to the production and utilization of the resources.

3.3.2 STATISTICAL CRITERIA.

Here the following statistical test will be carried out.

R2: Determinant of coefficient. It is used in evaluating the goodness of fit. It range between zero and one (0 & 1). Thus thecloser the R2 is to one, the better the model.

F – Statistic: this will be used in evaluating the overallsignificant of the model. That is, if the independent variables are simulteouly significantThe Null hypothesis is stated as:

H0: $\beta 1 = \beta 2 = \beta 3 = 0$

Decision rule; reject H0 if F- cal / > / F- tab/. And conclude that the variables are simultaneously significant

t -statistic: this is used in evaluating the significance of the individual regressions or independent variables. Ho: B1 = 0

Where i =1……..5

Decision Rule: reject Ho if / t- Cal/ >/ t-tab/

3.3.3 ECONOMETRIC CRITERIA (EC)

This is the second – order statistical tests we are going to carry out. These tests include Auto correlation, multi- colinearity and Heterosecdasticity

(1) Auto- correlation: this is used in testing of the coefficient of the independent variables has been affected by the dependent variables. This measured using Durbin Watson (DW).

(2) Multi- co linearity: this is used in testing if a particular regressors has been affected by if interaction with other regressors or independent variables.

Decision rules: if any interaction shows co-linearity value in excess of 0.8. We conclude that there is a significant level of co-linearitybetween the two values.

(3) Heterosecdasticity: this is used in testing if the residual have equal variance i.e. Homoscedasticity the Null hypothesis is state thus.

H0: No HomoscedasticityDecision rule: reject H0 if X2 cal > X2 tab and conclude that homoscedasticity was achieved.

3.4 METHOD OF DATA ANALYSIS.

The Ordinary least squares method (OLS) is adopted to help minimize the error that occur during prediction, between estimate and the real values.The data (secondary data)will be gotten from the United Nations world population reports and the World Development Indicator (World Bank).

With the model above and to know the effect of population growth, Exchange Rate and Government expenditure on unemployment in Nigeria.

CHAPTER FOUR

DATA PRESENTATION ANALYSIS AND INTERPRETATION OF RESULT

4.1 Introduction

In this section, all the variables employed in this study are empirically tested, their parameters estimated, presented and results interpreted in line with economic theories as it relates to their policy implications. This section start with descriptive statistics, followed by the unit root test, Johansen co-integration test and then the long run and short run regression estimates of the models. Finally, the chapter ends with a summary of the results and its policy implications.

4.2 Descriptive Statistics and Graphical Exposition

The summary statistics of all the series employed in this study are presented and discussed below. Specifically, we have Measures of Central tendencies and Variability. The mean of each of the series is a pointer to the average of the respective variable. The standard deviation shows how distributed the variable is from the mean. The summary statistics are given in Table below.

Table 4.1: Descriptive statisticss results.

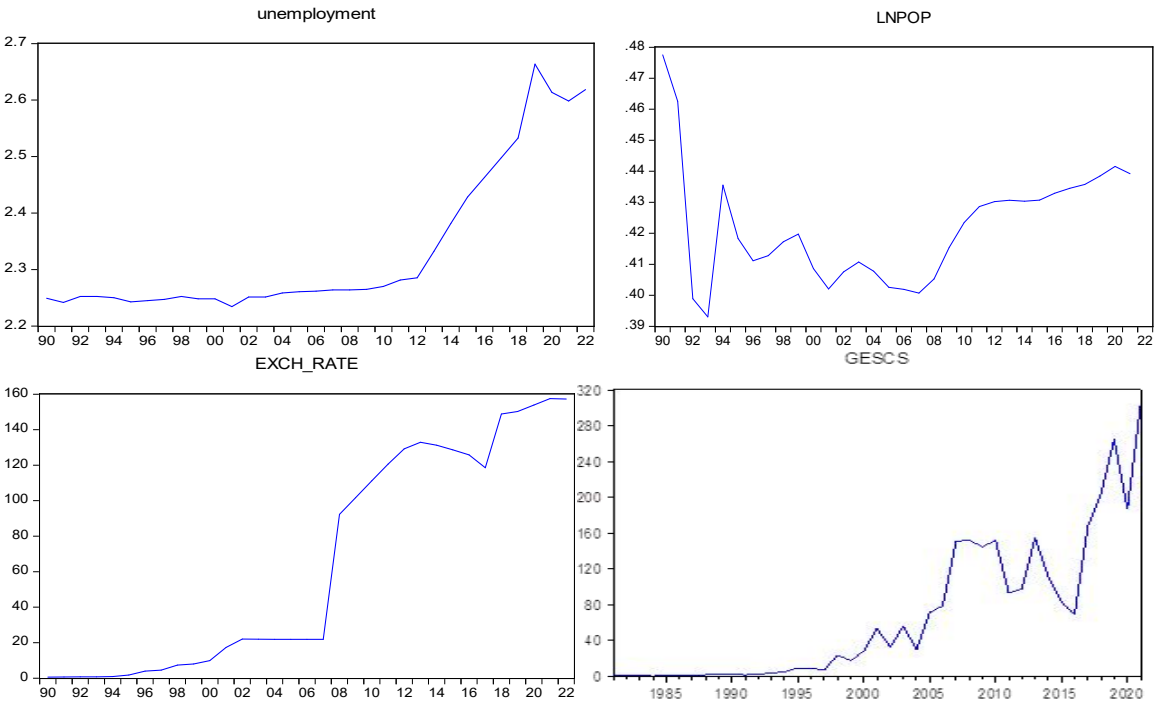
	LNUNEMPOY	LNPOP	EXCH_RATE	GESCS
Mean	0.364189	0.421499	59.14528	89.06858
Median	0.354247	0.418313	21.89526	71.36119
Maximum	0.425493	0.477554	153.8625	303.6626
Minimum	0.349143	0.393038	0.617708	1.491700
Std. Dev.	0.021205	0.018835	59.78818	81.19547
Skewness	1.692881	0.965578	0.394586	0.880832

Kurtosis	4.585093	4.058338	1.343499	3.073792
Jarque-Bera	18.05220	6.263867	4.348770	4.015667
Probability	0.000120	0.043633	0.113678	0.134279
Sum	11.28985	13.06648	1833.504	2761.126
Sum Sq. Dev.	0.013489	0.010643	107238.8	197781.1
Observations	31	31	31	31

Source: Author's computation using eviews 9.0

The table 4.1 above shows the mean values of LNUNEMLOY, LNPOP, EXCH_RATE, and GESCS to be 0.364189, 0.421499, 59.14528, and 89.06858 respectively. It also shows their standard deviation to be 0.021205, 0.018835, 59.78818, and 81.19547 depicting that all the mean of the variables fall between their minimum and maximum values. Moreover it also shows that all variables are positively skewed.

Graphical Trend of The Data Spread Overtime.



4.3 PRELIMINARY RESULTS

4.3.1 TEST FOR STATIONARITY/ UNIT ROOT TEST

THE AUGMENTED DICKEY FULLER TEST

This section investigates the time series variables' stationarity. Stationarity refers to refers to the fact that the statistical characteristics of time series (or, more precisely, the proves that generates it) do not change with time. Stationarity is important because many useful analytical techniques, statistical tests, and models rely on it. The table below

shows the stationarity and non-stationarity of the variables in these investigations as well as the order of integration.

AT LEVEL

TABLE 4.2

Variables	**ADF Test Statistics**	**Prob (At level) at 5 percent sig. level.**	**Order of Integration**	**Remarks**
UNEMPLOYMENT	1.77728	0.9973	I(0)	Not Stationary
LNPOP	-0.861031	0.7828	I(0)	Not Stationary
EXCH_RATE	-0.125994	0.9381	I(0)	Not Stationary
GESCS	-0.618235	0.9067	I(0)	Not Stationary

Source: Author's Computation Using Eviews 9.0

AT FIRST DIFFERENCE

Variables	**ADF Test Statistics**	**Prob (At level) at 5 percent sig. level.**	**Order of Integration**	**Remarks**
UNEMPLOYMENT	-4.867991	0.0004	I(1)	Stationary
LNPOP	-3.030725	0.0462	I(1)	Stationary
EXCH_RATE	-5.306888	0.0001	I(1)	Stationary
GESCS	-9.878703	0.0000	I(1)	Stationary

Source: Author's Computation Using Eviews 9.0

From the ADF results in table 4.2, non of the variables were stationary at level while all of them were stationary at first difference.

4.3.2 Cointegration Test

It is of importance that we analyse the possibility of having a co-integrating relationship amongst the variables of our study; this is in light of the diverse levels of stationarity of our variables, some at level and some at the first difference. To do this, Pesaran recommended using the ARDL bound cointegration test, and the results are shown below.

4.3.3: ARDL Bound Test

Table 4.3

Test Statistic	Value	k
F-statistic	18.12656	3
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.72	3.77
5%	3.23	4.35
2.5%	3.69	4.89
1%	4.29	5.61

Source: Author's computation using EVIEWS.

From the table 4.3 above,it is evident that the estimated F-statistic of the model surpassed the upper bound limit even at the 5% level of significance, the findings therefore represents a long term link between the variables in the model.

4.4 MODEL ESTIMATES.

SHORT RUN AND LONG RUN ESTIMATION

TABLE 4.4 Short run results.

Dependent variable: UNEMPLOYMENT.

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNUNEMPOY(-1))	-1.445651	0.248460	-5.818448	0.0001
D(LNPOP)	0.105912	0.117070	0.904692	0.3850
D(LNPOP(-1))	0.205927	0.084963	2.423714	0.0338
D(LNPOP(-2))	0.021555	0.056271	0.383066	0.7090
D(LNPOP(-3))	0.127631	0.054123	2.358164	0.0379
D(EXCH_RATE)	-0.000135	0.000045	-3.012093	0.0118
D(EXCH_RATE(-1))	0.000049	0.000040	1.241348	0.2403
D(EXCH_RATE(-2))	-0.000098	0.000042	-2.351883	0.0384
D(EXCH_RATE(-3))	-0.000202	0.000051	-4.003919	0.0021
D(GESCS)	-0.00010	0.000014	-7.148476	0.0000

	3			
D(GESCS(-1))	-0.000081	0.000023	-3.479210	0.0052
CointEq(-1)	0.325898	0.097639	3.337771	0.0066
Cointeq = LNUNEMPOY - (1.0398*LNPOP - 0.0004*EXCH_RATE + 0.0000				
*GESCS -0.0853)				

Source: Author's Computation Using Eviews 9.0

Discussion of Findings

The error correction term (ECM) which represents the speed of adjustment needed to restore equilibrium in the dynamic model after a disturbance appropriately explains the model as both its sign and significance level meets theoretical and statistical expectations. The implication of this is that a shock to UNEMPLOYMENT in the current period will be restored at a speed of adjustment of about 3.26% in the next period.. Thus, confirming the adequacy and statistically efficiency of the model.

The one period lag of UNEMPLOYMENT explains that one percent in previous period level of Unemployment will increase the current Unemployment by 14.4%. Howepver, this relationship is significant at the 5% level of significance for the one period lag but not significant even at the 10% level of significance.while population Current, and the 1,2 and 3 period lag explains that a percent increase in the current and three period lag will increase unemployment by 10.5%,20.5%, 2.1% and 12.7% respectively. They are all significant at the 5% level of significance. Exchange rate are all significant at the 5% level and a percent increase in exchange rate will have a effect of -0.01% in the current,

0.004% first lag,-0.0098%second lag and -0.02% third period lag on Unemployment. A one percent increase in D(GESCS) will decrease unemployment by 0.01% in the current period and by 0.008% in the 1st period lag. This is significant even at the 5% level.

Table 4.5

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNPOP	1.039756	0.270429	3.844837	0.0027
EXCH_RATE	-0.000403	0.000104	-3.865419	0.0026
GESCS	0.000017	0.000070	0.247353	0.8092
C	-0.085341	0.112117	-0.761177	0.4626

Source: Author's computation using eviews 9.0

Discussion of Findings

For the long run, only LNPOP significantly affects unemployment The coefficient of LNPOP at 1.039756 suggests that a one percent increase in LNPOP will increase unemployment by about 10.4% in the long run. This is significant at the 5% level of significance.

4.5 DIAGNOSTIC RESULTS

Table 4.6

R-	Adj R-	F-Stat	Prob(F-	DW	Ramsey	Breusch-	Breusch-	Jarque-Bera

squared	squared		Stat)	Stat	RESET F.(Prob)	Pagan-Godfrey F.(Prob)	Godfrey F.(Prob)	Prob.
0.996980	0.992862	242.0886	0.000000	2.943863	0.2333	0.9000	0.1647	0.0001

The R-squared value of 0.996980 indicates that approximately 99.6% of the variation in the dependent variable (LNUNEMPLOY)) can be explained by the model's set of explanatory variables (LNPOP,EXCH_RATE and GESCS) the adjusted R-squared however takes into consideration the loss of degrees of freedom suggests that the explanatory variable of the model accounts for about 99.2% of the changes in the dependent variable.There is little to no strong evidence of autocorrelation in the model residuals, as indicated by the Breusch-Godfrey F-probability value of 0.1647 (its greater than the 0.05 threshold for rejecting the null hypothesis of serial correlation) although the D.W stat is showing 2.9,but the Breusch-Godfrey test is more accepted (reliable).

With a p-value of 0.2333 the Ramsey RESET test concludes that the model does not suffer from omitted variable bias. This indicates that the existing regressors of the model provide a satisfactory explanation for the changes in the dependent variable. With a p-value of 0.9000 the Breusch-Pagan-Godfrey test indicates that there is no statistically significant evidence of heteroscedasticity in the model residuals. This suggests that the residuals' variance is stable across the range of measured values.Jarque-Bera p-value of

over 0.0001 suggests that the residuals are normally distributed. This implies that the model's normalcy assumptions are not seriously affected. Finally, the Prob(F-Stat) value of 0.00000 indicates the goodness of fit of the entire model.

4.6 Policy implications

The findings of the study show that in the short run, population significantly impacts Unemployment in Nigeria in the model and it was positive and significant. This result is in conformity with the works Malthusian theory of population growth which this study is based on, In the long, population is significant and positively related to Unemployment in the nation, that's as the population of the country grows the Unemployment rate will expand as well with it., which is also in line with Malthus theory of population for the first model, while for real gross domestic product population is positively related to RGDP and highly significant,that's as the population increase it might lead to economy improvement in the long run.

CHAPTER FIVE

SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

5.1 Introduction

This section entails summary of the findings of the analyses carried out in the previous section. Based on these findings, recommendations are given for policy implementation. Afterwards, the entire project is concluded.

5.2: Summary of findings

This study investigates the long run and short run relationship between the impact of population growths on Unemployment in Nigeria from 1990 to 2020. Results of the analysis revealed that all the explanatory variables of the model explained unemployment to a large degree in the short run. However in the Long run, only population significantly affects unemployment. In the short run, population captured in the model was positive and significant.

The sign and statistical significance of the speed of adjustment represented by the coefficient of the ECM and seen as the converging force between the long and short run models were appropriate and in conformity with a priori and statistical expectations in all the models of the study.

5.3 Policy recommendations.

1. Government should ensure the promotion sustainable development goals which seeks to meet the needs of the present without compromising the ability of future generations to meet their own needs. By promoting sustainable development, the government can help to create a more livable and condusive environment for all Nigerians and reduce the pressure on resources. The government can promote sustainable development through policies that protect the environment, conserve resources, and promote economic development that is equitable and sustainable.

2. Address poverty and inequality which are two of the main causes of high fertility rates in country. By addressing these issues, the government can help to reduce population growth through job creation programs, social safety nets, and investments in basic services such as health and education.

3. Government should Invest in education and enlightening programs that stresses the importance of good family planning. This will help citizens to make informed decisions about their family size and spacing. The government can provide free or subsidized access to family planning services, such as contraceptives and counseling. The government can also invest in education programs to equip their citizens to be innovative and be self employed.

4. Women empowerment as they are often the primary decision-makers in Nigeria households. By empowering women, the government can help to reduce fertility rates. The government can give women a greater role to play in the society through education

programs, economic and legal reforms. It generally improves the Outlook of the society, rather than relegating them to just household duties of just child birth and taking care of their kids. A society with more empowered women will result in a reduced population yet the productivity and innovation would be better generally solving the issue of unemployment.

5.4 Conclusion

Using annual time series data from 1990 to 2020, this study examined the long and short-run effect of population on unemployment. . Extensive reviews of diverse literatures and existing works on the impact of population were undertaken, The study is based on the Malthus theory of population.The study utilized a regression model. The independent variables were population, exchange rate and Government expenditures. The dependent variable is unemployment The descriptive analyses of the variables were carried out, with its summary values interpreted.Augmented dickey fuller (ADF) test was used in checking for stationarity among the variables. Moreover, the Autoregressive Distributed Lag Model was used as the technique of analysis. The ARDL Bounds Test was conducted to ascertain the existence of a long run relationship among the variables employed. The long run and short run models were thereafter estimated, and its results interpreted. The results obtained suggests that all the explanatory variables of the model were significant to a large extent in explaining unemployment in the short run. While in the long run, only population growth significantly affected unemployment.

Finally, the study issued recommendations and measures that should be put in place to control population as it affects Unemployment and the economy at large.

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Appendix

Descriptive statisticss

	LNUNEMPOY	LNPOP	EXCH_RATE	GESCS
Mean	0.364189	0.421499	59.14528	89.06858
Median	0.354247	0.418313	21.89526	71.36119
Maximum	0.425493	0.477554	153.8625	303.6626
Minimum	0.349143	0.393038	0.617708	1.491700
Std. Dev.	0.021205	0.018835	59.78818	81.19547
Skewness	1.692881	0.965578	0.394586	0.880832
Kurtosis	4.585093	4.058338	1.343499	3.073792
Jarque-Bera	18.05220	6.263867	4.348770	4.015667
Probability	0.000120	0.043633	0.113678	0.134279
Sum	11.28985	13.06648	1833.504	2761.126
Sum Sq. Dev.	0.013489	0.010643	107238.8	197781.1
Observations	31	31	31	31

johansen cointegration.

Date: 10/07/23 Time: 03:03		
Sample (adjusted): 1992 2020		

Included observations: 29 after adjustments				
Trend assumption: Linear deterministic trend				
Series: LNUNEMPOY LNPOP EXCH_RATE GESCS				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.889865	113.9263	47.85613	0.0000
At most 1 *	0.561262	49.95082	29.79707	0.0001
At most 2 *	0.538545	26.05908	15.49471	0.0009
At most 3	0.117695	3.631296	3.841466	0.0567
Trace test indicates 3 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.889865	63.97549	27.58434	0.0000
At most 1 *	0.561262	23.89175	21.13162	0.0199
At most 2 *	0.538545	22.42778	14.26460	0.0021
At most 3	0.117695	3.631296	3.841466	0.0567

R squared

R-squared	0.996980	Mean dependent var	0.365999
Adjusted R-squared	0.992862	S.D. dependent var	0.022189
S.E. of regression	0.001875	Akaike info criterion	-9.4334

			79
Sum squared resid	3.87E-05	Schwarz criterion	-8.665576
Log likelihood	143.3520	Hannan-Quinn criter.	-9.205141
F-statistic	242.0886	Durbin-Watson stat	2.943863
Prob(F-statistic)	0.000000		

Long and shorrt run

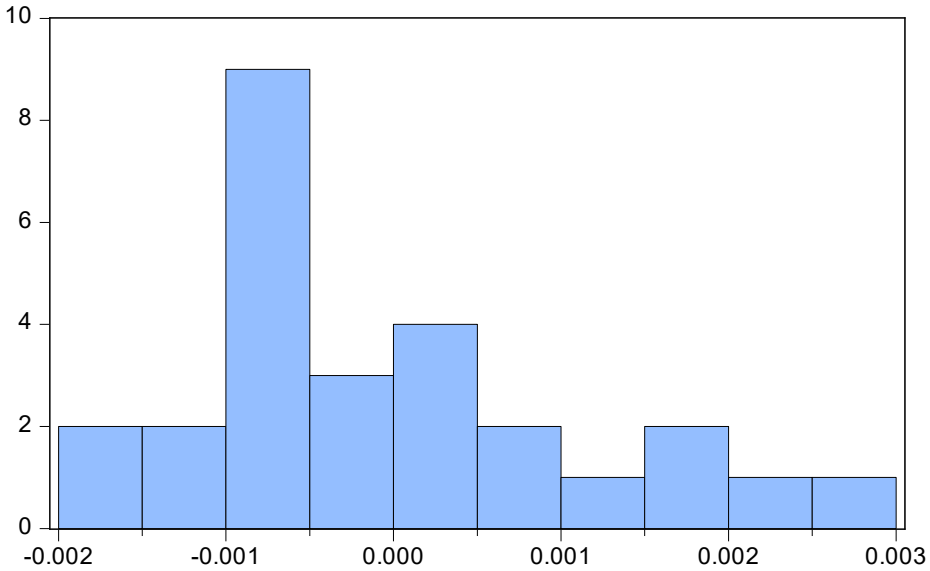
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNUNEMPOY(-1))	-1.445651	0.248460	-5.818448	0.0001
D(LNPOP)	0.105912	0.117070	0.904692	0.3850
D(LNPOP(-1))	0.205927	0.084963	2.423714	0.0338
D(LNPOP(-2))	0.021555	0.056271	0.383066	0.7090
D(LNPOP(-3))	0.127631	0.054123	2.358164	0.0379
D(EXCH_RATE)	-0.000135	0.000045	-3.012093	0.0118
D(EXCH_RATE(-1))	0.000049	0.000040	1.241348	0.2403
D(EXCH_RATE(-2))	-0.000098	0.000042	-2.351883	0.0384
D(EXCH_RATE(-3))	-0.000202	0.000051	-4.003919	0.0021
D(GESCS)	-0.000103	0.000014	-7.148476	0.0000
D(GESCS(-1))	-0.00008	0.000023	-3.479210	0.0052

	1			
CointEq(-1)	0.325898	0.097639	3.337771	0.0066
Cointeq = LNUNEMPOY - (1.0398*LNPOP - 0.0004*EXCH_RATE + 0.0000 *GESCS -0.0853)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNPOP	1.039756	0.270429	3.844837	0.0027
EXCH_RATE	-0.000403	0.000104	-3.865419	0.0026
GESCS	0.000017	0.000070	0.247353	0.8092
C	-0.085341	0.112117	-0.761177	0.4626

Bound test

ARDL Bounds Test				
Date: 10/07/23 Time: 03:09				
Sample: 1994 2020				
Included observations: 27				
Null Hypothesis: No long-run relationships exist				
Test Statistic	Value	k		
F-statistic	18.12656	3		
Critical Value Bounds				
Significance	I0 Bound	I1 Bound		

10%	2.72	3.77		
5%	3.23	4.35		
2.5%	3.69	4.89		
1%	4.29	5.61		



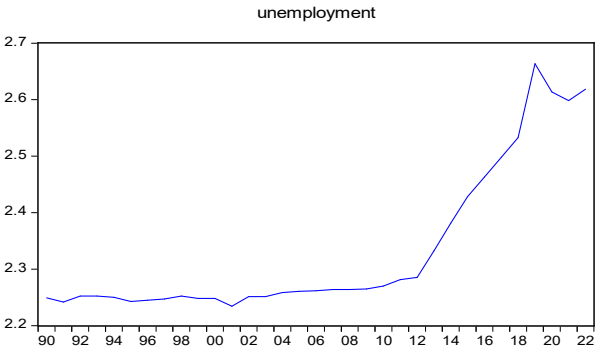
Series: Residuals
Sample 1994 2020
Observations 27

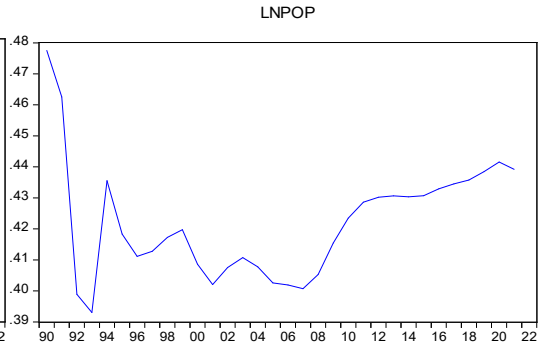
Mean	2.45e-16
Median	-0.000438
Maximum	0.002891
Minimum	-0.001850
Std. Dev.	0.001219
Skewness	0.731457
Kurtosis	2.850538
Jarque-Bera	2.432763
Probability	0.296300

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	2.218757	Prob. F(2,9)	0.1647
Obs*R-squared	8.916299	Prob. Chi-Square(2)	0.0116

Heteroscedasticity test Breusch-Pagan-Godfrey			
F-statistic	0.491064	Prob. F(15,11)	0.9000
Obs*R-squared	10.82878	Prob. Chi-Square(15)	0.7646
Scaled explained SS	1.451120	Prob. Chi-square(15)	0.10000

Ramsey RESET Test				
Equation: UNTITLED				
Specification: LNUNEMPOY LNUNEMPOY(-1) LNUNEMPOY(-2) LNPOP				
LNPOP(-1) LNPOP(-2) LNPOP(-3) LNPOP(-4) EXCH_RATE				
EXCH_RATE(-1) EXCH_RATE(-2) EXCH_RATE(-3) EXCH_RATE(-4)				
GESCS GESCS(-1) GESCS(-2) C				
Omitted Variables: Squares of fitted values				
	Value	df	Probability	
t-statistic	1.268692	10	0.2333	
F-statistic	1.609580	(1, 10)	0.2333	


unemployment
2.7
2.6
2.5
2.4
2.3
2.2
90 92 94 96 98 00 02 04 06 08 10 12 14 16 18 20 22


LNPOP
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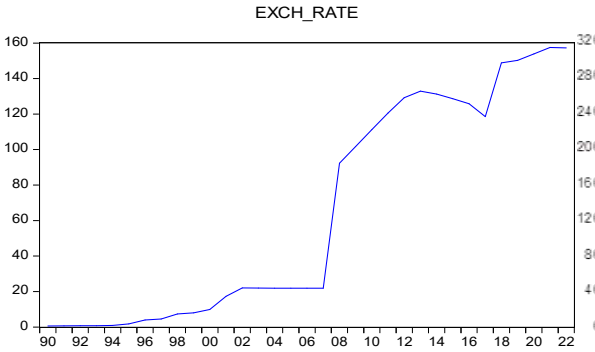
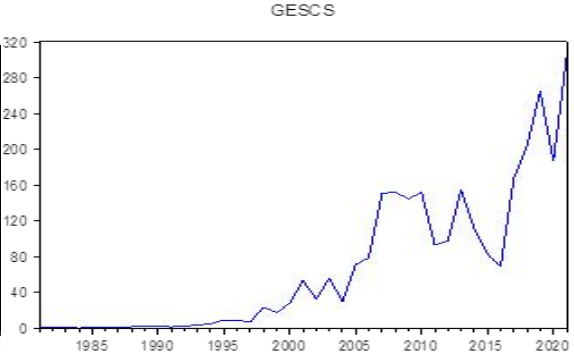
.47
.46
.45
.44
.43
.42
.41
.40
.39
90 92 94 96 98 00 02 04 06 08 10 12 14 16 18 20 22


EXCH_RATE
160
140
120
100
80
60
40
20
0
90 92 94 96 98 00 02 04 06 08 10 12 14 16 18 20 22


GESCS
320
280
240
200
160
120
80
40
0
1985 1990 1995 2000 2005 2010 2015 2020