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Population Dynamics, Savings and Economic Development in Nigeria

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ABSTRACT

The Nigerian government has consistently implemented economic and social policies aimed at enhancing the social welfare of individuals, which will serve as a catalyst for economic growth and development. However, the nation's low capital accumulation and rapidly growing population have rendered all of their efforts futile. Nigeria's current economic situation is not promising. This research examined Nigeria's population dynamics, savings rates, and economic growth from 1980 to 2020. This analysis establishes the presence of a long-run link between the dependent and independent variables using the Autoregressive Distributed Lag (ARDL) framework. The results showed that indicators of population dynamics are negatively correlated with economic growth, and that throughout the research period, both short- and long-term effects of population dynamics on economic development in Nigeria were seen. On the other hand, the adverse impact is negligible in the near term but substantial in the long term. Additionally, the study's findings indicate that Nigeria's savings rate had a significant negative impact on the country's economic development over the study period, both in the short and long terms. This suggests that the percentage of GDP saved in this economy has a negative effect on economic development. The findings also showed that, over the long and short terms, population dynamics and savings in Nigeria had a positive and substantial association. As a result, it is clear from this study that Nigeria has a low savings rate since the country has not been able to capitalize on its enormous population to increase productivity and the labor force. It is sufficient to infer that the Nigerian government must make investments in the development of human capital, as this would inevitably enhance capital formation and, eventually, contribute to national growth.

Keywords: *Population, Dynamics, Saving, Economics Development, ARDL*
JEL Code: *E21 ,J11,O1*

1. Introduction

Like many other developing nations, Nigeria has implemented a plethora of economic policies (such as stabilization and structural reforms) in an effort to raise the standard of life for its people and promote sustainable economic growth and development. It is evident that the nation is extremely fortunate in terms of the number of people living there, in addition to being endowed with an abundance of natural resources (such as lumber and crude oil, among many others). As a result, the World Bank reports that the nation has the largest population in Africa as of 2020. And according to World-meter's elaboration of the most recent United Nations data, Nigeria today has a population of about 200 million people. Any workable strategy for economic development must take demographic characteristics into account, especially for a nation with such a large population.

Nigeria has tried somewhat in the past to slow down population growth. Nigeria adopted its first population policy in 1988. The policy's objective was to limit a couple's kid count to four

by 1995. Nevertheless, the policy's objectives which included lowering the fertility rate and lowering the number of early marriages, which would have lowered the rate of population growth were not met. Another population policy, "The National Policy on Population for Sustainable Development (NPP)" was proposed by Nigeria in 2005. Its failure was attributed to political will, fraud, and a lack of policy implementation. The NPP was intended to raise the standard of living and provide a high-quality livelihood for Nigerian citizens.

A high rate of population expansion is linked to food problems, such as hunger and malnutrition, according to Malthusian theory. But according to Bloom and Freeman (1998), low income and poverty rather than rapid population growth—are the real causes of the food crisis. When money is sufficient to purchase just enough food, the population and food problems may be resolved since prices will then offer sufficient incentives for production. However, in order to fulfill their rising need for food, emerging economies would have to boost their exports, accept foreign help, or borrow money from international organizations. In addition to having a negative effect on the improvement of food supply, rapid population increase has also placed restrictions on savings, foreign exchange, and human resources (United Nations Food and Agriculture Organization, 2017).

Naturally, savings are crucial to the expansion and development of the economy. The ability of a country to invest and create is determined by its savings, and this has an impact on economic growth. Fast population expansion usually slows the accumulation of physical capital per worker and lowers per capita savings. Additionally, there is a greater demand for social infrastructure, and public spending must be directed toward meeting this need rather than directly funding the production of assets. Increased pressure on the balance of payments due to population growth is probably going to exacerbate the foreign exchange restrictions. Food imports will need the growth of new sectors for export growth and/or import replacement. The growing number of people entering the labor market and the quick rise in the population of school age put increasing strain on training and educational facilities and impedes the improvement of educational quality, which is a concern in emerging nations. Furthermore, a dense population increases the demand on employment and the amount of investment available per labor market participant, therefore exacerbating the difficulty of improving population health (Martin 2009).

A country's ability to create and consume more products and services may increase with population growth, resulting in economic expansion. But this is only possible if individuals have access to the required education and skills and if work possibilities are growing at a rate at least as fast as the labor force. Nigeria's fast population expansion would have detrimental effects on the country's development, including poverty, extreme economic disparity, a drop in national savings, and security concerns. The links between Nigeria's population dynamics, national savings, and economic development will be examined in this study.

2. Literature Review

The main purpose of a literature review is to evaluate the significance of significant contributions made to a field of study and to identify any gaps in the literature that still need to be filled. To make things easier to comprehend, the study will evaluate some pertinent literature that is related to the topic of this research project.

2.1.1 Concepts of Population Dynamic

Population dynamics is the study of how a population's size, demographic composition, and geographic dispersion vary over time. These shifts can be linked to shifts in the natural environment, shifts in the political and economic landscape, shifts in the technology used to

manage reproductive health, and eventually shifts in the location and reproductive choices made by humans. Department of Economic and Social Affairs, United Nations, 2013). There is a link between population dynamics and economic development, and population dynamics is important for a country's economic growth. Per capita income affects growth rates, employment, social infrastructure, labor force participation, agricultural development, aggregate demand, capital creation, and the environment. For economists, population dynamics are just as significant as population size. If population growth is outpacing other economic indicators, the government and economists would like to know.

2.1.2 Concepts of Savings

Savings are defined by Ayanwu & Oaikhenan (1995) as the amount of revenue per capital at a given moment that is not spent by economic units. It meant that a portion of the household's discretionary income would not be spent on imported or domestically manufactured consumer goods and services. It stands for undistributed commercial profits for the company. One flow variable that is being measured over time is savings. Savings may be simply described as money that is not spent after taxes. It is reasonable to refer to this as "deferred consumption," as it represents income set aside for potential capital investments or for prudential and speculative purposes in the future. The phrase "disposable income less consumption" sums up saves nicely. Private savings are the primary means of accumulating wealth for investments in developing nations, particularly Nigeria. According to Nkah (1997), saves are defined as the portion of income that is not spent on economic units on a daily basis. In light of the foregoing, Samuelson et al (1998) defined saves as income less consumption. Individuals and corporate entities, like as corporations, can both make savings personal or private savings or corporate savings or retained savings. Corporate savings are the portions of a company's earnings that are not paid out as dividends to shareholders, whereas personal savings are the portion of discretionary income that is not spent. As a result, the total amount of savings that are accessible for a nation is equal to the sum of its foreign and domestic savings.

According to Igbatayo & Agbada (2012), increased national savings encourage greater investment, which raises production. This is true since the amount of savings affects how much capital accumulates. However, as the amount of total production impacts the amount of capital accumulation and savings that families and businesses make, the level of output also influences the amount of total profits.

2.1.3 Concept of Economic Development

The process by which a country, region, local community, or individual's economic well-being and quality of life are enhanced in accordance with certain aims and objectives is known as economic development.

Although the idea has been around in the West for much longer, the phrase has become widely used in the 20th and 21st centuries. Terms like "industrialization," "Westernization," and "modernization" are also frequently employed in discussions about economic progress. Economic development strategies used to be primarily concerned with industrialization and infrastructure, but since the 1960s, they have become more and more focused on reducing poverty.

Todaro (1992) defined economic development as a process that includes structural modifications, faster economic growth, less inequality, and the abolition of absolute poverty. Economic growth is a phenomenon of increased GDP and market productivity; economist Amartya Sen refers to economic growth as "one aspect of the process of economic development." Economic development is the implementation of policies with the goal of

improving the well-being of the populace. While community economic development experts are also interested in social development, economists are generally concerned with the growth side of the economy and the economy as a whole.

2.2. Theory of Demographic Transition

Theory of Demographic Transition is a theory that throws light on changes in birth rate and death rate and consequently on the growth-rate of population. Along with the economic development, tendencies of birth-rate and death rate are different. Because of it, growth rate of population is also different.

Demographic transition refers to a population cycle that begins with a fall in the death rate, continues with a phase of rapid population growth and concludes with a decline in the birth rate. According to this theory, economic development has the effect of bringing about a reduction in the death rate.

The relationship between birth and death rates changes with economic development and a country has to pass through different stages of population growth. C.P. Blacker divided population into five types as high, stationary, early expanding, low stationary and diminishing. According to the theory of demographic transition, population growth will have to pass through these different stages during the course of economic development.

The four stages of demographic transition mentioned by Max are explained as follows:

First Stage:

This stage has been called high population growth potential stage. It is characterised by high and fluctuating birth and death rates which will almost neutralize each other. People mostly live in rural areas and their main occupation is agriculture which is in the stage of backwardness. The tertiary sector consisting of transport, commerce banking and insurance is underdeveloped. All these factors are responsible for low income and poverty of the masses. Social beliefs and customs play an important role in keeping birth rate high. Death rate is also high because of primitive sanitation and absence of medical facilities. People live in dirty and unhealthy surroundings as a result; they are disease ridden and the absence of proper medical care results in large deaths. The mortality rate is highest among the poor. Thus, high birth rates and death rates remain approximately equal over time so that a static equilibrium with zero population growth prevails.

Second Stage:

It is called the stage of Population Explosion. In this stage the death rate is decreasing while the birth rate remains constant at a high level. Agricultural and industrial productivity increases, means of transport and communication develops. There is great mobility of labour. Education expands. Income also increases. People get more and better quality of food products. Medical and health facilities are expanded.

During the stage economic development is speeded up due to individual and government efforts. Increased use of better technology, mechanization and urbanisation takes place. But there is no substantial change in the men, attitude of the people and hence birth rate stays high i.e., economic development has not yet started affecting the birth rate. Due to the widening gap between the birth and death rates, population grows at an exceptionally high rate and that is why it has been called the population explosion stage. This is an Expanding stage in population development where population grows at an increasing rate, as shown in figure, with the decline in death rate and no change in birth rate.

Third Stage:

It is also characterised as a population stage because the population continues to grow at a fast rate. In this stage, birth rate as compared to the death rate declines more rapidly. As a result, population grows at a diminishing rate. This stage witnesses a fall in the birth rate while the death rate stays constant because it has already declined to the lowest minimum. Birth rate declines due to the impact of economic development, changed social attitudes and increased facilities for family planning. Population continues to grow fast because death rate stops falling whereas birth rate though declining but remains higher than death rate.

Fourth Stage:

It is called the stage of stationary population. Birch rate and death rate are both at a low level and they are again near balance. Birth rate is approximately equal to death rate and there is little growth in population. It becomes more or less stationary at a low level.

These stages of demographic transition can be explained with the help of diagram given below:

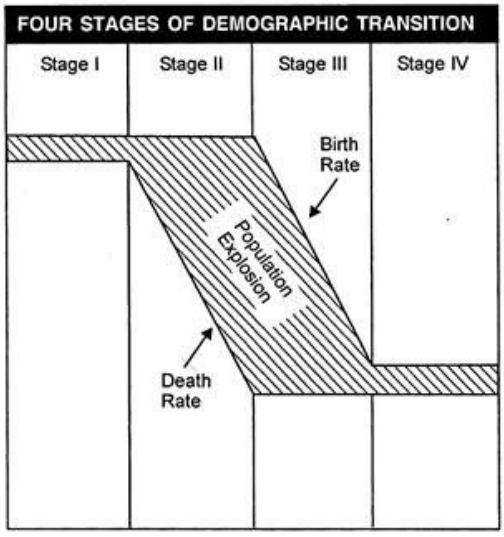

Fig. 6.1. Stages of Demographic Transition

High birth and mortality rates as well as a slow rate of population expansion define Stage I. Stage II is marked by a high and steady birth rate, a quickly dropping mortality rate, and an extremely quick population growth. Stage III is marked by a fast-increasing population, a low and constant mortality rate, and a declining birth rate. Stage IV is defined by a low level of stagnant population, a low birth rate, and a low death rate. The demographic transition theory clarifies variations in the birth and death rates, and therefore the population growth rate, which is utilized in this work to estimate population dynamics.

2.3 Empirical Review

2.3.1 Population dynamics and Economic Development

In 2014, Kehinde carried out research on the impact of population dynamics on Nigeria's economic growth. In his research, he examined how Nigeria's population dynamics affected the country's economic expansion between 1980 and 2010. Techniques from Vector Auto Regressive econometrics were used to examine the data. The findings indicated that Nigeria's population decline will help the nation's development.

In this regard, Aidi, Emecheta, Ngwudiobu, and Ikenna (2016) used time series data covering the years 1970 to 2014 to investigate the link between population dynamics and economic growth in Nigeria. The ordinary least squares estimation approach was used to analyze the data. The findings showed, among other things, that there is an adverse relationship between economic development over the studied time and all three of the study's primary variables: net migration, fertility, and death.

According to Ukpolo (2002), he used the Johansen and Grangercausality model to examine the economic link between population increase and economic growth in Africa. The research is predicated on yearly time series data collected from the two nations (Cote d'ivoire and Nigeria) on the variables of interest (i.e., population and economic growth). The estimation findings indicate that both variables have a long-term association, but only in Nigeria and not in Coted'iviore. indicating that there is a long-term inverse link between Nigeria's population increase and economic growth rate.

Using ordinary least squares regression analysis, Afzal (2009) from Pakistan also looked at population growth and economic development in Pakistan from 1981 to 2005. The outcome demonstrates a highly substantial negative relationship between population expansion and development and economic growth. However, the findings of Gideon, Gachanja, and Obere's (2013) study on the relationship between population growth and economic growth in Kenya showed that the two variables are positively correlated, meaning that an increase in population will have a positive effect on the nation's economic growth. They utilized yearly time series data covering the years 1963 to 2009 using the Vector Auto Regression estimate approach.

Furthermore, Adewale (2012) used the ordinary least square technique of analysis to look at how Nigeria's population growth affected the country's economic performance between 1981 and 2007. The findings showed that population expansion significantly and favorably influences economic growth. Similar assessments of the relationship between population increase and economic growth in Nigeria from 1980 to 2010 were made by Tartiyus, Dauda, and Peter (2015). Descriptive statistics and regression analysis were used to examine the data. The findings showed that population increase and economic growth are positively correlated.

The dynamics of a nation's population have a significant impact on its saving rate. Nigeria's population expansion causes a significant bulge in the age pyramid's bottom part, which raises the proportion of young dependents. This shows that the nation is paying a heavy price for its rapid population increase, which lowers the saving rate and, as a result, slows economic expansion. In light of this, scholars have conducted studies on savings and economic growth, which are discussed below.

2.3.2 Savings and Economic Development

The issue of low savings and capital accumulation as it relates to economic growth was addressed by Osundina & Osundina (2015) in their paper "capital accumulation, savings and economic growth of a nation-evidence from Nigeria." Its scope was based on data spanning thirty-three years (1980-2012). The variables in the model were inflation, real gross domestic product, savings deposit rate, gross national savings, and gross fixed capital creation. Multiple regression analysis was used to analyze the data. A 22% rise in savings would be explained by a percentage change in real gross domestic product, according to the data, and there was a positive correlation.

In his analysis of the connection between savings and economic expansion in Kenya, Odhiambo (2008) found that there existed Granger causality between the two variables and that savings was necessary for the financial sector's expansion. Using panel data from 1991 to 2005, the

study sought to determine the causal link between savings, economic growth, and the fiscal deficit. His work stood out from earlier studies of this kind because he placed a strong emphasis on two-way causation.

The direction of the causal link between savings and economic growth in Nigeria between 1970 and 2006 was examined by Olajide & Oladipo (2009) using the Toda and Yamamoto technique. The results showed a unidirectional causal association between savings and economic growth. However, the study's findings differed from those of previous research in this field; Nuruden (2010) discovered a causal relationship between economic growth and saving, suggesting that saving is caused by Granger and economic growth comes first. According to Adeleke (2014), there is a reciprocal relationship between savings and economic growth in Nigeria.

Using a vector error correction model, Anorou & Ahmad (2001) examined the connection between savings and economic growth in seven African nations: Congo, Cote d'Ivoire, Ghana, Kenya, Nigeria, South Africa, and Zambia. The outcome suggested that savings and economic growth had a long-term link. Additionally, they discovered that there is bidirectional causality in South Africa and Cote d'Ivoire and that savings granger drives growth in the Congo.

Romm (2005) examined the link between savings and growth in South Africa using the Johansen VECM estimating approach. The study found that the private savings rate influences economic growth both directly and indirectly. Sinha & Sinha (1998) used multivariate Granger causality tests and multivariate co-integration tests to investigate the link between savings and economic development for Mexico between 1960 and 1996. The findings showed that savings and economic growth had a long-term favorable correlation.

Masih and Peters (2010) conducted more current research in which they used generalized variance decomposition analysis, Toda and Yamamoto causality techniques, and the Johansen co-integration methodology to reexamine the savings-growth nexus in Mexico as it converged between 1960 and 1966. They discovered unmistakable proof of a long-term feedback link between economic development and public savings. Tang & Chau (2009) used the OLS technique and a nonparametric co-integration test to perform a study on the link between savings and growth in Malaysia. The study reveals that saves is an engine of economic growth through its influence on capital creation. It concluded that savings and economic growth are co-integrated and favorably associated in the long term.

Seng & Sothan (2014) looked at the relationship between domestic savings and economic development in the context of Cambodia. The study found that GDS and economic growth in Cambodia are independent of one another since it could not identify any causal relationships between GDS and growth or growth and GDS. Mphuka (2010) used the bivariate vector auto-regression (VAR) estimation approach to examine the causal relationship between savings and economic development in Zambia. The test revealed that savings are a direct cause of economic growth, despite the article's contention that savings may have an indirect effect because they lead to capital accumulation and the infusion of developed-nation technologies—which, in actuality, are essential to economic growth.

2.3.3 Relationship Between Population Dynamics and Savings

Savings is a crucial and essential component of economic expansion. This is due to its favorable link with investment levels, which in turn leads to economic expansion and growth. Numerous factors have been found in the literature to affect savings, and demographic and population characteristics are one of these key aspects. Scholars have vigorously debated the impact of population dynamics on economic aggregates, and the theory that a big and growing population will boost consumption at the expense of savings has a storied history. However, Leff (1969)

was the one who provided solid empirical support for this claim. He looked into how savings were affected by dependence ratios and population increase. His research is grounded in the Ando and Modigliani life cycle theory, which links savings to demographic variables and takes into account effects on households and the economy. He contends that total savings are reliant on the savings of the working population today and the dissaving of dependents, or the young and retired population of today. He distinguished between two effects of population expansion on savings: growth effects and dependence effects. According to the dependency effect, a high dependence ratio and poor saving are the results of the dependent population growing faster than the working population. However, the growth impact shows that when the working population surpasses the population that is dependent and does not save, the population expansion increases overall growth and saving. He came to the conclusion that although savings and the reliance effect are negatively correlated, there appears to be a positive correlation between the two. However, Goldberger's (1973) evidence contradicts Leff's (1969) reliance hypothesis. Goldberger (1973) argues that the empirical findings on savings and dependence rates published by Leff (1969) are implausible. He maintained that the fundamental information Leff created was inherently contradictory for every nation under investigation. He discovered that the product of the savings ratio and per capita income and per capita savings differ significantly. Regarding the empirical literature on demography and saving, Deaton (1992, Pp. 51) made the following assessment: "although some studies find an influence of population growth or demographic effects, the results are typically not robust and there is no consensus on the direction of the effect on saving."

Further evidence that demographic change affects aggregate saving comes from more recent empirical investigations (Mason, 1988; Fry and Mason, 1982; Higgins, 1994 and 1998; Blanchet, 1991). According to Fry and Mason (1982), young workers' wages are higher than pensioners' incomes who may be using their savings in nations experiencing strong economic expansion. If this is the case, a higher level of overall family and national saving would result from the workers' concentrated earnings. Mason (1988) created a model known as the "variable rate-of-growth effect" in an attempt to connect teenage dependence ratios with national saving rates. He discovered strong empirical evidence for the model, demonstrating a negative association between young reliance, income growth, and savings, by using cross-section data for seven Asian emerging nations. This is consistent with the argument made by Coale and Hoover (1958) that high rates of teenage reliance would make it more difficult for a nation to save enough money for growth. Deaton and Paxson (1997) state that micro-level studies provide little evidence for a significant relationship between saving and population. They contended that although age variation is small enough to have little or no effect on overall saving, changes in age structure do affect household saving rates. Instead, they are influenced by the demographics of the family. According to Weil's (1993) research, a 1% shift in population from the working to the senior age groups would result in a 0.81% decrease in the nation's savings. While juvenile dependency and overall reliance ratios show no significant influence, Callen and Thimann (1997) revealed that the elderly dependency ratio has a negative and substantial connection with savings. The total dependence ratio finding runs counter to Leff's (1969) proposal.

Nigeria's population has more than quadrupled since 1960, according to an analysis of demographic statistics in the country. Nigeria has a population of approximately 140 million as per the findings of the 2006 census, with a projected annual growth rate of more than 3 percent. The ability of the economy to develop proportionately and sustainably may be more indicative of the situation than the population's absolute size. It follows that the pace of population growth in Nigeria is unsustainable and has an impact on macroeconomic variables and performance both directly and indirectly. In spite of this, scholars haven't done much to look at the relationship between Nigeria's macroeconomic performance and population demographics.

Therefore, using data from Nigeria, econometric examination of the impact of population dynamics on savings is required.

Evaluation of empirical literature review and values added.

A shifting age structure brought on by variations in population growth may be used to characterize the demographic transition that nations experience. The impacts of the demographic transition are disregarded by standard neoclassical growth theory, which assumes a steady rate of population growth. Furthermore, the majority of research have a strong bias towards population dynamics and growth in emerging nations. Despite the fact that emerging nations share many objectives and issues, it is risky and insufficient to draw too many generalizations about them due to their diverse topography, resource depletion, historical and colonial past, and political, social, and cultural systems. In order to synthesize the experiences of all emerging nations, it is crucial to identify shared features that might not actually exist. Thus, the emphasis of this study is Nigeria. The literature evaluated by different academics has acknowledged population dynamics and savings as distinct units in the process of economic growth, as evidenced by the preceding information. However, the prior studies did not take into account population dynamics, savings, or economic progress, which is why this research is crucial.

3. RESEARCH METHODOLOGY

According to Esene (2005), who quoted Yomere and Agbonigho (1999), research methodology is the set of techniques, protocols, or strategies the researcher plans to use to achieve his goals. As a result, a summary of the data collecting procedure and the statistical method used to verify the validity of the previously developed hypotheses are also included in this chapter. An ex-post facto research design is used in this paper. Osuagwu (1999) defined ex-post facto research design as the kind of study that involves events that have already happened. Since no effort is taken to regulate or modify pertinent independent factors, data are already available. Data from annual time series covering the years 1980–2020 are utilized in the analysis. Inflation rate (INFL), net migration (NR), birth rate (BR), death rate (DR), savings rate (SR), and human development index (HDI) are among the factors. The sources of all data were CBN, 2020 and WDI, 2020. ARDL is the estimating approach method. Two models were created for the examination.

3.1 Model specification

The model for this work anchors on theories of demographic transition and life cycle hypothesis to explain the relationship between population dynamics, savings and economic development.

Model 1:

HDI= f(Population dynamics, Savings)

Where Population Dynamics is proxy by birthrate, death rate and Net- migration.
Savings= savings rate.

HDI=F(BR+DR+NM+SR+INFR)……Eqn (1)
The econometric model can be mathematically written as
$HDI=\beta_0 + \beta_1 BRt + \beta_2 DR + \beta_3 NM + \beta_4 SR + \beta_5 INFR + \mu_1$……Eqn(2)
The ARDL representation of eqn (3) is specified as:

$$\Delta HDI=\beta_0 \quad \sum_{i=1}^{n}\beta_1\Delta HDI_{t-1}+\sum_{i=1}^{n}\beta_2\Delta BR_{t-1}+\sum_{i=1}^{n}\beta_3\Delta DR_{t-1}+\sum_{i=1}^{n}\beta_4\Delta NM_{t-1}+\sum_{i=1}^{n}\beta_5\Delta INFLR_{t-1}$$

$+\beta_1 BR_t+\beta_2 DR_t+\beta_3 NM_t+\beta_4 SR_t+\beta_5 INFLR_t+\mu_1$……Eqn(3)

Equation (3) is derived from Eqn (2) and the interpretation of each variable remains the same Δ denotes the first difference operator.

Model 2:

SR= f(Population dynamics)

Where, Population dynamics is proxy by birthrate, death rate and Net-migration.

SR = F(BR+DR+ NM)……Eqn(1)

The econometric model can be mathematically written as:

$SR = \beta_0 + \beta_1 BRt + \beta_2 DR + \beta_3 NM + \mu_1$……..…….Eqn(2)

The ARDL representation of eqn(3) is specified as:

$$\Delta SR= \sum_{i=1}^{n}\beta_1\Delta SR_{t-1}+\sum_{i=1}^{n}\beta_2\Delta BR_{t-1}+\sum_{i=1}^{n}\beta_3\Delta DR_{t-1}+\sum_{i=1}^{n}\beta_4\Delta NM_{t-1}$$

$+\beta_1 BR_t+\beta_2 DR_t+\beta_3 NM$… …….Eqn(3)

Equation (3) is derived from Eqn(2) and the interpretation of each variable remains the same Δ denotes the first difference operator.

4.1 Data Presentation

Because secondary data were utilized in the study, a unit root test must be performed on the data in order to prevent erroneous regression. Appendix 1 contains the data utilized for this investigation. In the interim, more econometric tests will be conducted, as shown below:

4.2: Augmented Dickey Fuller Unit Root Test.

The ADF stationary test is used to test for the stationarity of the variable used for this study.

Table 4.2: Augmented Dickey Fuller Unit Root Test Result

Thus, Table 4.2 show results for ADF Unit root test result.

Variables	ADF T Statistics	Critical value (0.05)	P-value	Order of Integration	Remarks
HDI	-2.613379	-3.526609	0.2768	1(0)	not stationary
D(HDI)	-.6.165139	-3.536601	0.0001	1(1)	Stationary
BR	-1.888249	-3.529758	0.6415	1(0)	Not stationary
D(BR)	-1.392098	-3.529758	0.8477	1(1)	Not stationary
DR	-2.602648	-3.529758	0.2813	1(0)	Not stationary
D(D R)	-2.236967	-3.529758	0.4568	1(1)	Not stationary
NM	-5.182593	-3.529758	0.0007	1(0)	Stationary
D(NM)	-3.736244	-3.529758	0.0315	1(1)	Stationary
SR	-1.539171	-3.526609	0.7988	1(0)	Not stationary
D(SR)	-4.808734	-3.529758	0.0021	1(1)	Stationary
INFLR	-3.772319	-3.529758	0.0290	1(0)	Stationary
D(INFLR)	-5.830890	-3.529758	0.0001	1(1)	Stationary

Source: Authors computation 2022.

Since these variables were found not to be stationary using ADF, the PPT was used to check the stationarity. Table 4.2 above demonstrates that NM, INFLR were stationary at level and first difference, HDI, SR were not stationary at level but stationary at first difference, and BR, DR were not stationary at level and first difference.

4.3: Unit Root Test using Phillip Perron.

Since the ADF test suggests that some of the variables were not stationary even at first difference, the Phillips Perron test was used to determine if the variable was stationary.

Table4.3: Test of stationarity: Philip-Perron Unit Root Test

Variables	Ppt T Statistics	Critical value (0.05)	P-value	Order of Integration	Remarks
HDI	-2.373676	-3.526609	0.3870	1(0)	not stationary
D(HDI)	-14.23392	-3.529758	0.000	1(1)	Stationary
BR	-4.995697	-1.949319	0.0000	1(0)	Stationary
D(BR)	0.196710	-1.949609	0.7380	1(1)	Not stationary
DR	-3.354219	-1.949319	0.0013	1(0)	Stationary
D(DR)	-1.062832	-1.949609	0.2551	1(1)	Not stationary
NM	-4.197218	-3.526609	0.0102	1(0)	Stationary
D(NM)	-4.142809	-3.529758	0.0119	1(1)	Stationary
SR	-1.641189	-3.526609	0.7583	1(0)	Not stationary
D(SR)	-4.598545	-3.529758	0.0037	1(1)	Stationary
INFLR	-3.044238	-3.526609	0.1335	1(0)	Not Stationary
D(INFLR)	11.98970	-3.529758	0.0000	1(1)	Stationary

Source: Authors computation 2022.

It is evident from the above result in table 4.3 that the HDI is stationary at the first difference, the BR and DR are motionless at the level as well, and the NM, SR, and INFLR are stationary at the first difference. It is evident from the above result in table 4.3 that none of the variable's probability values are more than the 5% level of significance. As a result, we conclude that the variables under investigation are stationary at the 5% level of significance and reject the null hypothesis in every case. This suggests that the data is trustworthy enough for more examination. This suggests that the variable is likely to have a long-term association due to the stationary character of the data.

4.4 Lag Selection Criteria

The lag selection criteria are used to select the appropriate lag for the ARDL model estimation

Table 4.4 Lag Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-192.6028	NA	0.022614	10.40015	10.61562	10.47681
1	-8.270240	310.4548	5.23e-06	2.014223	3.307054	2.474203
2	38.03334	65.79983*	1.83e-06*	0.892982*	3.263173*	1.736278*

From the table above, the LR, FPE, AIC, SC, HQ selected 2 lag. This research work adopted 2 lag selection from the AIC criteria.

4.5. Presentation of Results For: MODEL 1

Table 4.5. Estimated Short run coefficients using ARDL Approach

Variables	Coefficient	T-Statistic	Probability
Dr	-0.027943	-5.221684	0.0000
Br	-0.012633	-0.455338	0.6523
Nm	0.004295	0.697096	0.4913
Sr	-0.003768	-2.945911	0.0063
Inflr	-7.15e-05	-0.777008	0.4434
C	0.859336	5.252557	0.0000
R-Squared = 0.985007			
Ajusted R–Squared = 0.980354			
F- Statistics = 211.6942 (0.000000)			
Durbin- Watson Stat = 2.460881			

Source: Author Computation 2022.

The following result shows a significant positive link between the variables (HDI, BR, DR, NM, SR, and INFLR) with a high coefficient of determination (Adjusted R-squared = 0.98035). According to the R-squared value, birthrate (BR), deathrate (DR), net migration (NM), savings rate (SR), and inflation rate (INFLR) collectively account for almost 98% of the fluctuations in the Human Development Index (HDI). The model appears to be suitable for usage based on the values of the R-squared and the Adjusted R-squared.

The birthrate result showed that, when examining the t-statistics of -0.455338 (less than 2 in absolute term) and its related P-value of 0.6523 (which is more than 0.05), the coefficient of this variable (-0.012633) is negative and statistically insignificant. It suggests that the birthrate and economic development in Nigeria are negatively correlated, meaning that a 1% rise in the birthrate would often result in a 1% decrease in economic growth. This is consistent with economic theories like the Malthusian hypothesis. The outcomes of Aidi, Emecheta, Ngwudiobu, and Ikenna (2016) are consistent with this conclusion.

For the duration of this analysis, there is a statistically significant negative correlation between DR and economic progress in Nigeria. This finding, however, is consistent with the research on Nigeria's death rate and economic growth conducted by Ishaku (2019). According to his research, Nigeria's economic progress has been significantly impacted by DR. According to economic theory, a higher mortality rate would result in a smaller labor force, which would lower productivity.

Furthermore, it was shown that net-migration is a statistically unimportant variable in the analysis of economic development based on the Net-migration coefficient, t-statistics, and P-value of 0.004295, 0.697096, and 0.4913, respectively. It is also crucial to remember that the variable's direct relationship to Nigeria's economic progress is explained by the positive coefficient, as shown. Thus, assuming all other factors remain constant, an average rise of 0.04% is predicted in economic development for every 1% change in net-migration. This stands in stark contrast to the findings of Aidi, Emecheta, Ngwudiobu, and Ikenna (2016) and apriori expectation. This might indicate that there is no economic benefit to the amount of people leaving the nation.

Additionally, as can be seen in the above table, the coefficient of savings is -0.003768; the corresponding t-statistics and P-value are 0.0063 and -2.945911, respectively. With all other variables held constant or unaltered, a percentage change in savings is predicted to reduce the dependent variable (HDI) by around 0.004 percent (on average) since this variable is statistically significant (based on both the t-statistics and P-value). This is consistent with Nwakeze and Omoju's (2011) findings.

It is discovered that the inflation rate has a negative correlation with the dependent variable (HDI) and is statistically significant. The values of the coefficient, t-statistics, and P-value are, respectively, -7.15E-05, -0.777008, and 0.4434. The outcome explains why an average increase in the inflation rate is predicted to decrease economic progress by around 7.15%. This is in line with economic theory as rising inflation rates should have a negative impact on the economy. It is also consistent with research done in 2015 by Osundina & Osundina on "capital accumulation, savings, and economic growth of a nation-evidence from Nigeria."

4.6. Estimated Long run coefficients using ARDL Approach

Table 4.6. Estimated Long run coefficients using ARDL Approach

Variables	Coefficient	T-Statistic	Probability
Dr	-0.020709	-5.419654	0.0000
Br	0.012681	3.031519	0.0051
Nm	-0.001750	-0.457783	0.6505
Sr	-0.002790	-3.135001	0.0039
Inflr	-2.48e-06	-0.040972	0.9676
C	0.243664	1.043769	0.3052

Source: Author Computation 2022.

The estimated ARDL model's Long-Run outcomes are shown in Table 4.6 above. Long-term economic progress in Nigeria is positively correlated with birthrate, despite the short-term results being unfavorable. This indicates that a 1% rise in the birthrate will result in 0.012% more economic development, or the same percentage as in the short term. However, at a smaller proportion of 0.02%, the results indicate that the mortality rate has the same long-term negative and substantial link with economic progress.

Furthermore, there is a negligible long-term negative correlation between net migration and economic development, which is consistent with the economic theory that states that brain drain from net migration has a negative impact on economic development. Likewise, there is a considerable negative correlation between the short-term savings rate and economic progress. Additionally, it has been demonstrated that the inflation rate and economic progress continue to have a negligible negative association.

4.7 F-Bounds Test Result

Table 4.7 F-Bounds Test Result

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	12.28005	10%	2.75	3.79
K	5	5%	3.12	4.25
		2.5%	3.49	4.67
		1%	3.93	5.23

Based on the bound test result, it is evident that there is a long-term link between the variables and HDI since the F-statistic (12.28) is bigger than the upper and lower bound test critical values (4.25 and 3.12, respectively).

4.8. Presentation of Results for Model 2:

Table 4.8.1 Estimated Short run coefficients using ARDL Approach

Variables	Coefficient	T-Statistic	Probability
Dr	3.933441	2.322691	0.0267
Br	1.648296	3.336712	0.0022
Nm	1.242312	1.548270	0.1314
C	-18.64224	-1.780768	0.0844
R-Squared = 0.936947			
Ajusted R–Squared = 0.925124			
F-Statistics =79.25128 (0.00000)			
Durbin –Watson Stat =2.178657			

Source: Author Computation 2022.

A significant positive link between the variables (BR, DR, NM, and SR) is shown by the high coefficient of determination (R-squared = 0.936947, Adjusted R-squared = 0.925124) in the

given result. According to the R-squared value, net migration (NM), birthrate (BR), and deathrate (DR) collectively account for over 93% of the fluctuations in savings rate (SR). The model appears to be suitable for usage based on the values of the R-squared and the Adjusted R-squared.

In the examination of savings rate, the birthrate is a positive and statistically significant proxy variable for population dynamics, as indicated by the birthrate coefficient, t-statistics, and P-value of 1.648296, 3.336712, and 0.0022, respectively. Nigeria. Therefore, an average rise in SR of 1.65% is predicted for every 1% increase in the birthrate.

The study of savings rate also demonstrated that deathrate is a statistically significant proxy variable for population dynamics, as indicated by the deathrate coefficient, t-statistics, and P-value of 3.933441, 2.322691, and 0.0267, respectively. It's also important to remember that the variable's direct relationship to Nigeria's savings rate is explained by the positive coefficient, as shown. Therefore, if all other factors remain constant, an average rise in SR of 3.93% is predicted for every 1% increase in the mortality rate.

In the examination of savings rate, net-migration is a statistically insignificant proxy variable for population dynamics, according to the Net-migration coefficient, t-statistics, and P-value of 1.242312, 1.548270, and 0.1314, respectively. It's also important to remember that the variable's direct relationship to Nigeria's savings rate is explained by the positive coefficient, as shown. Therefore, assuming that all other factors remain constant, an average rise of 1.24% in SR is anticipated for every 1% increase in net-migration. This is consistent with economic theory, which holds that migrants who leave their home country in quest of a better life contribute to their economic reserve through unilateral transfers.

Table 4.9. Estimated Long run coefficients using ARDL Approach

Variables	Coefficient	T-Statistic	Probability
Dr	-3.231741	-7.682828	0.0001
Br	2.015421	4.556188	0.0000
Nm	1.519013	1.711703	0.0966
C	-22.794440	-1.926829	0.0629

Source: Author Computation 2022.

The ARDL Model's long-term estimation is shown in Table 4.9.2 above. A key indicator of population dynamics that negatively affect SR is the deathrate.

In Nigeria, birthrate and net migration continue to have an influence on SR over time, with BR being substantial and NM being inconsequential at the 5% significance level.

4.10 F-Bounds Test Result
Table 4.10 F-Bounds Test Result

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	6.985971	10%	2.72	3.79
K	3	5%	3.23	4.25
		2.5%	3.49	4.67
		1%	3.93	5.23

According to the bound test result, there is a long-term association between the variables and SR since the F-statistic (6.985971), which is bigger than the upper and lower bound test critical values (4.25 and 3.23, respectively), indicates this.

4.11 Test of Hypothesis

Decision rule: In testing our hypothesis, we reject the null hypothesis if the probability value is less than the 5% level of significance otherwise; we fail to reject the null hypothesis.

Objective 1: Evaluate the effect of population dynamics on Economic development in Nigeria.

Null Hypothesis: Population dynamics has no significant effect on economic development.
Interpretation
We therefore accept the null hypothesis, which states that population dynamics has no significant effect on economic development in Nigeria at the 5% level of significance, based on the results in table 4.5.1 above, which show that the probability values of birthrate (0.6532) and net-migration (0.4913) are greater than the 5% level of significance.

Objective 2: Assess the impact of saving on economic development in Nigeria.

Null Hypothesis: Savings do not have significant impact on economic development in Nigeria
Interpretation
Based on the outcome presented in Table 4.5.1 above, the probability value of the savings rate (0.0063) is less significant at the 5% level. This suggests that we accept the alternative hypothesis and reject the null hypothesis, which claims that savings have no substantial effect on economic growth. As a result, we find that savings have a considerable impact on economic development in Nigeria.

4.12: Discussion Of Findings

The population dynamics, savings rates, and economic development of Nigeria are all empirically examined in this paper. The findings indicate a short- and long-term link between savings, economic development, and population dynamics. Additionally, the study's findings indicate that, during the duration of the investigation, Nigeria's economic development is negatively impacted by population dynamics, both in the short and long terms. On the other hand, the adverse impact is negligible in the near term but substantial in the long term. This is consistent with proxies for population dynamics being shown to be negatively associated to economic growth in Aidi, Emecheta, Ngwudiobu, and Ikenna's (2016) study on population dynamics and economic growth. Furthermore, the demographic transition hypothesis demonstrates how a country's development is impacted by its population dynamics.

The study's conclusions also showed that, throughout the study period, Nigeria's savings rate had a considerable detrimental short- and long-term influence on the country's economic development. This likely demonstrates that a portion of the GDP saved in this economy is so low that it slows down the rate of economic development, which is consistent with the finding of Igbatayo & Agbada (2012) that higher levels of national savings encourage higher levels of investment, which in turn boost output.

The findings also showed that, over the long and short terms, population dynamics and savings in Nigeria had a positive and substantial association. which has resulted in the null hypothesis—that there is no relationship between population dynamics and savings in Nigeria—being rejected. This is consistent with the lifecycle theory, which examines the relationship between population dynamism and savings rate, as well as the study by Leff (1969), which examined

the effects of population growth and dependency ratio on savings and found that rising populations have an impact on savings.

5.1 Summary of Findings

The demographic dynamics and savings on Nigeria's economic development between 1980 and 2020 were examined in this study. ADF results indicate that the variables were not found to be stationary using ADF, which led to the use of the Phillip Perron test, where BR& DR became stationary at level. NM, INFLR, HDI, and SR were not stationary at level but stationary at first difference, and BR and DR were not stationary at level and first difference. The results of the Bound test showed that the variables had a long-term association. The results showed that measures of population dynamics are negatively correlated with economic development; the amount of GDP saved in this economy has an adverse effect on economic development; and there is a substantial positive correlation, both in the short and long term, between population dynamics and savings.

5.2 Conclusion and Recommendations

The researcher in this study attempted to determine the relationship between population dynamics, savings, and economic development in Nigeria due to the government's inability to control the country's rapidly expanding population and enhance capital formation for economic development. These results suggest, among other things, that Nigeria has a low savings rate because the country has not been able to capitalize on its large population to increase productivity and the labor force. Based on the results, it is sufficient to draw the conclusion that the Nigerian government needs to make investments in the development of human capital, as this will inevitably increase capital formation and, eventually, lead to national development. In light of the study's conclusions, the following policies were recommended:

1. The Nigerian government ought to start sensitization campaigns to inform the people of Nigeria about the importance of monitoring the country's fertility rate.
2. The Nigerian government ought to make investments in human resource planning and manpower, as these are the primary sources of a country's wealth.
3. A renewed interest in mobilizing domestic resources to finance savings and economic development is necessary because capital accumulation is crucial for the growth and development of a nation. Particular attention should be paid to economic and socio-cultural shocks specifically, the investment climate in Nigeria so as to ensure macroeconomic stability and economic development.
4. The government should put in place more economically friendly policies to attract more of both domestic and foreign investors. This will go a long way in creating more employment opportunities as well as stimulating productivity thereby boosting the part of GDP that is saved.

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