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PUBLIC EDUCATION EXPENDITURE AND UNEMPLOYMENT IN NIGERIA

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Abstract:
This study carefully examined the influence of public education expenditure on unemployment in Nigeria from 1980 to 2023. To achieve the above objective, data on unemployment rate, both capital and recurrent government spending on education, as well as inflation rate, were collected from the statistical bulletin of Nigeria's central bank. The Autoregressive Distributed Lag -ARDL method was used for analysis. The ARDL Bounds test showed there is a long-term connection between the above variables. The findings showed that in both the long and short term, government capital spending on education had a positive but not significant effect on unemployment in Nigeria. However, government recurrent spending on education had a negative and significant effect on unemployment. The inflation rate had a negative effect on unemployment in the long run and a positive effect in the short run. The study found that only the recurrent part of government spending on education has helped to reduce unemployment in Nigeria during the study period. Therefore, the government should ensure enough funding for the education sector and quickly implement fiscal responsibility laws to improve accountability and careful use of funds in the education sector. This will improve the quality of teaching, curriculum content, and learning facilities, which in turn will make students more competitive in the labour market, increase workers' productivity by equipping them with cognitive and technical skills required in modern economies, ensures graduates possess relevant capabilities demanded by employers, promotes innovation, creativity, and business creation capacities and helps produce job-ready graduates aligned with labour market needs.

Keywords: public expenditure, education, unemployment rate, UNESCO and ARDL

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1. Introduction

Globally, education is widely recognized as a critical catalyst for development and a fundamental enabler of socio-economic progress. The remarkable levels of development achieved by contemporary industrialized and emerging economies are largely attributed to their high levels of educational attainment. This recognition explains why investment in education consistently occupies a prominent position in national budgetary priorities across countries. The mechanisms through which education influences employment are multifaceted but clearly identifiable. Education promotes employment through several channels. In the area of self-employment, quality education equips individuals with the knowledge and skills required to establish and manage successful entrepreneurial ventures. Furthermore, basic education enhances individuals' trainability; without it, the ability to absorb further training and translate it into productive employment opportunities is significantly constrained.

In addition, education instills discipline of the mind and channels human effort toward productive pursuits. A disciplined mind is essential for productivity, and the role of productivity in wealth creation and poverty reduction cannot be overstated. Education also promotes lifelong employability by fostering the capacity for continuous learning. For instance, several decades ago, a large proportion of Nigerians were computer illiterate; however, the emergence of information and communication technology (ICT) has enabled individuals to develop digital literacy and relevant skills through learning and adaptation. These competencies, supported by internet access, have created numerous employment opportunities for those who possess them. Furthermore, quality education enhances critical thinking and creativity, making it indispensable for invention, innovation, discovery, and the expansion of knowledge. Virtually all major inventions of the modern era have been driven by educated minds. When education is broadly accessible, it becomes one of the most effective instruments for inclusive development. Consequently, education plays a pivotal role in reducing unemployment (Umo, 2012; Inimino, Tubotamuno, & Shaibu, 2017).

Furthermore, expenditure on the educational sector is expected improve the quality of teaching, curriculum content, and learning facilities, making students more competitive in the labour market. According to Todaro and Smith (2020), investment in education increases workers' productivity by equipping them with the cognitive and technical skills required in modern economies. In Nigeria, where skill mismatch significantly contributes to unemployment, improved educational quality ensures that graduates possess relevant capabilities demanded by employers (Adebayo & Anyanwu, 2022). Government expenditure on education is anticipated to enhance labour productivity, which stimulates economic growth and job creation. Endogenous growth theory highlights that education increases productivity and total output, thereby creating more job opportunities (Romer, 1990). By improving the skill base of the labour force, Nigeria can improve productivity in areas like information and communication technology, manufacturing, and services (Okafor, 2021). Spending on education encourages innovation and helps people start their own businesses. When the

government provides funding for universities, research centers, and technical schools, it promotes innovation, creativity, and business creation capacities (Acs et al., 2017).

According to Ogunyomi and Ojikutu (2021), increased funding for polytechnics and vocational centres will help produce graduates who are ready for jobs and match what employers need. When the government spends on education, it improves school buildings, labs, libraries, and digital tools, which help students learn better and make them more likely to get jobs (World Bank, 2020). Spending on education also lowers the number of students who drop out and helps more people join the workforce. Scholarships and subsidies make it easier for people to go to school and gain useful skills (Akinyemi & Abiodun, 2023). Money spent on education boosts jobs by increasing overall demand. Higher household incomes resulting from educational sector spending increase consumption and labour demand (Blanchard & Johnson, 2017). Government spending on education helps with job matching and sharing information about job markets, which reduces the time people spend looking for jobs (Idowu & Bello, 2020). Investing in education also helps shift the economy towards higher-skilled areas like information technology, manufacturing, and renewable energy (UNECA, 2021).

However, the Nigerian education system has not been effective in creating employment opportunities. Umo (2012), Abayomi (2012), and Ojewumi and Oladimeji (2016) say that the problem comes from a lack of funding in the education sector. This has caused a drop in the quality of education, too many schools opening without control, not matching what the job market needs with what is taught in schools, not enough money for research, and so on. The number of students per teacher is very high in primary and secondary schools, much higher than 40:1, and in universities, it is way above the 8:1 standard set by UNESCO. Also, there are not enough qualified teachers, especially in universities.

The costs of not providing enough money to the education system are very serious and cannot be ignored. In concrete terms, insufficient financing manifested in poor and dilapidated infrastructure, irregular payment of teachers' remuneration, inadequate staffing, and generally low salaries has contributed to recurring industrial actions by education sector unions, including the Academic Staff Union of Universities (ASUU), the Academic Staff Union of Polytechnics (ASUP), and the Non-Academic Staff Union of Universities. Such disruptions undermine the stability and effectiveness of the educational system and have far-reaching socio-economic implications. Specifically, they can lead to rising levels of illiteracy, a decline in workers' marginal productivity, particularly among unskilled labour and subsequently result in low real incomes, weak savings capacity, reduced investment, and diminished employment opportunities.

In 2015, the percentage of people who were unemployed in the labour force went up to 10.4 percent, which was higher than the 7.8 percent recorded in 2014. By 2016, the unemployment rate in the labour force rose to 14.2 percent (CBN, 2017; George-Anokwuru & Okowa, 2021). The total number of people in the labour force grew from 76.9 million at the end of December 2015 to 80.7 million by the end of December 2016, which is an increase of 4.9 percent. The unemployment rate went from 14.2 percent in the

fourth quarter of 2016 to 18.8 percent in the third quarter of 2017 (CBN, 2018; George-Anokwuru & Okowa, 2021).

Many studies have looked at how government spending on education affects unemployment in Nigeria. However, these studies have given different results. Some studies, like those by Mahdi and Shahid (2017), Ajenifuja (2019), Naseri and Shahrestani (2019), and Bampasidis and Sekeris (2020), found that education spending has a negative and strong link with the unemployment rate. But another study by Opuala-Charles and Oshilike (2023) found that government education spending has a weak, positive effect on unemployment. This difference in findings is worrying and raises an important question: What is the actual relationship between government education spending and unemployment in Nigeria? This paper aimed to answer that question because previous studies haven't kept up with the current situation of public education spending and unemployment in the country. This paper looked at how both government recurrent and capital education spending have influenced the unemployment rate in Nigeria from 1980 to 2023. The paper is divided into five parts: introduction, literature review, materials and methods, results and discussion, and conclusion and recommendations.

2. Literature Review

2.1 Conceptual Clarifications and Stylized Issues

Education has been described in many different ways by various experts. According to UNESCO (2000), education is the whole process of developing human abilities and behaviours. It is a planned and ongoing way of teaching that shares knowledge, skills, and values that are useful for all parts of life. Inimino, Tubotamuno, and Shaibu (2017) see education as a tool that can change society. It helps people gain the knowledge, skills, and abilities needed to be more productive, support economic growth, help with personal and social development, encourage creativity, support entrepreneurship and technological progress, and reduce social inequality. Ekpo (2017) believes education is about training people to be helpful to society as a whole, not just for their own benefit.

Strictly speaking, education is the process of acquiring quality knowledge and skills at all levels - primary, secondary, and tertiary through both formal and informal means. It is a lifetime process through which people are equipped to understand their environment and effectively utilize, manage, and transform it for their personal benefit and the advancement of society. Education also encompasses any process by which people gain knowledge, insight, and competencies, or develop intellectual and practical aptitudes. Through this process of acculturation, people are supported in realizing and developing their inherent potentials.

Moreover, Umo (2012) identified several ways through which education enhances employment opportunities. He argued that formal education is essential for paid employment, as the cognitive skills and certification requirements employers demand are largely acquired through structured educational systems. In addition, quality education equips individuals with the skills necessary for self-employment. Education also disciplines the mind, channels human effort toward productive activities, and

enhances individuals' trainability. Furthermore, it strengthens critical thinking and creativity, which are vital for adaptability, innovation, and sustained employability. Umo (2012) further conceptualized education as a form of generalized human capital, highlighting its strong linkages with technological advancement and innovation systems, both of which are central to contemporary economic development. Education occurs through both formal and informal channels, and any experience that shapes an individual's thinking, attitudes, or behavior can be regarded as educational. The processes of education encompass a variety of methods, including storytelling, discussion, teaching, training, and guided research.

Government expenditure on education refers to the financial commitment made by federal, state, and local governments toward the provision of educational services. It includes **r**ecurrent and capital expenditures. Recurrent expenditure on education includes wages and salaries of workers, purchases of stationery, instructional materials, fuel, electricity bills, etc. While **c**apital expenditure on education includes the construction and rehabilitation of school buildings, the provision of laboratories, libraries, ICT facilities, and other infrastructure. An adequate level of education spending enhances access, improves quality, expands enrollment, and ensures the development of relevant skills.

Interestingly, successive governments in Nigeria have made serious efforts in budgeting allocation to the educational sector. For example, in 2011, spending on education as a ratio of capital spending dropped to 3.9 per cent from 9.9 per cent the previous year (CBN, 2011). In 2013, early data showed that the social and community services sector made up 22.9 per cent of total recurring spending, with education and health together taking 67.6 per cent of that sector's total spending (CBN, 2013). Within the social and community services sector, education and health made up 43.9 per cent of the total money spent. As a ratio of capital spending, education spending fell to 3.2 per cent in 2013 from 5.4 per cent in the previous year. Overall government spending on main welfare areas showed that education spending increased by 7.5 per cent from 2012 levels to ₦425.8 billion, making up 8.2 per cent of the total spending (CBN, 2013).

In 2014, a classification of how money was spent on recurring expenses showed that spending on social and community services went down by 8.2%, reaching ₦774.8 billion, and made up 22.6% of the total. Education accounted for 44.4% of this spending (CBN, 2014). That same year, overall government spending on main welfare areas showed that education spending dropped by 8.7% from 2013, reaching ₦1,287.6 billion and making up 12.6% of the total spending (CBN, 2014). In 2015, the classification of recurring expenses showed that spending on social and community services rose by 4.2%, reaching ₦807.6 billion, and made up 21.1% of the total. Education made up 40.3% of this (CBN, 2015). In the same year, overall government spending on main welfare areas showed that spending on education and agriculture both went down by 22.1% (CBN, 2015).

In 2016, the amount spent on social and community services, which are part of recurring expenses, went down by 4.0 percent to ₦775.6 billion. This made up 18.6 percent of the total spending. Education was the biggest part of this, making up 43.7

percent (CBN, 2016). Also, in 2016, when looking at all the government spending on primary welfare areas, the money spent on education dropped by 16.2 percent, to ₦915.9 billion, compared to 2015 (CBN, 2016). In 2017, when looking at recurring expenses, education made up 42.8 percent of the total spending in the social and community services sector. Also, the money spent on capital projects for education in this sector was 35.1 percent of the total. Furthermore, when looking at government spending on primary welfare areas in 2017, education spending increased by 14.1 percent, reaching ₦1,155.8 billion from the 2016 level (CBN, 2017).

In 2018, a classification of recurrent spending showed that within the social and community services area, education made up 42.9 per cent of the total. Spending on education through capital funds was 35.8 per cent of the overall amount (CBN 2018). When looking at all spending of the government on main welfare areas, education spending increased by 11.0 per cent, reaching ₦1,299.9 billion in 2018 compared to the previous year (CBN, 2018). In 2019, the classification of recurrent spending showed that education accounted for 42.6 per cent of total spending in the social and community services sector. As a ratio of capital spending, education spending was 4.1 per cent, which was slightly less than the 4.3 per cent recorded in 2018 (CBN, 2019). In 2019, government spending on main welfare areas showed that education spending rose by 10.3 per cent, reaching ₦1,459.3 billion compared to 2018 levels (CBN, 2019).

From the above, it is clear that the funds allocated to the educational sector have not been sufficient. This has resulted in overcrowding in classrooms from primary schools to universities. It has also led to some unions holding strikes, including the Academic Staff Union of Universities (ASUU), the Academic Staff Union of Polytechnics (ASUP), and the Non-Academic Staff Union of Universities. This situation can make the rate of illiteracy in the country go up, reduce the productivity of workers, especially those without skills and can also cause lower real income, less savings, less investment, fewer jobs, and, as a result, lower capital formation. This is connected to the vicious circle theory, which tries to explain why some less developed countries stay underdeveloped. The theory says that there are certain limiting factors that are linked together in a way that it's hard, if not impossible, to break free from them. So, to escape this cycle, the government must take education seriously as an investment. Education helps build skills and abilities that are key to human development and improve the value of life. It brings many benefits to both individuals and society. Investing in education also gives very high returns in both social and economic terms. Government expenditure on education first affects unemployment through human capital development. Increased funding improves the quality of teaching, curriculum content, and learning facilities, making students more competitive in the labour market, which in turn will reduce unemployment.

Unemployment refers to the proportion of the labour force that is willing and able to work but cannot find employment. Nigeria experiences different forms of unemployment, including youth unemployment, graduate unemployment, underemployment and structural unemployment arising from skill mismatches. Persistent unemployment can undermine social stability, economic productivity, and national development.

In the 1960s and 1970s, the Nigerian economy offered a lot of jobs to the growing population. The wages paid in the country were quite good compared to other countries around the world. Most industries and some groups experienced peaceful working conditions during this time. When there was a big increase in oil production in the 1970s, many young people moved to cities looking for work. Gbosi (2015) said that the problem of unemployment in Nigeria began to show up after the economy started to slow down in the 1980s. According to CBN (2003), the national unemployment rate went up from 3.4 percent in 1970 to 6.4 percent in 1980. At the same time, CBN (2003) said that the high unemployment rate in 1980 was because of the slow period that Nigeria went through in the late 1970s.

Because of the economic problems, the government started a programme called the Structural Adjustment Programme (SAP). This programme caused the value of the naira to drop quickly and limited how much people could import. When the naira lost value fast, prices of most goods went up a lot. This made real wages go down. Lower wages meant people had less money to buy things, so overall spending dropped. As a result, factories ended up with more goods than they could sell. Since businesses act normally, they started laying off workers.

Because most Nigerian factories rely on imported goods, the ban on imports made it hard for companies to get the materials they need. This led many businesses to work less than they could, which made them unable to stay open. As a result, many companies had to shut down or cut back on their workers. In the government sector, an official ban on hiring was put in place starting in 1981, leading to a big number of job losses. In 1985, the country's overall unemployment rate was 6.1 percent, and it slightly dropped to 5.3 percent in 1986.

In 1987, the first year of the Structural Adjustment Programme (SAP), the unemployment rate went up to 7.0 percent. It reached 7.5 percent in 1992, then dropped to 7.2, 6.8, and 6.4 percent in 1993, 1994, and 1995. The rate went back up to 8.5 percent in 1997. In 1998, it fell to 7.6 percent, but then increased again to 8.5 and 11 percent in 1999 and 2000. The unemployment rate was 9.6 percent in 2001, 8.8 in 2002, 10.8 in 2003, and 10.2 in 2004 (Gbosi, 2015). According to the CBN (2003), the rise in unemployment was due to a fast-growing education sector, which led to more people entering the job market. However, the economy couldn't absorb all these new workers, making the unemployment problem worse in the country.

In 2005, 2006, and 2007, Nigeria's unemployment rate kept going up, reaching 9.4%, 9.9%, and 10.9%, respectively. The problem got worse in 2008, with the unemployment rate climbing to 12.8%. In 2009 and 2010, it was 11.2% and 11.5%, respectively. By 2011, the rate had risen to 14.6%. In 2012, 2013, and 2014, it was 12.4%, 12.8%, and 12.8%, respectively. In 2015, the number of unemployed people in the labor force went up to 10.4%, which was 2.6 percentage points higher than in 2014, when it was 7.8%. In 2016, the unemployment rate in the labor force went up to 14.2% (CBN, 2017). The total number of people in the labour force grew from 76.9 million at the end of December 2015 to 80.7 million at the end of December 2016, an increase of 4.9%. According to the CBN's report, the proportion of unemployed people in the labor force

rose to 13.9% by the end of December 2016, compared to 10.4% at the end of December 2015. The unemployment rate jumped from 14.2% in the fourth quarter of 2016 to 18.8% in the third quarter of 2017 (CBN, 2018).

The labour force participation rate in Nigeria was 77.3% in the first quarter of 2024. When looking at where people live, the rate was 82.5% in rural areas and 74.0% in urban areas. For males, the participation rate was 77.5%, and for females, it was 77.1% (NBS, 2024). Compared to the first quarter of 2023, when the rate was 79.9%, it dropped by 2.6% in Q1 2024. The employment-to-population ratio, which shows how many people in the working-age group are employed, went down to 73.2% in Q1 2024 from 75.6% in Q3 2023 (NBS, 2024). When looking at gender, 74.2% of males and 72.3% of females were employed in Q1 2024. In urban areas, the employment-to-population ratio was 69.5%, while in rural areas, it was 78.9%. This is lower than the 71.1% in urban and 80.7% in rural areas recorded in Q3 2023 (NBS, 2024).

The percentage of people who are self-employed dropped from 86% in the first quarter of 2023 to 84% in the first quarter of 2024. Survey results show that the number of people working as employees increased between the first quarter of 2024 (16.0%) and the third quarter of 2023 (12.7%). For females, the self-employment rate was 87.9%, while for males it was 79.9% (NBS, 2024). When looking at where people live, the self-employment rate in rural areas was 91.9%, compared to 78.2% in urban areas. Information about informal employment is important for understanding the quality of jobs in an economy. The rate of informal employment in Nigeria remains high, slightly rising from 92.3% in the third quarter of 2023 to 92.7% during the reference period (NBS, 2024). According to the National Bureau of Statistics (NBS), the higher someone's education level, the less likely they are to be in informal employment. People without any formal education were mostly involved in informal employment, as shown in the figure below. In the first quarter of 2024, about 92.7 million Nigerians were in informal employment (NBS, 2024). It is also important to note that women are more likely to be in informal employment than men. The rate of informal employment for people living in rural areas was 97.6%, while it was 89.0% for those in urban areas (NBS, 2024).

The unemployment rate in the first quarter of 2024 was 5.3%, which is higher than the 5.0% recorded in the third quarter of 2023. For males, the unemployment rate was 4.3%, while for females it was 6.2%. When looking at where people live, the unemployment rate was 6.0% in urban areas and 4.3% in rural areas during Q1 2024 (NBS, 2024). For young people, the unemployment rate was 8.4% in Q1 2024, which is slightly lower than the 8.6% seen in Q3 2023 (NBS, 2024). Based on education level, the unemployment rate was 2.0% for those with post-graduate education, 9.0% for those with post-secondary education, 6.9% for those with secondary education, and 4.0% for those with primary education in Q1 2024 (NBS, 2024).

3. Theoretical and Empirical Review

John Maynard Keynes introduced the Keynesian theory of employment in his book *The General Theory of Employment, Interest and Money* (1936). His idea is that the number of

people employed depends on the total amount of spending in the economy. Keynes believed that unemployment happens when aggregate demand is insufficient to stimulate production, which in turn will help create employment for more workers. He said this isn't because people don't want jobs or wage rigidities, but because the overall demand for goods and services isn't strong enough (Keynes, 1936). Keynes emphasized that total demand is composed of consumption, investment, government expenditure, and net exports. When any of these components weaken, the total demand goes down, leading firms stop producing as much, leading to fewer jobs (Snowdon & Vane, 2005). So, the theory suggests that the government should step in, especially by spending more money, to boost the economy and create more jobs.

Public spending on education is an important part of aggregate demand. Keynesian theory asserts that expansionary fiscal spending, such as hiring teachers, constructing classrooms, and funding school programs, stimulates income and employment (Blinder, 2008). In Nigeria, public expenditure on education influences employment directly by creating teaching and non-teaching jobs, and indirectly through increased demand in sectors like construction, publishing, ICT, and transportation. When the government reduces spending on education, aggregate demand will fall, which in turn will contribute to rising unemployment. This is consistent with Keynes' view that insufficient public expenditure can cause an underemployment equilibrium (Keynes, 1936).

Keynesian analysis also recognizes the importance of public investment in improving long-term productivity. Education spending contributes to human capital development, increasing the employability and productivity of the labour force (Schultz, 1961; Becker, 1993). In Nigeria, a major cause of high unemployment, especially youth unemployment, is a skills mismatch between graduates and labour-market demands (Adebayo, 2021). Increased government spending on teacher training, curriculum reform, technical education, and vocational programs is expected to help address structural unemployment by equipping workers with relevant labour-market skills. This aligns with Keynesian expectations that improved human capital raises productivity and stimulates private-sector investment (Todaro & Smith, 2015).

A core Keynesian concept is the multiplier effect: an initial increase in government spending produces a larger increase in national income (Samuelson & Nordhaus, 2010). Education expenditure has a strong multiplier effect because it triggers employment across multiple sectors. In Nigeria, where the marginal propensity to consume is high, increases in education spending will lead to higher consumption and employment in both urban and rural areas (Onye & Alawuba, 2022). Thus, expanding education budgets will generate ripple effects that reduce unemployment beyond the education sector itself.

Ogunmuyiwa and Adeshina (2021) opined that Keynesian theory sees demand deficiency as a major cause of unemployment. Nigeria's persistent unemployment crisis can partly be explained by inadequate government investment in key sectors, such as education. Underfunding results in insufficient teacher recruitment, inadequate school infrastructure, and stagnation in sectoral expansion, all of which limit job creation. Moreover, when education budgets fall, household welfare declines, consumer demand

weakens, and firms reduce hiring — a cyclical unemployment effect described by Keynes (1936).

Keynesians argue that strategic government spending will foster inclusive and broad-based growth. Increasing education expenditure can reduce regional inequalities, promote social mobility, and broaden access to employment opportunities (Stiglitz, 2010). In Nigeria, where disparities in educational access contribute to unemployment and underemployment, increasing public funding for education enhances human capital and supports inclusive job creation.

In summary, the Keynesian Theory of Employment provides a strong framework for understanding how government education expenditure affects unemployment in Nigeria. Because education spending increases aggregate demand, enhances human capital, and stimulates multiplier effects across the economy, it serves as a powerful tool for reducing both cyclical and structural unemployment. Therefore, increasing government investment in the education sector aligns with Keynesian prescriptions for addressing unemployment and promoting economic stability.

Based on the Keynesian idea, Meghir and Palme (2005) used quantitative techniques to look at how a school reform in Sweden during the 1950s affected people's education and how much they earned. They used numbers to study this and found that people whose fathers only had the minimum education saw improvements in both their education and earnings because of the reform.

Confirming the power of education, Biagi and Lucifora (2008) gathered information about workers from ten European countries to see how education affects joblessness. They used numbers again and said that, when other things like age or the economy are kept the same, having more education usually means lower unemployment rates.

As noted by Grimaccia and Lima (2013), who studied the connection between employment rates and spending on education, their research looked at 27 European Union countries. The model they used showed that in countries where there has been more investment in education, on average over the last 10 years, the employment rate has also been higher.

Ding (2014) studied 34 OECD countries from 1980 to 2010 using a two-way fixed effect model for panel data. They tested for endogeneity and perseverance to understand the link between government welfare spending and unemployment. The results showed that spending on wellbeing as a percentage of GDP has a positive and significant effect on unemployment. Spending on healthcare also had a slightly positive and significant effect on unemployment, while government spending on other social services had an insignificant effect on the unemployment rate.

Chandra and Sharma (2015) did a study on how education and unemployment are connected in different states of India between 1991 and 2011. They used panel data analysis and looked at both long-term and short-term relationships. Their findings showed that, in the long run, greater education is associated with lower unemployment. This means that when people have more education, the rate of people without jobs goes

down. But in the short run, they found that unemployment affects education levels in one direction only.

Mahdi and Shahid (2017) studied how spending on education relates to unemployment in Pakistan using data from 1980 to 2016. They used an ARDL model. Their results showed that increasing education spending has a negative and important effect on unemployment over the long term. But when they checked the short-term effects, the spending didn't show a strong or clear impact.

Ademola and Omokeji (2018) used the Vector Error Correction Model (VECM) and Granger causality methods to look at how education and unemployment are connected in Nigeria between 1981 and 2014. Their findings showed there is a long-term, significant link between education and unemployment in the country. The Granger causality test showed that education affects unemployment, but not the other way around.

Ajenifuja (2019) looked at the relationship between education spending and unemployment rate in Nigeria from 1981 to 2016. They used the Autoregressive Distributed Lag (ARDL) method. Their study found a long-term connection between education spending and unemployment. It also showed that education spending has a strong negative effect on unemployment, showing that investing in education is important for reducing unemployment in Nigeria.

Hasanov (2019) looked at how government spending on education affected unemployment in Azerbaijan from 1995 to 2017. They used a method called Autoregressive Distributed Lag (ARDL) bounds testing. Their study found that government education spending had a negative and significant effect on unemployment in the long run. However, in the short run, the effect was not significant. This suggests that investing in education can help reduce unemployment over time.

Naseri and Shahrestani (2019) studied how education spending affected unemployment in Iran. They used quarterly data from 1991Q1 to 2016Q4, which is a 26-year period. They analyzed both short-run and long-run effects using ARDL, bounds testing for cointegration, and an error correction model (ECM). Their results showed that total education spending had a negative and statistically significant impact on unemployment in both the short run and the long run in Iran.

Bampasidis and Sekeris (2020) looked at how spending on education affected unemployment in Greece using data from 2000 to 2017. Their study found that there was a clear link between spending on education and lower unemployment in Greece. This means that when the government spends more on education, it helps reduce unemployment during that time. The study also showed that the quality of education plays a big part in this relationship. So, improving the quality of education can make the effect of education spending even better at reducing unemployment.

Opuala-Charles and Oshilike (2023) studied how education investments affected unemployment in Nigeria from 1991 to 2021. They used a method called Autoregressive Distributed Lag (ARDL) Bounds testing. Their results showed that government spending on education did not have a strong positive effect on unemployment in Nigeria. However, other factors like credit given to the private sector, school enrollment rates, and

fixed capital investments matched what was expected, but they were not statistically significant, meaning they didn't show a clear effect.

Looking at past studies about how government spending on education affects unemployment, there are mixed results. Some studies, like those by Mahdi and Shahid (2017), Ajenifuja (2019), Naseri and Shahrestani (2019), and Bampasidis and Sekeris (2020), found that spending on education is linked to a lower unemployment rate. However, the study by Opuala-Charles and Oshilike (2023) showed that government education spending has a positive and weak effect on unemployment. Because of these different findings, there is a big debate about how education spending really impacts unemployment in Nigeria. This has led to an important question: what is the real connection between government education spending and unemployment in Nigeria? The main focus of this paper was to answer this question because previous studies have not kept up with the current situation regarding public spending on education and unemployment in Nigeria. Researchers like Mahdi and Shahid (2017), Ajenifuja (2019), Naseri and Shahrestani (2019), and Bampasidis and Sekeris (2020) looked at how public education spending affects unemployment generally, but they didn't break down the government's spending into different parts, like capital spending and recurrent spending. This study, however, looked at how the federal government of Nigeria spent on education, separating it into capital and recurrent expenditures, to understand how each type of spending affected unemployment in Nigeria from 1980 to 2023.

3. Materials and Methods

This study used data that were already collected for the years 1980 to 2023. The data included yearly information on the unemployment rate, money spent on education (capital and recurrent expenditure) by the government each year and the rate of inflation. This information was taken from the statistical report of Nigeria's main bank, the Central Bank of Nigeria, for the same time period. The researcher would have liked to look at data starting from 1960, when Nigeria became independent from Great Britain, up to 2024. However, because there wasn't enough data available for those years, the researcher had to use the data that was available. That's why the study focused on the period from 1980 to 2023.

3.1 Model Specification

The research model used in this study is based on the clear version of Keynesian theory, which shows that increasing government spending can boost economic activity and create more jobs. That is, UER = f(PS), where UER is the unemployment rate, and PS is public spending in the educational sector. However, following the theoretical underpinning, this study utilized unemployment rate (UER) as the dependent variable, disaggregated government spending on education into recurrent and capital expenditure. Also, the study included the inflation rate in the model. Therefore, the model used in this study is explained as follows:

$$UER = F(GCEE, GREE, INF) \quad (1)$$

From the above functional model or association between the dependent and explanatory variables, the econometric form of the model was specified as follows:

$$UER_t = \varphi_0 + \varphi_1 GCEE_t + \varphi_2 LnGREE_t + \varphi_3 INF_t + \varepsilon_t \quad (2)$$

The log form of equation (2) produced;

$$UER_t = \varphi_0 + \varphi_1 LnGCEE_t + \varphi_2 LnGREE_t + \varphi_3 INF_t + \varepsilon_t \quad (3)$$

Where;
UER is the unemployment rate,
GCEE is the government capital expenditure on the educational sector,
GREE is the government's recurrent expenditure on the educational sector,
INF is the inflation rate,
ε is *the* error term, which denotes other variables not included in the model,
Ln is natural log,
t is the period of time, and
φ_0 is the intercept.

The parameter estimates are expected to behave in line with $\varphi_1, \varphi_2 < 0$; while $\varphi_3 > 0$.

3.2 Techniques of Data Analysis

In this study, the Augmented Dickey-Fuller (ADF) unit root test and the Autoregressive Distributed Lag (ARDL) Bounds Test were used as the main methods for analysis. Importantly, each variable in the model was checked for stationarity using the ADF test.

Typically, the ADF test involves running this regression:

$$\Delta Y_t = M_1 + M_2 t + \delta Y_{t-1} + \Sigma \alpha_i \Delta Y_{t-i} + \varepsilon_t \quad (4)$$

Where:
Y = a time series,
t = a linear time trend,
Δ = first difference operator,
ε = a pure white noise error term,
M_1 = a constant,
M_2 and δ = parameters, and
$\Delta Y_{t-I} = (Y_{t-1} - Y_{t-2})$, $\Delta Y_{t-2} = (Y_{t-2} - Y_{t-3})$, etc.

The number of lagged difference terms to include is usually decided through testing. The goal is to have enough terms so that the error term in equation (3) is not correlated over time. In ADF, we test whether $\delta = 0$ (Gujarati & Sangeetha, 2007).

This study used the Autoregressive Distributed Lag (ARDL) Bounds testing method for co-integration, which was developed by Pesaran and Shin in 1999. Unlike other co-integration tests, the bounds test can be used no matter if the variables in the model are I(0), I(1), or a mix. However, this method isn't suitable when there are I(2) series. So, before using the Bounds Test, it was important to check the integration level of all the variables involved by using the ADF Test. To determine if the variables in this study are co-integrated or have a long-term relationship, the Bounds F-statistic was calculated. The null hypothesis of no co-integration is rejected if the test statistic is higher than the upper critical value, and it is not rejected if the F-statistic is lower than the lower critical value. If the result falls between these two values, the co-integration test is inconclusive. The ARDL method was used to examine both the long-term and short-term relationships among the variables. See equation five for the ARDL model:

$$\Delta UER_{t,j} = b_0 + b_1 UER_{t-1,j} + b_2 GCEE_{t-1,j} + b_3 GREE_{t-1,j} + 4INF_{t-1,j} + \sum_{i=1}^{n1} a_{1i,j}\Delta UER_{t-1,j} + \sum_{i=0}^{n2} a_{2i,j}\Delta GCEE_{t-1,j} + \sum_{i=0}^{n3} a_{3i,j}\Delta GREE_{t-1,j} + \sum_{i=0}^{n4} a_{4i,j}\Delta INF_{t-1,j} + \mu_t \; -- \; --- (5)$$

The vector error correction model is specified as follows:

$$\Delta UER_{t,j} = b_0 + \sum_{i=1}^{n1} a_{1i,j}\Delta UER_{t-1,j} + \sum_{i=0}^{n2} a_{2i,j}\Delta GCEE_{t-1,j} + \sum_{i=0}^{n3} a_{3i,j}\Delta GREE_{t-1,j} + \sum_{i=0}^{n4} a_{4i,j}\Delta INF_{t-1,j} + \lambda ECMt - 1 + \mu_t \; -- \; --- (6)$$

Where Δ is the difference operator, while εt is white noise or error term, n is the optimal lag length, $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ represent the short-run dynamics of the model and b_1, b_2, b_3, b_4 are the long-run elasticities, and μ_t is the error term. ECM_{t-1} is the error correction term obtained from the co-integration model. The error coefficients (λ_1) show how quickly the co-integration model fixes the imbalance from the previous period or how fast it adjusts to bring the variables back to their long-term relationship. The coefficient for the Error Correction Mechanism (ECM) is expected to be negative and statistically significant. A negative and significant ECMt-1 coefficient means that any short-term changes between the dependent and explanatory variables will eventually return to the long-term equilibrium.

4. Results and Discussion

This study looked at how money spent by the Nigerian federal government on education has affected unemployment in the country from 1980 to 2023. To do this, the study

constructed an econometric model. In the model, the real unemployment rate was the dependent variable. The other factors considered were the government's spending on education for capital projects, its spending on education for recurrent purposes, and the inflation rate. See the different results from the regression analysis and the tests done after the estimates in Tables one through six.

Table 1: Augmented Dickey-Fuller (ADF) Unit Root Test

Variables	Level form		First difference		Order of integration
	ADF Statistics	5% Critical Value	ADF Statistics	5% Critical Value	
UER	-3.696837	-3.518090	-	-	1(0)
GCEE	-1.839511	-3.518090	-6.164957	-3.520787	1(1)
GREE	-3.292272	-3.518090	-10.47782	-3.520787	1(1)
INF	-3.796005	-3.520787	-	-	1(0)

Note: UER, GCEE, GREE and INF as earlier defined
Source: Author's Computed Result from (E-views 10)

The ADF test results for each series in Table 1 show that at the 5% significance level, GCEE and GREE became stationary after one difference 1(1) because their ADF values are higher than the 5% critical values. On the other hand, UER and INF were already stationary at their original level 1(0). Since the variables are integrated of order 1(0) and 1(1), it is appropriate to use an ARDL model to check for a long-run relationship.

Table 2: ARDL Bounds Test for Co-integration

Model		**F-Statistic =** 6.012670
UER= F(GCEE, GREE, INF)		K = 3
Critical Values	**Lower Bound**	**Upper Bound**
5%	4.01	5.07

Note: UER, GCEE, GREE and INF as earlier defined.
Source: Author's Computed Result from (E-views 10)

The ARDL bounds test for cointegration indicates a long-term relationship among the variables (UER, GCEE, GREE, and INF). This is because the F-statistic, which is about 6.013, is higher than the upper critical value at the 5% significance level. This result means the rejection of the idea that there's no long-term relationship among these variables at the 5% significance level. Once this long-term relationship was confirmed, the long-run and short-run effects of the variables were then calculated.

Table 3: Estimated ARDL Long Run Coefficients. Dependent Variable: UER
ARDL (1, 0, 0, 0)

Regressors	Coefficient	t-Statistic	P-Value
LOG(GCEE)	1.335098	0.921807	0.3626
LOG(GREE)	-4.092866	-2.326524	0.0256
INF	-0.009364	-0.218737	0.8281

Note: UER, GCEE, GREE and INF as earlier defined.
Source: Author's Computed Result from (E-views 10).

The estimated long-run ARDL coefficients show that in the long term, government spending on education for capital projects has a positive but not significant effect on the unemployment rate in Nigeria. On the other hand, government spending on education for regular operations (recurrent expenditure) has a negative and significant effect on the unemployment rate in Nigeria. The inflation rate also has a negative but not significant effect on the unemployment rate in Nigeria.

Table 4: Error Correction Representation for the Selected ARDL Model

ARDL(1, 0, 0, 0)

Regressors	Coefficients	t-Statistic	P-Value
LOG(GCEE)	0.474611	0.358689	0.7222
LOG(GREE)	-0.237896	-0.169556	0.8664
INF	0.010921	0.293130	0.7713
ECM (-1)	-0.754947	-5.099092	0.0000
R-squared = 0.779522 Adjusted R-squared = 0.731292	Akaike info criterion = 5.312280	Schwarz criterion = 5.650056 Prob(F-statistic) = 0.000000	Durbin-Watson stat = 2.051609

Note: UER, GCEE, GREE and INF as earlier defined.
Source: Author's Computed Result from (E-views 10).

Table 4 shows the results of the short-term dynamic coefficients linked to the long-term relationships from the ECM equation. The ECM has the correct sign, which is negative, and it is also statistically significant. This means that any imbalance in UER from the previous year is corrected in the current year. The Durbin-Watson value of 2.051609 indicates that there is no issue with autocorrelation in the model. The R-squared value of 0.779522 shows the good fit of the model.

The coefficient for government capital spending on education came out with the wrong sign, which is positive, but according to economic theory, it should be negative. This means that if the government increases its spending on education by a certain percentage, the unemployment rate would go up by about 0.474611 percent. However, this result doesn't match what we expected beforehand. Also, the government spending on education wasn't statistically significant at usual levels. So, the conclusion is that government capital spending on education has a positive but not significant effect on the unemployment rate in Nigeria during the study period. This result agrees with the findings of Opuala-Charles and Oshilike (2023), who also found that government spending on education has a weak positive link with unemployment in Nigeria. This suggests that the federal government's annual capital spending on education hasn't increased overall demand, boosted investment, or lowered unemployment during the study period. This could be because of poor funding, poor management of national resources, misuse of funds, and wasteful spending in Nigeria.

Furthermore, the coefficient for government recurrent expenditure on education showed the right sign, which is negative. This means that if government recurrent spending on education increases by a certain percentage, the unemployment rate is expected to decrease by 0.237896 percent. This result aligns with what economic theory

would predict. The government's recurrent spending on education is also statistically significant at a standard level, meaning the relationship is unlikely to be due to chance.

As a result, it was found that government spending on education had a significant impact on the unemployment rate in Nigeria during the study period. This finding matches earlier studies by Mahdi and Shahid (2017), Ajenifuja (2019), Naseri and Shahrestani (2019), and Bampasidis and Sekeris (2020), who also found a negative and significant link between education spending and unemployment. Meanwhile, the inflation rate has a positive and insignificant association with the unemployment rate in Nigeria during the period of study.

5. Post Estimation Test

In this study, diagnostic tests were carried out to check if the estimated model can be trusted for making policy predictions or recommendations. The study used the Wald test to check restrictions on coefficients, the Breusch-Godfrey (B-G) Lagrange Multiplier (LM) test to detect serial correlation, and the Autoregressive Conditional Heteroskedasticity test (Breusch-Pagan-Godfrey). The results of these tests are presented in Tables 5, 6, and 7.

Table 5: Wald Test Result

Wald Test:			
Equation: Untitled			
Test Statistic	**Value**	**Df**	**Probability**
F-statistic	134.6750	(4, 32)	0.0000
Chi-square	538.7000	4	0.0000

Source: Authors' Computed Result from (E-views 10).

The results in Table 5 show that the F-statistic is around 135, and the probability value of 0.0000 is lower than 0.05, which is the usual 5 per cent significance level. This means that all the variables used in the model together have a significant impact on explaining the unemployment rate in Nigeria during the time period covered by the data.

5.1 Test for Serial Correlation

The Breusch-Godfrey Serial Correlation LM test was used as a more advanced statistical method to check if there is no serial correlation, compared to the idea that there is serial correlation in the ECM results, at a 5 percent level of significance.

Table 6: Breusch-Godfrey Test for Serial Correlation

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.391748	**Prob. F(2,30)**	0.6793
Obs*R-squared	1.018072	**Prob. Chi-Square(2)**	0.6011

Source: Computed by the researcher using E-Views 10.

The results in Table 6 show that the error correction model does not have a serial autocorrelation issue. This is because the chi-square value and its associated probability are higher than 0.05.

5.2 Heteroskedasticity Test Results

The Breusch-Pagan-Godfrey test, which is also called the Autoregressive Conditional Heteroskedasticity test, was used to determine if the variability of the error terms in the ECM model is constant across all levels.

Table 7: Autoregressive Conditional Heteroskedasticity Test Result

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.148871	**Prob. F(6,34)**	0.9880
Obs*R-squared	1.049553	**Prob. Chi-Square(6)**	0.9837
Scaled explained SS	8.802345	**Prob. Chi-Square(6)**	0.1850

Source: Computed by the researcher using E-Views 10 (2025).

The Breusch-Pagan-Godfrey test result in Table 7 shows that the error correction model does not have heteroskedasticity, meaning the variance of the residuals in the unemployment rate model is consistent throughout the time period covered in this study.

6. Conclusion and Recommendations

This study closely looked at how spending on public education affects unemployment in Nigeria from 1980 to 2023. The research used data on unemployment rates, government spending on education (both capital and recurrent expenses), and inflation rates, which were taken from reports by Nigeria's central bank. The study used a special economic method called ARDL to understand the association between the variables in the short term and long term. The findings showed that in both the short and long term, spending on capital projects in education did not have a strong effect on reducing unemployment. However, recurrent spending on education had a clear and meaningful impact in lowering unemployment. The study also found that inflation had a mixed effect, with a negative impact in the long term and a positive effect in the short term. The conclusion was that only the recurrent spending on education made a significant difference in reducing unemployment during the study period. Therefore, the government should ensure there is sufficient funding for education and that public money management laws are properly followed to ensure funds are used wisely and effectively. This will improve the quality of teaching, curriculum content, and learning facilities, which in turn will make students more competitive in the labour market, increases workers' productivity by equipping them with cognitive and technical skills required in modern economies, ensures graduates possess relevant capabilities demanded by employers, promotes innovation, creativity, and business creation capacities and helps produce job-ready graduates aligned with labour market needs.

Conflict of Interest Statement
The author declares no conflicts of interest.

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