NON-PARAMETRIC ANALYSIS ON THE RATE OF UNEMPLOYEMENT IN NIGERIA

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A PROJECT SUBMITTED TO THE DEPARTMENT OF STATISTICS, FACULTY OF PHYSICAL SCIENCES, UNIVERSITY OF BENIN IN P ARTIAL FULFILLMENT THE BACHELOR OF SCIENCE (B.SC) DEGREE IN STATISTICS

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CERTIFICATION

We certify that this work was done by VIVIAN OGHENEVWHEREH TOWEH (MISS) of the Department Of Statistics University Of Benin, Benin City, Edo State, Nigeria.

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UNDERTAKING

This project was Carried out by VIVIAN OGHENEVWHEREH TOWEH (MISS) Matriculation Number **PSC1909291**. I have neither copied nor duplicated the works of any other author(s). All works used have duly been cities and acknowledged.

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Signature/Date

DEDICATION

This project work is dedicated to God Almighty the source of knowledge who has been my strength and who make it possible for me to complete my project work successfully despite all odds. And my parents Mr and Mrs Toweh for their love and support towards this academic pursuit.

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ABSTRACT

This research work examined the rate of unemployment in Nigeria. The data used was a secondary data obtained from World Bank on twenty -three observations. The research studied the relationship between unemployment rate and population growth in Nigeria using the chi square analysis, it also examined the impact of inflation, population growth and unemployment rate on GDP using the kruskal Wallis analysis. The Analysis shows that unemployment does not depend on population growth and also population growth and unemployment rate show a significant effect on GDP while inflation does not exhibit statistically significant relationship in the analysis, and unemployment rate show an increasing trend. Based on the outcome of the research it was recommended that government should support and provide incentives for entrepreneurship, encouraging others to start businesses and create job opportunities for others.

CHAPTER ONE

INTRODUCTION

1.0 BACKGROUND OF THE STUDY

There should be more concern expressed about unemployment in the Nigerian economy. It still stands as the government's primary macroeconomic goal.

A number of major developmental issues are brought on by unemployment, which is becoming a bigger issue throughout Nigeria.

The primary goal of internal government agencies' and the government's policies is to lower the unemployment rate. Unemployment has been a defining feature of developing nations ever since the population explosion began.

Unemployment is, in fact, the forced inactivity of wage earners who are willing and able to work but are unable to find employment. Lack of employment is a major issue in societies where the majority of people can only make a living by working for others.

According to Alanna (2003), unemployment poses a risk because it sends mixed signals to all facets of Nigerian society. Even during times of economic normalcy, such as the oil boom of the 1970s (6.2%), 1980s (9.8%), and 1990s (11.5%), Nigeria has a high rate of youth unemployment. One of the main issues Nigeria is currently facing is unemployment. Studies have indicated that joblessness has been steadily increasing and is still unstable in all economies, particularly in developing nations. Importantly the increasing rate of poverty, homelessness, crime, frustration, social vices, and political problems aroused the interest of unemployment as a macroeconomic issue.

The amount of economically active people who are unemployed but available for and seeking work, including those who have lost their jobs as well as those who are willing to quit their

occupations, is defined as unemployment, according to Word Bank (1998). The alarming unemployment rate in Nigeria in recent times has been a great concern to economists, policy makers, economic managers, individuals, government and many others Bello (2003).

The National Bureau of Statistics (NBS) estimates that 33.3% of Nigerians are unemployed in 2020.

There are two types of unemployment: involuntary and voluntary. In the sense that someone chooses not to work because they have other sources of income, it is voluntary. The decline in the country's output, the rise in rural-urban migration, the wastage of human resources, the high dependency ratio, and other socioeconomic effects are all caused by unemployment. The social impact of unemployment highlights the necessity of suggesting potential remedies to save Nigeria.

Okonkwo (2005) identified three factors that contribute to unemployment in Africa: inadequate attention to agriculture, labour- or capital-intensive technology choices, and the educational system.

1.1 STATEMENT OF THE PROBLEM

Nigeria has struggled with unemployment for a very long time, and there is still no long-term solution in place.

Since many young people lack the skills necessary to obtain employment in the formal sector, unemployment has been attributed to a general lack of skill. The high rate of population growth is creating a large labour pool, the majority of which is unskilled.

In situations where employment is scarce, graduates hardly meet the requirements for employment because employers require years of experience prior to hiring (Alanna, 2003).

The economic recession of the 1980s, the emergence of the Naira exchange rate, and the incapacity of most industries to import raw materials necessary to maintain their output levels all contributed to the problem of unemployment. One significant effect of the Naira's sharp depreciation and the general price level rise was a reduction in aggregate demand and a weakening of wage earners' purchasing power.

Nigeria's unemployment issue should be of the utmost national concern as it has grown chronic and unmanageable. In Nigeria, the issue of concealed unemployment is very serious. This explains the stark differences between official unemployment figures and available unofficial or true employment statistics. The number of people who are genuinely willing to work at the current set of wage rates is substantially understated by the officially recorded unemployment rate. High rates of inflation and unemployment have been plaguing Nigeria in part due to ineffective policy implementation and ongoing tensions between these two crucial macroeconomic factors. The recent increase in unemployment among professionals, including bankers, doctors, and engineers, has made the situation worse. The cost is borne by the productive population in Nigeria. Because Nigeria's labour market is characterised by a high rate of unemployment and underemployment, a sizable public sector, low wages, and unfavourable working conditions, these issues have been one of the main issues facing the country's economy. which, taken together, have created less than amicable working relationships in the formal labour market. As several national development plans have stated, the legitimate national goals of Nigeria's successive governments have always been to promote gainful employment and curb the country's rising rates of unemployment in both rural and urban areas. The promotion of formal employment, through job creation in the public sector and, to some extent, in the private sector

as well, has been the strategy adopted for the realisation of these objectives. Consequently, there hasn't been much focus on self-employment or entrepreneurial schemes.

1.2 AIM AND OBJECTIVES

Aim: To analyze the rate of unemployment in Nigeria, using chi-square and Kruskal-Wallis tests.

Objectives:

1. Determine the association between unemployment rate and population growth in Nigeria using chi square analysis
2. Examine the impact of inflation, population growth, unemployment rate on GDP in Nigeria using the kruskal Wallis analysis.
3. Identify any significant patterns or trends in unemployment rate in Nigeria.
4. Provide recommendations for policy interventions or targeted initiatives aimed at addressing unemployment challenges in Nigeria based on the insights.

By pursuing these objectives, we aim to enhance understanding the rate of unemployment in Nigeria and inform evidence-based policy decisions to promote sustainable economic development and reduce unemployment rates.

1.3 SIGNIFICANCE OF THE STUDY

Realising full employment is one of any nation's macroeconomic objectives. As a result, unemployment is viewed as a failure of policy in any system, and it is crucial that the government limits its effects on the economy.

For politicians, students, and policy makers alike, studying unemployment is essential. Knowing the current level of unemployment within the system gives policymakers the best opportunity to

reduce it through the development of awareness campaigns and other initiatives like skill development and poverty eradication.

The study will be important to students as it brings an insight to the rate of unemployment in the country and also encourages them to learn skills that would make them self-employed rather than depending solely on the government.

1.4 SCOPE AND LIMITATIONS

Scope: The study will employ a non-parametric statistical method to analyze the rate of unemployment in Nigeria from 2000-2022. The study will explore the implications of non-parametric findings for policy makers, providing insight into potential interventions to address unemployment challenges in Nigeria.

Limitations: The study may encounter the following limitations;

1. Data availability: The availability and quality of data on unemployment in Nigeria may vary across different regions and time periods, potentially limiting the scope and accuracy of the analysis.

2. Sampling Bias: The study's findings may be influenced by sampling biases inherent in the data collection process, particularly if certain demographic groups or regions are underrepresented in the sample.

3. Contextual Factors: The study may not fully account for contextual factors such as government policies, economic fluctuations, and socio-cultural dynamics that influence unemployment rates in Nigeria.

4. Generalizability: Findings from the study may have limited generalizability beyond the specific time period and geographical context of Nigeria, cautioning against extrapolating conclusions to other regions or time periods without due consideration.

5. Model Complexity: The complexity of non-parametric models used in the study could pose challenges in interpretation and generalization. While these models capture intricate patterns in the data, their complexity may hinder straightforward interpretation and limit their applicability beyond the specific context of the study.

Addressing these limitations requires a balanced approach, including rigorous data collection, careful consideration of sampling biases, cautious interpretation of findings, acknowledgment of contextual factors, and humility in generalizing conclusions. Despite these limitations, the study contributes valuable insights into understanding unemployment dynamics in Nigeria and provides a foundation for further research and policymaking efforts in addressing this pressing socio-economic challenge.

1.5 DEFINITION OF TERMS

1. Non-parametric Analysis: A statistical approach that doesn't rely on assumptions about the underlying distribution of data. It's useful when data doesn't meet the criteria for parametric tests like normality.

2. Unemployment Rate: The percentage of people in the workforce who are actively seeking employment but are unable to find jobs. It's a key indicator of economic health and labor market dynamics.

3. Chi-Square Test: A statistical test that determines whether two categorical variables have a significant relationship or not. It aids in our comprehension of whether unemployment status and other variables, such as population growth, are related.

4. Kruskal-Wallis Test: A statistical test used to compare the median ranks of three or more independent groups.

5. Hypothesis Testing: A statistical method used to make inferences about population parameters based on sample data. It helps determine if observed differences in unemployment rates or associations between variables are statistically significant or just due to chance.

6. Categorical variables: Categorical variables, also known as qualitative variables, are types of variables that represent categories or groups and have distinct, non-ordered values. These variables are used to classify individuals or items into specific groups based on shared characteristics or attributes.

7. Nigeria: Nigeria underwent periods of military rule, democratic transitions, and political instability after gaining independence from British colonial rule in 1960. With 36 states and a Federal Capital Territory, each with its own government, the nation is a federal republic. Nigeria's economy benefits greatly from its abundance of natural resources, which include coal, oil, natural gas, and minerals. However, the country faces challenges such as poverty, corruption, inadequate infrastructure, and security concerns, particularly in regions affected by insurgency and ethnic conflicts. Despite these challenges, Nigeria has a diverse and vibrant cultural heritage, with over 250 ethnic groups, each with its own languages, traditions, and customs. The country is known for its music, literature, cuisine, and festivals, reflecting the cultural diversity and resilience of its people.

CHAPTER TWO

LITERATURE REVIEW

A review of some unemployment-related literature is given in this chapter. It provides an explanation of unemployment in Nigeria, including its definition, types, causes, and effects.

2.0 EMPIRICAL LITERATURE

Every country's economy is characterised by both an active and an inactive population, according to Anyadike et al. (2012). They noted that people who are willing and able to work, such as those who are employed or actively involved in the production of goods and services, are the economically active members of society.

Bassey and Atan (2012) opined that the structural Adjustment Programme (SAP) had a salutary effect on job creation leading to a sharp fall in unemployment from 7.1% in 1987 to 3% in 1994. However the rate of unemployment in Nigeria kept on increasing.

Bello (2003) examined the issue of unemployment in sub-Saharan Africa, paying particular attention to what happened in Nigeria. After identifying the nature of this episode in the Sahara, the study reveals several factors that contribute to this phenomenon. The economy is undoubtedly the biggest threat. An evaluation of Nigeria's anti-employment policy measures from the past and present reveals a number of non-economic and economic factors impeding their effectiveness.

According to Dike(2009) the quality of education and technological capability in the manufacture of capital goods and research and development of a nature are pointers to the effectiveness, efficiency and productivity of its industrial sector . Nigeria has been unable to acquire advanced technological capability. This gave rise to unemployment.

Volkova (1986) maintained that the unemployment situation is in other words called mass-unemployment when the number of qualified manpower who are unemployed is considerably enough to outnumber those who are gainfully employed.

A growing population indicates a greater availability of labour. Over a 16-year period (1991-2006), with a population growth of (88,992,220,140,003,542) at 36.4 percent and an economy growing at 55.5 percent, unemployment should have decreased significantly, but instead it increased by 74.8 percent. However, between 1995 and 2011, the oil sector's average contribution to the GDP was 26.7 percent; in contrast, agriculture, which provides the majority of the nation's gainful employment, contributed 39.3 percent, a difference of only 12.6 percent from that of the oil sector, which employs less than 10 percent of the labour force. In 1995, agriculture contributed 34.1 percent to the GDP and 43.5 percent in 2011; this represents an increase of 9.4 percent with this sector employing over 50 percent of labor in the country, there should have been a decrease in the rate of unemployment but rather the rate of unemployment increased by 69 percent (CBN, 2012). This can be linked to the important industries that have been neglected, like agriculture, where the nation has a comparative advantage. The nation's inadequate infrastructure, which hindered the country's rapid industrialization, the blatant mismanagement of national resources that resulted in wasteful spending and the misappropriation of funds and priorities, and the lack of political will to enact certain policies that could have allowed the private sector to participate in the Nigerian economy are some of the other factors contributing to this abnormal situation. One such example is the government's reluctance to fully deregulate the oil and gas industry's downstream sector. According to Bello (2003) another cause is the weak educational system that is not adequate to equip youths with requisite technical and entrepreneurial skills.

Yelwa, et al. (2015) examined the connection between Nigeria's economic growth, inflation, and unemployment. The Ordinary Least Squares (OLS) method was employed in the study to examine the relationship between unemployment, inflation, and economic growth using secondary data. The findings demonstrate that unemployment and inflation have the opposite effects on Nigerian growth. One explanation for the potential inverse relationship between inflation and price level is that disruptions in the supply chain of goods, originating from both domestic and foreign sources, could be the cause of inflation rather than pressure from aggregate demand. Nonetheless, there is a causal relationship in Nigeria between unemployment, inflation, and economic growth. They therefore advise that, in order to create a sustainable and supportive environment that will support an increase in domestic output, the government must either improve or keep refining macroeconomic policy tools.

Chukwuma (2014) examined Nigeria's terrible unemployment rate. Between 2000 and 2011, information was gathered from secondary sources, and the chi-square test and simple regression analysis were used for analysis. According to the study, the unemployment rate is rising and is independent of age, gender, or educational attainment.

Ademola and Badiru (2016) use secondary data on real gross domestic product, unemployment, and inflation rate for the years 1981–2014 to study and ascertain the effects of these variables on economic performance in Nigeria. The Johansen Juselius test for co-integration was used to establish a co-integration relationship between the variables, and the OLS result demonstrates a positive relationship between economic growth and the rates of unemployment and inflation. They advised the government to implement a programme that would sharply cut back on imports while promoting domestic industry growth through local production and consumption. Doing so would boost output and lower unemployment and inflation in Nigeria.

The study conducted by Oduro and Aryee (2003) investigates the impact of unemployment on the GDP of Nigeria over a nine-year period spanning from 2000 to 2008. Regression analysis was used to show that unemployment has a significant impact (more than 65 percent) on the GDP of Nigeria and that there is an inverse relationship between the two variables—a rise in unemployment causes a fall in GDP and vice versa.

Nigerian urban unemployment is examined by Berthod and Grundler (2013). The variables for are as follows: population, inflation, gross capital formation, nominal wage rate, level of unemployment, and supply and demand for labour. The study found that the main cause of high unemployment in Nigeria appears to be rising nominal wages and accelerated population growth, which affected the supply side by creating a large and rapid labour force increase relative to the economy's absorptive capacity. This was determined using time series secondary data and a parsimonious error correction mechanism.

John and Bright (2012) investigate the connection between youth unemployment and poverty in Nigeria. The study used secondary data from 1987 to 2011 on the incidence of poverty as a function of population, inflation rate, real GDP contributions from manufacturing, agriculture, and services, unemployment, and growth rate analysis using ordinary least squares. The findings showed that the population, real GDP contributions from agriculture and services, and unemployment all positively determine the degree of poverty in Nigeria, with the exception of the agricultural sector, which is statistically insignificant. Only the manufacturing sector appeared significant, and the real GDP contribution and inflation rate showed a negative relationship with Nigeria's poverty level. The report suggested, among other things, that governments at all levels make a comprehensive effort to reduce unemployment and create jobs.

In his research, Orumie (2016) used multiple regression models, whose estimation co-integrates the inverse relationship between the GDP and unemployment rate while also taking population growth into account. Consequently, this offers a chance to evaluate additional factors that influence economic growth, like population growth in this instance. The population and unemployment rates have been rising since 1970, while the GDP has been decreasing, according to data derived from the time model used in this study. The outcome also shows that population expansion and unemployment have a huge impact on the GDP. Additionally, in accordance with previous research, the result demonstrated that unemployment makes up a larger portion of the national gross domestic product during this time.

Obasanmi and Akinrogunde (2022) noted that between 1981 and 2020, low employment rates and economic growth were causally related in Nigeria. The causal relationship between Nigeria's low employment rate and economic upturn was examined using the error correction method. The results showed that there is a consistent relationship between Nigeria's economic recovery and its low employment rate. In the short and long terms, there was a significant inverse correlation between Nigeria's economic growth and the low employment rate. Furthermore, the Granger causality analysis results showed a unidirectional causal relationship between Nigeria's economic growth and unemployment.

2.1 CONCEPT OF UNEMPLOYMENT

When people who are willing and able to work cannot find suitable employment opportunities, they are said to be unemployed. Unemployment in Nigeria is a multifaceted socio-economic challenge that has significant implications for individuals, families, communities, and the nation as a whole. This discussion will explore the concept of unemployment in Nigeria, including its

causes, consequences, trends, and potential solutions, drawing on relevant research, data, and analysis.Unemployment in Nigeria has been a persistent issue, with fluctuating rates over the years. According to data from the Nigerian National Bureau of Statistics (NBS), the unemployment rate in Nigeria stood at 33.3% in the fourth quarter of 2020, representing a significant increase from previous years. Youth unemployment, in particular, remains a pressing concern, with rates disproportionately higher among young people aged 15 to 34.Youth unemployment is a significant subset of the overall unemployment challenge in Nigeria. Factors contributing to youth unemployment include limited access to education and skills development opportunities, mismatch between educational qualifications and job requirements, and barriers to entrepreneurship and self-employment. The lack of job opportunities for young people not only hampers their economic prospects but also undermines social stability and development.The COVID-19 pandemic has exacerbated unemployment challenges in Nigeria, leading to widespread job losses, business closures, and economic disruptions. Lockdown measures, restrictions on movement, and supply chain disruptions have disproportionately affected certain sectors such as hospitality, tourism, retail, and informal trade, resulting in mass layoffs and income losses for workers. The pandemic has highlighted the need for resilient and inclusive economic policies and social safety nets to mitigate the impact of future crises on employment and livelihoods. A significant portion of employment in Nigeria is found in the informal sector, which consists of unregulated, small-scale economic activities such as street vending, artisanal work, and household enterprises. While the informal sector provides livelihoods for many Nigerians, it is characterized by low wages, limited job security, and lack of social protections. Informal sector workers often face precarious working conditions and have limited access to formal employment benefits such as healthcare, pensions, and social security.

When someone is ready, able, and available for work—that is, actively looking for work—but they do not have a job, it is sad for them to be unemployed. The number of persons who fit that description is the number of unemployed people in an economy. The percentage of the labour force that is unemployed in an economy is known as the unemployment rate. The sum of all employed individuals and all unemployed persons in the 18–60 age range is known as the total labour force.

2.2 TYPES OF UNEMPLOYMENT IN NIGERIA

In Nigeria there are various types of unemployment

1. Structural unemployment: This kind of unemployment results from economic structural shifts that make certain workers unfit because their skill sets don't align with the demands of the labour market. Except the worker(s) acquire the necessary skills, they remain unemployed for considerably long time. Structural unemployment could also results from persistent cyclical unemployment, that is, if the economy suffers from long term low aggregate demand and in the techniques of the industry, unemployment could occur (Udu and Agu,2005).
2. Frictional unemployment: frictional unemployment is a type of unemployment that results from moving between jobs, at any given time in an economy. Such movement usually involves some temporary displacement from the former job. In general, getting information on better job opportunities, going through the process of application through taking on appointments, has its associated cost. And quite often, this may include temporary unemployment. Udu and Agu (2005) asserted that, there is frictional

unemployment when certain occupations have surplus workers in one part of the country, while vacancies for similar jobs occur and are not filled in other parts of the country.

3. Seasonal unemployment; This type of unemployment occurs due to variations in demand for labor during different seasons, affecting certain industries workers in agriculture experience unemployment during off season. According to Udu and Agu (2005) seasonal unemployment occurs mostly in the industrial sector, and in the enterprise that are seasonal in nature. Such activities engage labor temporarily during peak periods. For example, during the rainy season, many men who are engaged in fishing and building may go out of work during bad weather. Fishing, for instance, is not usually done during the rainy season in many parts of Nigeria. Moreover, during the Christmas season, shop owners and companies employ extra hands for the seasonal sales. These extra hands are usually relieved of their jobs when demand for products decreases.
4. Transitional unemployment; Udu and Agu (2005) refer to this as normal unemployment, because it is short duration. It does not harm the economy. In construction industries or contract jobs which rely heavily on manual labor, workers are temporarily laid off at the end of major assignments. Such workers are re-engaged when other jobs become available. Others may drift to other ongoing projects.

2.3 CAUSES OF UNEMPLOYMENT IN NIGERIA

1. Corruption: To the average Nigerian, the word corruption is not foreign. It is, in a nutshell, dishonest or unlawful behaviour, particularly by those in positions of authority. It is the misuse of public office for personal benefit, typically entailing the falsification of data and facts, nepotism, and embezzlement of public funds. It has caused poverty in the midst of plenty, weakened democratic institutions, and slowed economic growth and development (Samuel, 2011). It has impeded Nigeria's advancement in politics, society, and the economy, leading to high rates of widespread unemployment in the country.
2. Neglect of the agricultural sector: Agriculture continued to be the backbone of the Nigerian economy up until the early 1970s. More than 90% of the population works in this industry and receives their daily income from it, making it the main source of income for the nation and the biggest employer of labour. Following the 1970s oil boom and subsequent spike in oil prices, the agricultural sector experienced a significant decline that continues to this day. Large amounts of money from the oil industry have fueled the expansion of both public and private businesses, most of which are based in urban areas.Later, this led to a migration of able-bodied men from rural areas to urban centres, where they took menial jobs that are sporadic and scarce. These men were farmers.
3. Inadequate management techniques: Nigerians are renowned for having a poor management mindset. The nation has an abundance of natural resources at its disposal. It's thought that Nigeria can overcome its high unemployment rate and related issues if its resources are fully developed, well-harnessed, and well-managed. Managing the country's economy entails evaluating current resources and distributing them among rival industries in order to achieve specific objectives.Nigeria is not short of sound economic

strategies. The right kind of implementation is what's missing. The failure result of corrupt and incompetent implementers has taken over the implementation process.

4. The lack of economic diversification; Nigeria's reliance on crude oil as its primary source of income and economic foundation has been a factor in the country's high unemployment rate. Nigeria aligned itself with a single economy, as opposed to diversifying into several economic ventures. Nigeria has persisted in making the serious error of neglecting the agricultural sector. Before the discovery of crude oil, the agricultural sector employed the majority of labourers, but it was utterly disregarded. Recall that prior to the discovery of oil in Nigeria, the country was a federating one, with each of its constituent regions having its primary economic source.Nigeria's economy is still largely dependent on oil exports, which makes it susceptible to changes in the price of oil around the world. Restrictions on job creation and economic resilience stem from a lack of diversification into other industries, such as manufacturing, services, and agriculture.
5. Population growth: With a high fertility rate and a sizable youth population, Nigeria has one of the fastest-growing populations in the world. Because job creation efforts are not keeping up with the rapid population growth, there is a labour surplus compared to available employment opportunities, which exacerbates the unemployment situation. The number of young people who are actively seeking employment has increased as a result of the population's ongoing growth.

2.4 EFFECT OF UNEMPLOYMENT IN NIGERIA

In Nigeria, unemployment has far-reaching consequences on the economy, society, and well-being of the individual. The political and socioeconomic ramifications are enormous. These ramifications are divided into social, economic, and political categories for clarity.

1. Economic effects; An economy with high unemployment is not using all of the resources, specifically labor available to it. Since it is operating below its production possibility frontier, High unemployment rates indicate the underutilization of labor resources, leading to a decrease in overall productivity and economic output. Unemployment dampens consumer spending, investment, and entrepreneurial activities, thereby hindering economic growth and development. Unemployment exacerbates poverty levels as unemployed individuals and their families face financial hardships and struggle to meet basic needs. Unemployment strains government finances due to decreased tax revenues and increased spending on social welfare programs, unemployment benefits, and job creation initiatives. Reduced tax revenues limit the government's ability to invest in infrastructure, education, healthcare, and other essential services, further exacerbating socio-economic challenges.
2. Social effects; High unemployment rates contribute to social discontent, frustration, and disillusionment, particularly among youth who face limited job prospects and economic opportunities. Social unrest, protests, and civil disturbances may arise as a result of perceived injustices, inequality, and dissatisfaction with government policies Unemployment is associated with higher crime rates as individuals, especially young people, may resort to illegal activities such as theft, drug trafficking, and robbery to survive. Increased crime rates undermine public safety, social cohesion, and investment climate, further exacerbating economic challenges and hindering development efforts.

3. Political effects; one of the major implications of high unemployment to a country like Nigeria with wide spread corruption and bad governance, is palpable, increasing apathy, Many people become increasingly individualistic and exclusively preoccupied with the problem of survival and subsistence. They show little or no concern for government issues, activities and policies and programmes. Persistent unemployment can fuel political instability, social unrest, and undermine trust in government institutions.

CHAPTER THREE

METHODOLOGY

3.0 INTRODUCTION

This research explores non parametric statistics on the rate of unemployment in Nigeria. This report explores our chosen methodology, discussing data collection techniques and analytical methods used for reliable insights. We aim to analyze the rate of unemployment in Nigeria using non-parametric statistical tests, specifically the Chi-square and Kruskal-Wallis tests. The data used was a secondary data collected from World Bank on 23 observations.

3.1 THE CHI-SQUARE TEST

A non-parametric statistical test called the chi-square test is used to assess if two categorical variables in a dataset significantly correlate with one another. It aids in determining whether there are notable deviations between the observed data distribution and the expected distribution. This test is frequently used to evaluate correlations between variables and draw conclusions about their interdependence in a variety of fields, including biology, the social sciences, and market research. The most well-known of several chi-squared tests ($\chi 2$), which are statistical processes whose outcomes are assessed in light of the chi-squared distribution, is Pearson's chi-squared test. Karl Pearson conducted the first investigation into its properties in 1900. Names like Pearson X-squared test or statistic are used in situations where it's critical to distinguish between the test statistic and its distribution. It investigates a null hypothesis that claims a specific theoretical distribution is consistent with the frequency distribution of specific events seen in a sample. The events under consideration should have a total probability of one (1) and

be mutually exclusive (Gupta and Kapoor, 2000). This frequently occurs when each event relates to a categorical variable's result.

3.1.2 CHI-SQUARE STATISTICS

$$\chi 2 = \sum_{i=1}^{n} \frac{(O_i - E_i)^2}{E_i}$$

$\chi 2$ = Pearson's cumulative test statistic, which asymptotically approaches a $\chi 2$ distribution.

.Oi = an observed frequency

Ei = an expected (theoretical) frequency

n=the no of cells in the table

A chi-square distribution with a predetermined number of degrees of freedom is followed by the chi-square statistic. The test establishes whether the observed association between the variables is statistically significant by comparing the computed chi-square statistic to the critical value from the chi-square distribution (or by computing the p-value associated with the chi-square statistic).The test rejects the null hypothesis of independence and finds a significant association between the variables if the p-value is less than a predefined significance level (at 0.05). Many different fields make extensive use of the Pearson chi-square test.

The chi-square goodness-of-fit test, also called the Pearson chi-square test, evaluates the degree of independence between two categorical variables in a contingency table. This statistical test looks for a meaningful relationship or association between the observed frequencies of the categorical variables and the expected frequencies based on the assumption of independence.

This research would be on chi square test for independence as we wish to test on unemployment rate and population growth.

3.1.3 ASSUMPTION OF CHI SQUARE TEST

1. Independence of Observations: The observations used in the chi-square test should be independent of each other. In other words, the frequency counts or data points for each category should not be influenced by or dependent on the values of other observations.
2. Random Sampling: The data should be obtained through random sampling from the population of interest. Random sampling helps ensure that the sample is representative of the population and reduces the likelihood of bias in the results.
3. Sample Size: The chi-square test tends to perform better with larger sample sizes. As the sample size increases, the test becomes more reliable and robust, yielding more accurate results.
4. Categorical Variables: The variables being analyzed must be categorical, meaning they consist of distinct categories or groups with no inherent ordering.
5. Expected Cell Frequencies: Each contingency table cell's expected frequencies shouldn't be too tiny. A widely used guideline states that all cells should have expected frequencies greater than 1 and that no more than 20% of cells should have expected frequencies lower than 5.

3.1.4 CHI SQUARE TEST FOR INDEPENDENCE

The chi-square test for independence is a statistical test used to determine whether ther is a significant association between two categorical variables. It determines if there is a statistically significant difference between the observed frequencies of the variables in a contingency table and the frequencies that would be predicted if the variables were independent of one another.

The test statistic is:

$$\chi 2 = \sum_{i=1}^{r} \quad \sum_{j=1}^{c} \quad \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

The test calculates the expected frequencies for each cell in the contingency table under the assumption that the variables are independent. These expected frequencies are based on the marginal totals (row and column totals) of the table. The degrees of freedom in the chi-square test for independence depend on the dimensions of the contingency table and are calculated as (r - 1) *(c - 1), where r is the number of rows and c is the number of columns in the table. The chi-square statistic follows a chi-square distribution with a specific number of degrees of freedom. By comparing the computed chi-square statistic to the critical value from the chi-square distribution or by calculating the p-value associated with the chi-square statistic, the test determines whether the observed association between the variables is statistically significant.

If the p-value is less than a predetermined significance level (set at 0.05), the test rejects the null hypothesis of independence and concludes that there is a significant association between the variables. In test of independence the null and alternative hypothesis are given by;

H0: There is no association between the two variables and there are independent of each other

H1: There is a significant association between the variables, and they are dependent on each other.

3.1.5 THE CONTINGENCY TABLE

A contingency table, also known as a cross-tabulation table or crosstab, is a matrix that displays the frequency counts or proportions of observations for each combination of categories of two categorical variables. It is a fundamental tool for visualizing and analyzing the relationship between two categorical variables. Contingency tables allow you to visually examine the relationship between the two categorical variables by comparing the distribution of observations across different categories. They are particularly useful for identifying patterns, trends, and

associations between variables. There are different types of contingency table the easiest of them is the 2×2 contingency table the test statistic is given by:

$$\chi 2 = \frac{(ad-bc)^2(a+b+c+d)}{(a+b)(c+d)(b+d)(a+c)}$$

3.1.6 CRAMMERS V

Cramér's V, named after the Swedish mathematician Harald Cramér, is a measure of association or correlation between two categorical variables in a contingency table. It is similar to Pearson's correlation coefficient for continuous variables but is applicable to categorical data. Cramér's V ranges from 0 to 1, where 0 indicates no association between the variables, and 1 indicates a perfect association.

The formula is:

$$V = \sqrt{\frac{X^2}{(n)(r-1,c-1)}}$$

Where

$\chi 2$ =is the chi-square statistic from the chi-square test of independence.

n is the observations in the contingency table

r is the no of rows in the contingency table

C is the number of columns

Interpreting Cramér's V:

Values close to 0 suggest little or no association between the variables.

Values closer to 1 indicate a stronger association between the variables.

Cramér's V adjusts the chi-square statistic for the size of the contingency table, providing a standardized measure of association that is independent of sample size. It quantifies the strength and direction of the association between two categorical variables, with larger values indicating stronger associations.

3.1.7 THE PEARSON CONTINGENCY COEFFICIENT

Pearson's contingency coefficient measures the strength of association by comparing the observed chi-square statistic to the maximum possible chi-square value given the sample size. It provides a standardized measure of association that is independent of sample size and can be interpreted like the Cramer's v;

Values close to 0 suggest little or no association between the variables

Values closer to 1 indicate strong association.

The formula is:

$$C = \sqrt{\frac{X^2}{X^2+n}}$$

Where

$\chi 2$ is the chi-square statistic from the chi-square test of independence.

n is the total number of observations in the contingency table

3.2 KRUSKAL WALLIS TEST

The Kruskal-Wallis Test bears the names of the two individuals who jointly developed it in 1952: Kruskal and Wallis. When the ANOVA assumptions are not satisfied, the Kruskal-Wallis test—a non-parametric, distribution-free test—is employed. With three or more groups, they both use a grouping independent variable to test for significant differences on a continuous dependent variable.We assume that each group's distribution is normally distributed and that the variance of each group's scores is roughly equal for the purposes of the ANOVA. None of these presumptions apply to the Kruskal-Wallis Test, though. Similar to all non-parametric tests, the ANOVA has greater statistical power than the Kruskal-Wallis Test. The Kruskal-Wallis test is appropriate for non-parametric data because it does not require that the data be regularly distributed.

The test assumes that the observations within each group are independent and that the measurement scale of the dependent variable is ordinal or continuous. The hypothesis is given by:

H0 states: there are no significant differences between the medians of the group

H1:states that there is at least one group with a different median from the others.

The Kruskal-Wallis test ranks all the observations from all groups together, regardless of their group membership. Ties are handled by assigning the average rank to tied values. The test statistic (H) is calculated based on the ranked data and is similar to the ANOVA F-statistic. It measures the degree of difference between the group medians relative to the variation within groups.The formula for the test statistic involves summing the squared ranks for each group and adjusting for sample sizes and ties.

The Kruskal-Wallis test follows a chi-square distribution with $k-1$ degrees of freedom, where k is the number of groups. By comparing the computed test statistic to the critical value from the

chi-square distribution (or by calculating the p-value associated with the test statistic), the test determines whether the observed differences between groups are statistically significant.

Procedures for wallis test

1. Formulate Hypothesis: Declare the null hypothesis (H0) to be true: The group medians do not differ significantly from one another. Describe the alternative hypothesis (H1) as follows: The median of at least one group differs from that of the others.
2. Collect Data: Obtain data from two or more independent groups, where the dependent variable is ordinal or continuous but does not meet the assumptions of normality required for parametric tests.
3. Rank the Data: Combine all the data from the different groups and rank them collectively, regardless of group membership. Assign ranks based on the ordering of the observations, with ties handled by assigning average ranks.
4. Calculate the Test Statistic (H): calculate the sum of the ranks for each groups.calculate the test statistic using the formula

   $H=\frac{12}{N(N+1)}\sum \quad \frac{R_i^2}{n_i} - 3(N+1)$

   N is the number of observations

   R_i sum of the ranks of group I

   n_i is the sample size of group i
5. Determine the degree of freedom for the k-1 where k is the number of groups.
6. Compare Test Statistic to Critical Value: Look up the critical value for the chi-square distribution with the appropriate degrees of freedom (df) and chosen significance level

(0.05). Alternatively, calculate the p-value associated with the test statistic using statistical software or chi-square distribution tables.

7. Make a Decision: Reject the null hypothesis if the computed test statistic is higher than the critical value (or if the p-value is lower than the selected significance level).Reject the null hypothesis if the computed test statistic is not greater than the critical value (or if the p-value is greater than the selected significance level).

3.2.1 ASSUMPTIONS OF KRUSKAL WALLIS TEST

1. Independence: The observations within each group must be independent of each other. This means that the data points should not be influenced by or dependent on the values of other observations.

2. Ordinal or Continuous Data: The dependent variable must be measured on an ordinal or continuous scale. While the Kruskal-Wallis test is robust to violations of normality, it still requires that the dependent variable be measured on a scale that preserves the order or ranking of the observations.

3. Homogeneity of Variance: The variances of the dependent variable should be roughly equal across all groups. While the Kruskal-Wallis test is less sensitive to heteroscedasticity (unequal variances) compared to ANOVA, extreme differences in variances between groups may affect the accuracy of the test results.

4. Random Sampling: The data should be obtained through random sampling from the population of interest. Random sampling helps ensure that the sample is representative of the population and reduces the likelihood of bias in the results.

CHAPTER 4

DATA ANALYSIS

4.0 INTRODUCTION

Using the Statistical Package for Social Sciences (SPSS) software version 20, the study will be analysed and interpreted in this chapter, following the methodology outlined in the preceding chapter.

ANALYSIS PRESENTATION

1. **Determine the association between Unemployment rate and population growth in Nigeria using Chi-square test**

Result of Test of Independence between unemployment rate and population growth

Hypothesis

H_0: unemployment rate and population growth are independent

H_1: unemployment rate and population growth are dependent

Table 4.1

	Value		Asymp. Sig. (2-sided)
Pearson Chi-Square	391.000	374	.262
Likelihood Ratio	125.366	374	1.000
Linear-by-Linear Association	18.974	1	.000
N of Valid Cases	23		

Significance level and Decision criteria

$\alpha = 0.05$, Reject H_o, if p-value ≤ 0.05.

Interpretation

Since, p-value is 0.262, and it is greater than the level of significance, we accept H_0 and conclude that unemployment rate does not depend on population growth.

Result of Test of dependency between unemployment and population growth

Table 4.2

		Value	Approx. Sig.
Nominal by Nominal	Phi	4.123	.262
	Cramer's V	1.000	.262
Number of Valid Cases		23	

Interpretation

Since the co-efficient value is 1.000 which is perfectly one(1), we say that the relationship between the variables is perfect.

2. **Examine the impact of inflation, population growth and unemployment rate on GDP using kruskal-wallis test**

   The variables are

   β_1= inflation rate

   β_2= population growth

   β_3= unemployment rate

Hypothesis

H_0: $\beta_1 = \beta_2 = \beta_3 = 0$ (inflation population growth and unemployement has no significant effect on GDP)

H_1: $\beta_i \neq 0$ (inflation population growth and unemployement rate has a significant effect on GDP)

Result of the Kruskal-wallis test

Table 4.3

	N	Mean Rank
Inflation Rate	23	37.6
Population Growth	23	34.29
Unemployment Rate	23	29.41

Result of the Kruskal-wallis test statistics

Table 4.4

	Inflation Rate	Population Growth	Unemployment Rate
Chi-Square	1.725	10.326	10.611
Df	2	2	2
Asymp. Sig.	.422	.006	.005

Significance level and Decision criteria

$\alpha = 0.05$, Reject H_0 if p-value ≤ 0.05

Interpretation

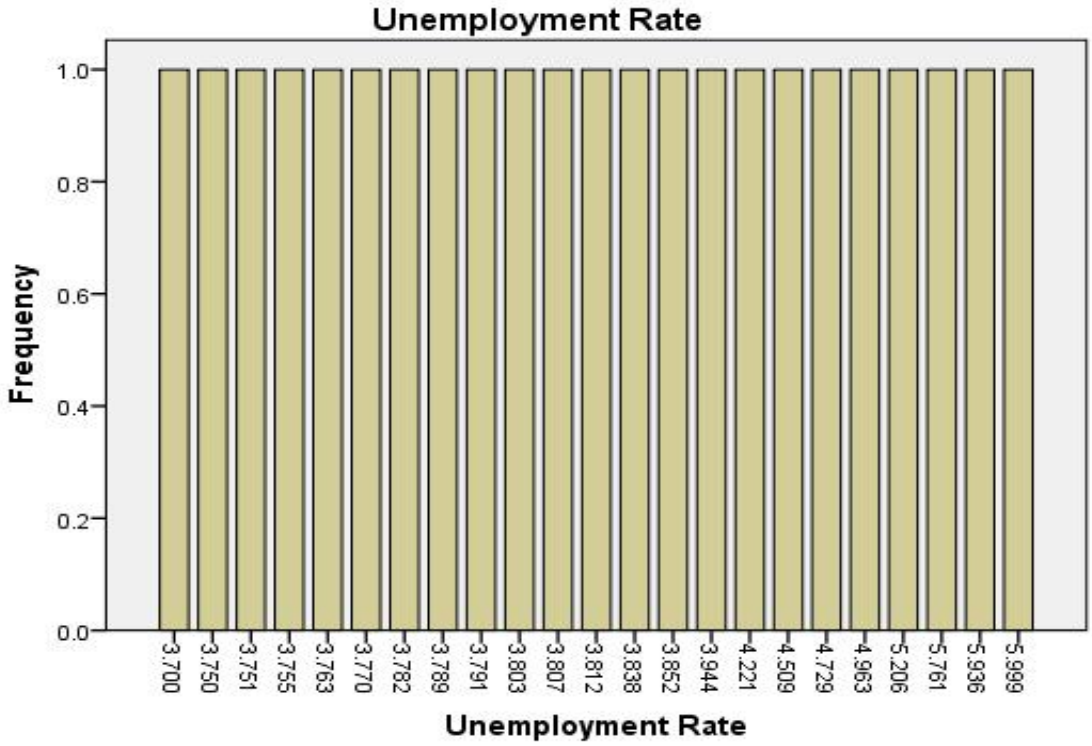
Population growth and unemployment rate show a significant effect on GDP while inflation does not exhibit statistically significant relationship in the analysis.

3. **Identify any significant patterns or trends in unemployment in Nigeria**

Unemployment Rate Table 4.5

Case	23
Mean	4.27091
Std. Deviation	.770488
Minimum	3.700
Maximum	5.999

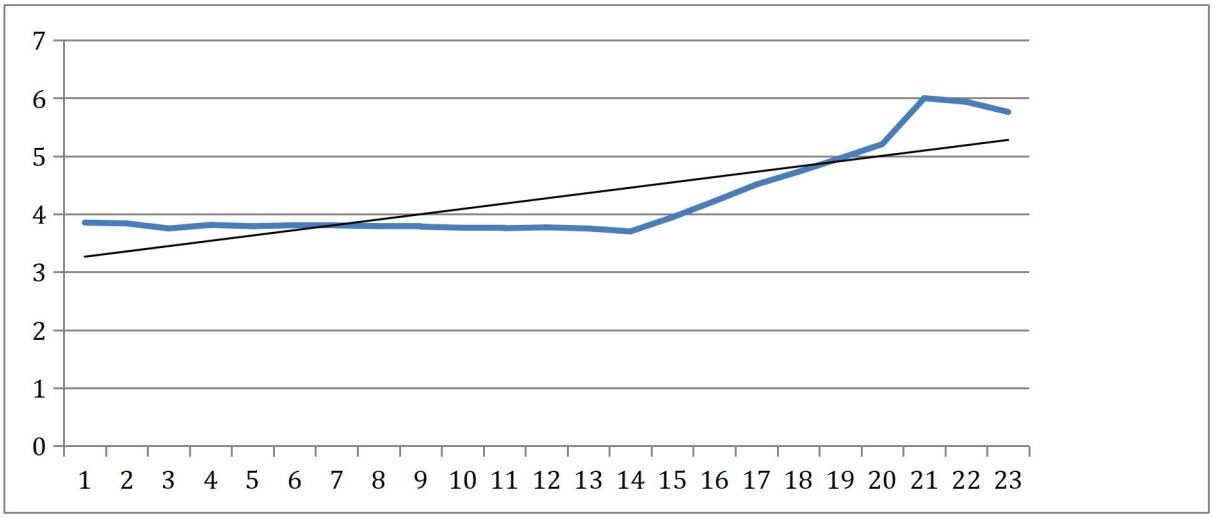
Figure 4.1



Interpretation

The descriptive statistics table above gives a summary of the mean, the deviation from the mean value (standard deviation), minimum, and maximum values for the unemployment variable. The frequency table 4.1 above, shows that for the 23 years studied (from 2000-2022), the occurrence was one (1), which means that over the years the unemployment rate varied.

Trend graph (Figure 4.2)



Interpretation

From Figure 4.2 above, the Y-axis represents the unemployment rate value, while the X-axis represents the years(2000-2022). An upward trend in the unemployment rate was observed. A linear trend line was fitted over the dataset to show this upward trend. This shows that over the years, there was an increase in unemployment rate in Nigeria.

CHAPTER FIVE

SUMMARY OF FINDINGS CONCLUSION AND RECOMMENDATIONS

This chapter summarizes the findings of this project work and the conclusions recommendations were also made for the government for targeted incentives aimed at addressing unemployment challenges in Nigeria.

5.0 SUMMARY OF FINDINGS

The study was carried out to evaluate the rate of unemployment in Nigeria using non-parametric statistics. A total of 23 observations were used and the data used was secondary data. Based on the data collected and analyzed for the study,chi square analysis was used to check the relationship between unemployment rate and population growth in Nigeria. The kruskal Wallis test was used to examine the impact of inflation , population growth and unemployment on GDP. The following are our major findings.

- Unemployment rate has no significant effect on population growth. Hence unemployment does not depend on the population.
- Inflation rate has no impact on GDP but unemployment rate and population growth has an impact hence GDP is dependent on unemployment rate and population growth.
- An upward trend in the unemployment rate was observed. This shows that over the years, there was an increase in unemployment rate in Nigeria.

5.1 RECOMMENDATIONS

1. Skills Development and Training: Invest in vocational training and education programs to equip individuals with the skills needed for available job opportunities, including digital skills for the modern workforce.

2. Entrepreneurship Support: Provide support and incentives for entrepreneurship, encouraging individuals to start their businesses and create job opportunities for others.
3. Infrastructure Development: Improve infrastructure such as transportation, energy, and telecommunications to attract investment, create jobs in construction and maintenance, and support business growth.
4. Diversification of Economy: Promote diversification of the economy beyond oil and gas, focusing on sectors like agriculture, manufacturing, technology, and services to create a more resilient job market.
5. Small and Medium Enterprises (SMEs) Support: Offer financial assistance, access to markets, and business development services to SMEs, which are significant contributors to employment in many economies.
6. Youth Empowerment: Develop programs targeting youth employment, including internships, apprenticeships, and mentorship opportunities, to facilitate their transition into the workforce.
7. Investment Climate: Create a conducive investment climate through regulatory reforms, ease of doing business initiatives, and incentives for both local and foreign investors, leading to job creation.
8. Data and Monitoring: Enhance data collection and monitoring systems to assess the effectiveness of employment policies and make informed decisions for continuous improvement.
9. Collaboration and Partnerships: Foster collaboration between government, private sector, academia, and civil society to leverage resources, expertise, and innovation in addressing unemployment challenges effectively.

5.2 CONCLUSION

This research work ascertained that unemployment rate does not depend on population growth from the results of the chi square test and inflation has no impact on GDP but population growth and unemployment rate has from the results of the kruskal Wallis test, there was an increase in unemployment rate in Nigeria. This research also recommend developing programs targeting youth employment, investment should be made on vocational training and education method to equip youth with skills for available job opportunities, encourage individuals to start their businesses and create job opportunities for others, diversify the economy beyond oil and gas to other sectors like agriculture, manufacturing, technology to create more resilient job market, provide support and incentives for entrepreneurship encouraging individuals to start their businesses.

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APPENDIX

Date	GDP(%)	Inflation Rate(%)
31/12/2000	5.0159	
31/12/2001	5.9177	
31/12/2002	15.3292	
31/12/2003	7.3472	
31/12/2004	9.2506	
31/12/2005	6.4385	
31/12/2006	6.0594	
31/12/2007	6.5911	
31/12/2008	6.7645	
31/12/2009	8.0369	
31/12/2010	8.0057	
31/12/2011	5.3079	
31/12/2012	4.2301	
31/12/2013	6.6713	
31/12/2014	6.3097	
31/12/2015	2.6527	
31/12/2016	-1.6169	
31/12/2017	0.8059	
31/12/2018	1.9228	
31/12/2019	2.2084	
31/12/2020	-1.7943	
31/12/2021	3.6472	
31/12/2022	3.2517	
6.9333		
18.8736		
12.8766		
14.0318		
14.998		
17.8635		
8.2252		
5.388		
11.5811		
12.5378		
13.7401		
10.8261		
12.2242		
8.4955		
8.0474		
9.0094		
15.6968		

16.5023
12.0951
11.3964
13.246
16.9528
18.8472

Population Growth	Unemployment Rate
2.64	
2.69	
2.72	
2.73	
2.73	
2.73	
2.73	
2.75	
2.76	
2.76	
2.78	
2.8	
2.79	
2.73	
2.66	
2.57	
2.54	
2.56	
2.53	
2.48	
2.47	
2.44	
2.41	
3.852	
3.838	
3.751	
3.812	
3.789	
3.807	
3.803	
3.791	
3.782	
3.763	
3.755	
3.77	
3.75	
3.7	
3.944	
4.221	
4.509	
4.729	

4.963
5.206
5.999
5.936
5.761