

# The Unemployment Epidemic in Nigeria

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**Abstract:** Over the years, unemployment has become a worldwide epidemic that has caused many individuals to experience poverty and a lack of education. It has become such a problem in Nigeria that the numbers for this country increase by millions each year. Year by year, the statistics for unemployment grow exponentially. Due to these high rates, it has become necessary to examine the unemployment dynamics to better understand the contributing factors and how they play a role in the statistical data. The purpose of this study is to use differential equations to create a mathematical model that will predict how quickly unemployment rates will increase exponentially over the next ten quarters, beginning with the third quarter of 2019. Afterwards, I will propose effective solutions that will cause the population of unemployed Nigerians to decrease.

## 1 Introduction

Unemployment has become one of the most prominent issues across the entire globe, especially in some countries outside of the United States. Studies have shown that many countries in Africa have millions who are unemployed. Of those, Nigeria's unemployment rate has been reported to be one of highest. Nigeria's data give the impression of it being an area with no opportunities. Every country has issues and unemployment is just one of Nigeria's. The country has traditions and customs, and the people that inhabit it have lifestyles just like residents of any other country. So, what are some of the typical traditions/customs like?

## 2 Culture and Traditions

In many African countries, there are a plethora of tribes that inhabit the area. When it comes to Nigeria, there are over 250 tribes that all have their own traditions. For example, the Omugwo tradition is very prevalent among the Igbo tribe but is also used by the Yorubas, Igalas, and the Annrangs. The Yorubas call it *Itoju-omo*, Igalas call it *Iwagwala-*

*oma*, and the Annarangs refer to it as *Umaan*. Omugwo involves the mother-in-law taking care of the newborn and preventing the mother from even lifting a finger for three months [17].

Another Nigerian tradition relates to growth and wealth. It is called the *Nwaboy*, and it is prominent among the Igbo people. This tradition is used to educate young Nigerian men in business and prepare them for the future. The young man leaves his family's home with an older, rich relative or family friend and is entrusted with activities ranging from errands to supervision and transacting business. After the training is over, the participant is given some funds to start a business to sustain himself and his family [17].

However, many traditions are not tied to specific groups but are more general. For example, many Nigerians find it very disrespectful to eat, greet, or hand over things with the left hand unless the person is left-handed or has no right arm [17]. Furthermore, with some of these traditions, certain dress styles are worn to celebrate them. According to "Nigerian Traditional Clothes", traditional attire is worn daily in many areas of Nigeria, but in other areas traditional attire is worn on special occasions. For different tribes in Nigeria, like the Igbo, the traditional clothing for women is decorated with some designs for day-to-day activities and others for formal occasions. Formal attire consists of wraps that are made of a more expensive material imported from another country. For men, the traditional attire is cotton wrappers, pants, shirts, and sandals for daily wear, and the formal attire consists of wraps made from better material than the ones used for what they wear daily [15]. Fashion in Nigeria is part of everyday life, and it symbolizes how free the people are to wear whatever they want.

Food is another important part of Nigerian culture. Many Nigerians in the northern region have diets based on beans, sorghum, and brown rice. In contrast, other tribes like the Hausa, love to eat meat in the form of tserere (kebabs, which are chunks of roasted, skewered meat). Many Nigerians live by old mealtime customs. A plethora of them rise as early as 5 A.M. and eat a small breakfast that can consist of rice and mangoes followed by lunch (which is the most important meal of the day) at 11 A.M.; typical lunches are efo stew or moin-moin [9].

When it comes to preparing these meals, the wife is responsible while the husband is only responsible for the funds. Many unemployed Nigerian women are restricted from working by their husbands because their husbands do not want them to stress and instead want them to live comfortably [11].

### 3 Finance and Government

As for the currency that is used, Nigerians use the Nigerian Naira, and its symbol is ₦ [13]. The average USD dollar exchanges to 361.03 Naira in Nigeria (US). The term *Naira* was coined by Obafemi Alowo when he was serving as the federal commissioner between 1967 and 1971. His daughter, Tokunbo Awolowo said, "he just took the name of Nigeria and collapsed it to Naira when he was the Federal Commissioner for Finance" [23].

Before the Nigerian Naira, there was another currency called the Nigerian Pound, introduced in 1907 under the British mandate, with the minor unit being Shillings.

However, the Central Bank of Nigeria decided to change to decimal currency due to the recommendations of the Decimal Currency Committee in the 1960s [23].

The use of Pounds instead of Naira was because of the ownership of the country at the time. Nigeria was not always an independent country; it was not until October 1, 1960, that Nigeria officially got its independence [10]. In 1973, the Naira was introduced, and it replaced the Nigerian Pound at a rate of two Nairas equal to one Pound [23].

Four years after the introduction of Naira, a new banknote denomination of twenty Naira was issued on Friday, February 11, 1977. It became the first currency to bear the portrait of a Nigerian citizen, General Murtala Ramat Mohammed. He was the late head of state and torchbearer of the Nigerian Revolution in July 1975. This new denomination of twenty Naira was issued on the first anniversary of his assassination as a tribute to the most “illustrious son of Nigeria”. Two years later, three more denominations were introduced. On July 2, 1979, the ₦1, ₦5, and ₦10 were introduced and were given distinctive colors and portraits of three “eminent and courageous Nigerians” to help in identification. Unfortunately, five years later, the colors on not just those three but all the banknotes were changed due to the currency trafficking prevalent at the time. There would not be any notable changes to the system until 1991 when the Niara were coined. Then the ₦100, ₦200, ₦500, and ₦1000 banknotes were introduced in December 1999, November 2000, April 2001, and October 2005 respectively [7].

The government of Nigeria is very similar to that of the United States. It is a federal republic with a presidential system. Just like the U.S., it has three branches of government: legislative, judicial, and executive. The current constitution was adopted in 1999; it was the fourth constitution following independence from the United Kingdom that restored democratic rule to Nigeria [12]. Its emergence ended 16 years of consecutive military rule [14]. Despite all accomplishments, the government and even the country itself still faces many issues that perpetuate.

## 4 Unemployment Situation

Nigeria has multiple problems that heavily influence the exponential growth of unemployment rates, such as education, infrastructural challenges, and safety problems.

In Nigeria, illiteracy levels are very high. According to Okwuagbala Uzochukwu Mike, a television report on September 9, 2014 stated that “10.5 million Nigerian children are out of school” [18]. The education system suffers from internal and external factors. For example, many lecturers are bribed for good grades, and even the conditions of the schools do not currently match in quality to not only Western nations, but other African countries like Ghana and South Africa. During the late 1990s, the federal government expenditure on education was below 10% of the overall budget, and later, in 2013, it was reported that the budget was ₦426.53 billion which amounts to only 8.8% of the total budget (₦4.92 trillion). The universities and institutions just are not in good shape and are not receiving the support needed to promote education [18].

Furthermore, the infrastructural challenges the Nigerians face daily discourages education. The power sector is corrupt and mismanaged, which causes many academic and business institutions to undergo power outages and limited access to electricity [18].

Along with the poor conditions of the roads, there is just a lack of support for the well-being of Nigerians. Many Nigerians often do not feel safe in their own homes. Some say that they feel as if “they can no longer walk around their own neighborhoods unharmed” [18]. Kidnapping has become very prevalent, so much so that it has turned into a business where individuals can profit from it. The kidnapping epidemic got so big that on December 10, 2017, Chukwudi Onuamadike, the most notorious high-profile kidnapper, was arrested; this was the biggest kidnapping news in Nigeria during 2017 [18].

In summary, Nigerians are daily forced to deal with poor education, terrible infrastructure, limited transportation options, and no support. It is these types of issues that cause/promote unemployment in Nigeria.

Unemployment in Nigeria is one of the most prominent issues that has seen significant increases in the last couple of years. Unemployment is defined as an economic condition in which a person is looking for a job but is unable to find one, and it is expressed a percentage of the total labor force [3]. There are multiple types of unemployment in Nigeria: structural, frictional, cyclical, and classical. Structural unemployment occurs when the technology replaces the workers with machinery and causes layoffs in the economy. Frictional unemployment occurs when a person does not have the credentials for a job. Cyclical unemployment (also defined as Keynesian) occurs when the demand of the economy is not enough to give jobs to everyone who wants to work. It is caused by the total supply of goods exceeding the total demand, which can discourage production and reduce the number of workers in the process [2]. Classical unemployment can occur when the wages a person deserves is more than the amount the employer is willing to pay [4].

In Nigeria, the rate for these unemployment types is attributed to numerous factors like the huge number of school graduates with no opportunities for matching employment to their major course of study, or the freeze on employment in many public and private sector institutions [2]. However, there have been some intervention programs made to help combat these. In Northern Nigeria, there was a three-day workshop titled *Click-On Kaduna* that aimed to equip unemployed Nigerians with skills necessary to apply for online jobs through practical training on how to set up an online profile, establish a personal brand, and land the first job [8]. Furthermore, the Nigerian government’s initial reaction was to draft the youth into agriculture programs, but they decided to make a more rational choice [1]. A 2012 program called *SURE-P* focused on management and investment of federal government savings and offered the opportunity for one-year internships in banks and agencies [1]. Due to the prevalence of unemployment in Nigeria, it became a necessity to examine the dynamics to further understand why the rates are becoming so high, to predict where they will be in the next couple of years, and to find a solution to the issue.

## 5 Mathematical Modeling

The Exponential Growth and Decay model,  $y' = ky$ , was used for this experiment because of its utility. It has a very practical ability to capture the exponential growth or decay of populations. However, it can be also be used for other quantities such as samples, resources, bank investments, and many more [5]. The solution for the Exponential Growth model is

$$y = Ce^{kt},$$

where  $C$  is the constant,  $e$  is the Euler's constant,  $k$  is the positive constant that determines the rate of growth, and  $t$  is the time. For the Exponential Decay model,  $k$  is a negative constant that determines the rate of decay [5]. For this experiment, the Exponential Growth model was used to capture the pattern of growth for unemployment rates in Nigeria. First, we gathered data from the Nigerian National Bureau of Statistics (NBS), as reported by Vanguard [16], and displayed in Table 1, for Q1 2017 to Q3 2018. Then we were able to construct, from two data points (highlighted in yellow), a model that we could extend to multiple concrete points.

<b>t</b>	<b>quarter</b>	<b>population data</b>
-9	Q1 2017	<b>13,230,000</b>
-6	Q2 2017	<b>13,590,000</b>
-3	Q3 2017	<b>15,990,000</b>
0	Q4 2017	<b>17,670,000</b>
3	Q1 2018	<b>19,250,000</b>
6	Q2 2018	<b>20,340,000</b>
9	Q3 2018	<b>20,930,000</b>

Table 1. Nigerian unemployment populations, from Nigerian National Board of Statistics (NBS) [16].

We will measure  $t$  in months. The initial value of  $t = 0$  months was decreased by 3 months when moving down a quarter and increased by 3 when moving up a quarter.

For our initial conditions, the population of unemployed Nigerians during the fourth quarter of 2017 (Q4 2017) was 17,670,000. Therefore, setting  $t = 0$  months will give  $C = 17,670,000$ . Next, after applying the population of 20,930,000 during the third quarter of 2018 (Q3 2018), where for 3 quarters  $t = 9$  months, the rate constant was found. The result is  $k = \ln(1.15)/9 = .02$ , a positive constant that proves that exponential growth is taking place.

Thus, we have a modeling equation of

$$y = 17,670,000e^{0.02t}.$$

The first quarter of 2017, with  $t = -9$  months, was used as a starting point for the modeling experiment. The result was that the model predicted some 14,759,225 unemployed Nigerians in Q1 2017. The following results were consistent with the data that was shared in other articles from Q4 2017 to Q3 2018. See Figure 1.



Figure 1. Our graph of the NBS data from Table 1, 4<sup>th</sup> Quarter 2017 to 3<sup>rd</sup> Quarter 2018 .

After using the data prior to this table and comparing it to the NBS data, it was proven that this modeling experiment can produce concrete values. From this conclusion, it was safe to find the data from Q1 2017 to Q2 2019. Because our model set  $t = 0$  months in Q4 2017, Q1 2017 will have  $t = -9$  months. After performing the calculations, the modeled population at Q1 2017 came out be equal to 14,759,225. From there, it was found that the total population increases by over 900,000 each year and that by the first quarter of 2019, there will be 23,852,005 unemployed Nigerians. The results are listed below in Figure 2.



Figure 2. Graphing our modeling results from 1<sup>st</sup> Quarter 2017 to 2<sup>nd</sup> Quarter 2019.

From here, it was safe to move forward and find what the rates would be like in 10 quarters from Q3 2019. We increased  $t$  by 3 months for each quarter. From our results, we were able to conclude that in every quarter year in Nigeria, the unemployment rates would increase by an average of 900,000 Nigerians, and in Q3 2021, there would be 43,461,187 unemployed Nigerians. See Figure 3.

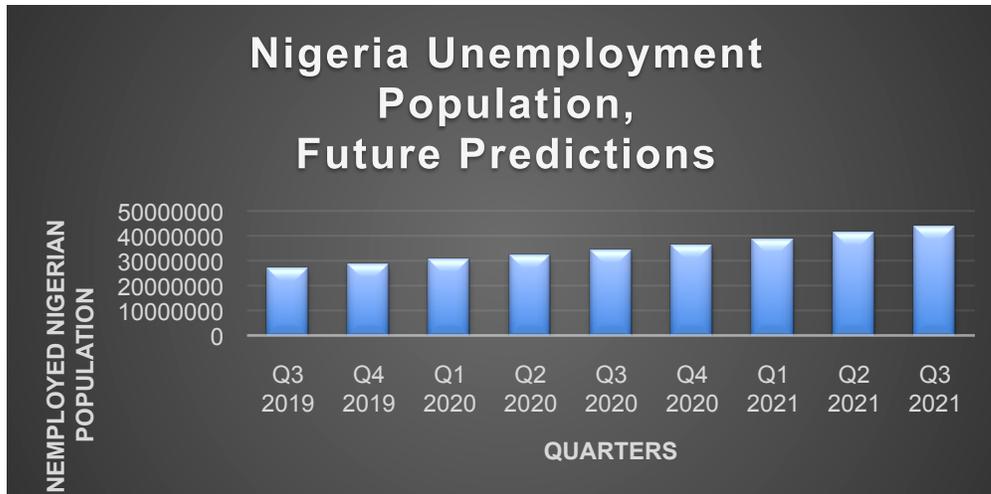


Figure 3. Predicting further into the future with our model.

In summary, we give Table 2 listing the modeling results, accompanied by a graph superimposing the original data (blue) on the modeled data (red).

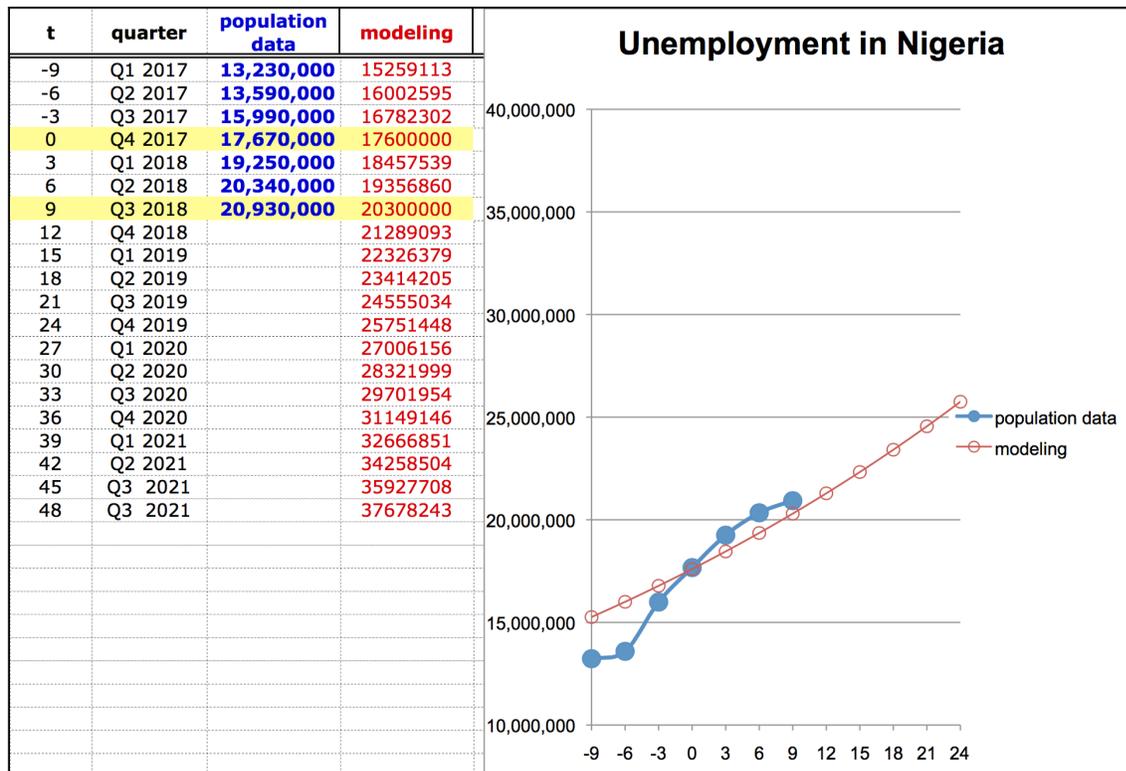


Table 2: Modeling and comparing with given data.

## 6 Ways to Lower Unemployment

However, despite all the negative factors discussed above that play a role in the growth, these rates can be reduced significantly. The absolute best place to start would have to be the infrastructure of many institutions in the cities of Nigeria. These are places where people are educated and gain the skills necessary to get a job. That is why it is essential for the government to rid the country of its lack of water supply and electricity.

It has been reported that it is difficult to get funds from the government due to limited resources and competing needs [20]. But the government does have the money (₦4.92 trillion in 2013) to do so. If enough were disbursed to fix the roads and schools, more jobs could be created. From this, the jobs would increase hired workers' purchasing power and allow for more patrons to support businesses [20]. After fixing the conditions of the roads and schools, the children would be able to get to their schools more easily, and the schools would have conditions that would encourage them to move forward. However, many Nigerians, especially among the youth, do not have the carpentry, plumbing, and bricklaying skills that are needed to rebuild these infrastructures [19]. To fix this, the government sector would have to fund educational institutions for additional curriculum and programs [20].

Along with the low numbers of Nigerians in the lower education systems, there are many graduates from universities without job opportunities. As suggested by “10 Ways To Reduce Unemployment”, if the curriculum of the universities change to give undergraduates the skills that they lack for today’s labor market, that could lead to more possibilities for them in the workforce [20]. With subjects like computer animation, robotics, web courses, data capture, and other technology-related courses, the Nigerians would have skills that are in demand right now [20]. Technology is a discipline that is always advancing and in need of workers. After changing the curriculum, more programs could be added as well to help train them after school hours. With more programs, children will be encouraged to engage more with academics and gain the soft skills through workshops that will help them acquire the credentials necessary to participate in the workforce and bring more money into the economy. If these solutions are brought to fruition, then unemployment will decrease, and Nigeria will see a change for the better.

## 7 Conclusion

In short, Nigeria is a country where the inhabitants are either rich or poor. There is no in-between within the social classes. The poor heavily outnumber the rich and residents often lack the resources they need to move up in the social classes. If nothing is done to improve the economy in Nigeria, the rate of unemployed citizens will exponentially increase to even more staggering numbers. It is imperative that the country find effective solutions to providing some of the unemployed with jobs and/or credentials to get the skills they need to get employed.

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