

POPULATION AGE STRUCTURE AND HOUSEHOLD SAVINGS IN NIGERIA (1980-2013)

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Abstract

Nigeria population has grown momentum, even if the population growth rate were reduced to the barest replacement level; the population will still be high as a result of high fertility rate and the population age structure of the nation which concentrate mostly on young population. New entrants to the working age group have great production potentials known as demographic dividend which can adequately enhance economic growth and development in the nearest future. However, this also poses a great challenge in the face of the country's economy which has grossly underperformed relatively to her enormous resource endowment in the face of high level of unemployment. This paper evaluates the consequences of population age structure on economic development using data from 1980-2013 with focus on savings as a component of development. The trend and pattern of different age structures in the population over the past years were examined. Statistical result indicated that the high dependency ratio of the nation retards savings. Hence, there is need for viable and strong policies to control explosive fertility rate in the country.

Keywords: Population, age structure, savings, development, Nigeria

INTRODUCTION

One of the most important challenges for the nearest future is the growth of the human population. Generally, the numbers of people inhabiting the planet has influence on the size, growth and fundamental developmental processes of life. For decades, the population of the World has been undergoing continuous growth which is more prominent in developing nations than the developed ones. The gap between the developed and the developing countries is continually widening, a large majority of the world's population in developing countries lives in a

state of poverty. Developing nations are faced with an unprecedented rise in population growth coupled with high levels of poverty (UNFPA, 2009).

Issues related to problem of urban population growth, unemployment, growing inequalities and rural stagnation are hindrances to growth and development in less developed countries. In recent time, the growth of population in developing countries has built momentum as a result of the magnitude of people within the reproductive ages. This occurrence tends to increase the experience of disastrous consequences of extreme poverty, widespread of diseases and unemployment coupled with high degree of socio-economic tensions if current explosive population growth is not checked.

The total concern on population growth focused on concerns for overpopulation and its havoc on a nation's economy. Nigeria poverty rates have been on the increase for a long period of time. Rapid population growth and poverty nexus is complex. The high prevalence of poverty incidence in Nigeria is presumed to be the root cause of unrest and social upheavals in the country. Increasing population momentum and diminishing facilities means that poverty and socio-economic problems will continue to override in Nigeria's development landscapes even in decades to come (Eneh, 2011). Most studies on poverty in Nigeria confirm that poverty in Nigeria is on the increase. Garba (2006) compared per capita income of \$290 to that of the worlds in 2003 and classified the country as one of the poorest in the world. While Nigeria ranked 156th out of 187 countries in the world ranking of nations using the Human development index, among OPEC members, Nigeria ranked 1st in low human development (UNDP, 2011).

The life cycle savings model hypothesis (Ando and Modigliani, 1963; Fry and Mason, 1982) reflects the behaviour of people relatively to their age and phase of life. This showcase the saving drive of the populace during their productive years largely depends on their dependants. A lower youth dependency burden increases savings. Given these scenario, it is essential to examine the role of Nigerians population age structure on household's savings potential.

The significance of this study lies in its ability to showcase the extent at which population growth has affected Nigerians with the objective of assessing the impact of population age structure on savings in Nigeria.

This introductory part is followed by section two which captures a brief stylized fact on Nigerian population age structure, economic development strategies and brief empirical literature. Section three captures the research method while section four and five presented the discussion of result and the conclusion of the paper.

LITERATURE REVIEW

Stylized Fact on Nigeria Population Age Structure

Nigeria, the 8th most populous nation in the World and Africa's most populous nation with population estimates of up to 174 million people and an annual population growth rate of 2.8 percent (World Bank, 2013) is passing through a phase of unprecedented demographic changes which is envisaged to increase the size of the labour force. The population census of 2006 in the nation recorded a population of about 140 million and this has increased to an estimated 173 million people in year 2013 according to the World Bank report. The increasingly high population pattern of the nation has made her the most populated in Africa and the black nations of the world. A projection into the future trend revealed that if unchecked, the population will continue to soar rapidly. The continuous upward trend revealed that the population control measure in the country has not shown adequate progress in controlling the growth of population.

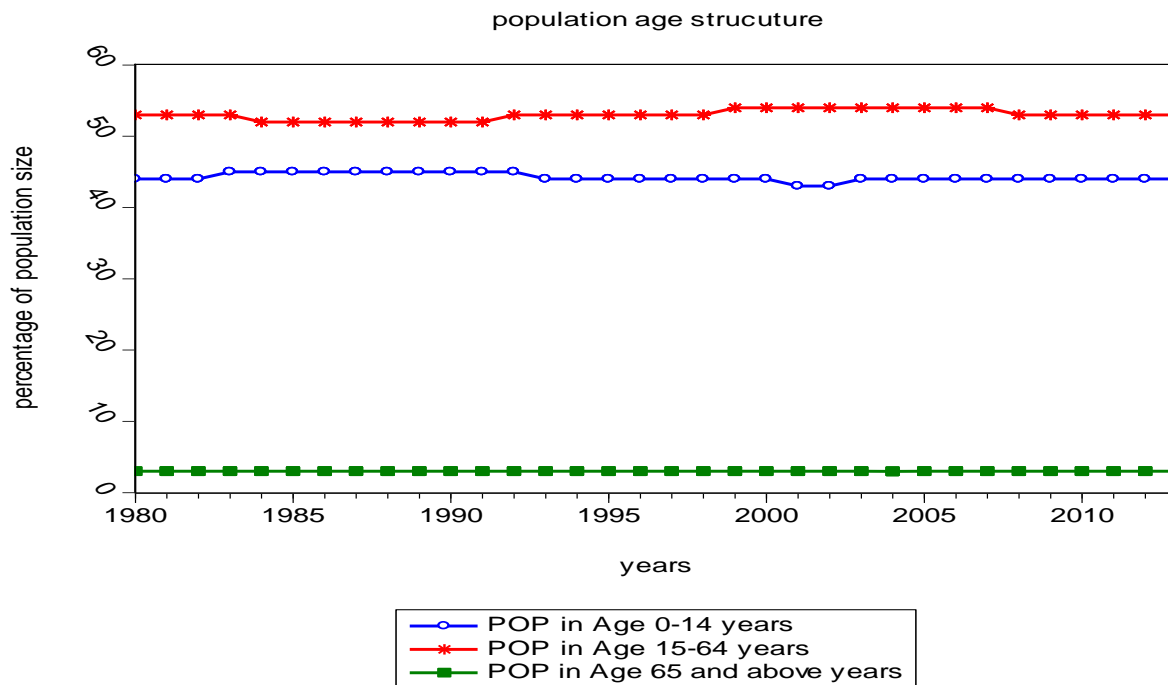
Components of population size and the determinant of its momentum is the pattern of its age structure. This indicates the number of people in a particular age. The component of Nigeria's population size is structured relatively to the age components of the people in the nation. A close look at the nation's population age structure revealed that the aged whose age falls above 65+ took only 3% of the population while those in the 0-14 are 44% with those in 15-64 sharing 53% of the population. This is an indication that the proportion of those in the child bearing age is high while those aged with no hope of reproduction are low. An indication of high population momentum abound as people respond to the nation high fertility rate. An implication of a dividend is seen in the capability of labours through the population in age 15-60 whom can be regarded as a large labour market for the country, an attainment of the dividend depends on the creation of jobs for the people in the working age proportion. Nigeria total dependency ratio as at 2014 is 89% with the youth dependency ration being 84% with the aged taking 5%. The implication of this is that the dependant per family is higher than the working population, thereby making it difficult for a family to adequately save.

Economic Development Strategies in Nigeria

Economic development which had been the goal most Third World countries seek has been an astonishing topic over the last decade, its achievement have generated the formulations of many strategies. Nigeria government had over time embarked upon numerous developmental programmes, policies, projects and plans such as; the Structural Adjustment Programmes (SAP 1986), the national development plans, the Vision 2010, the Economic Empowerments Development Strategy 2004 at both national and state levels (NEEDs, SEEDs), the 7-point

agenda for national development of 2007, Vision 20: 2020 and the transformation agenda centrally in the quest to guarantee economic development and to improve the welfare and the well-being of the citizens. Despite all efforts put in place by the various governments into these plausible and laudable programmes, the economy has not actually performed to its fullest potential in the face of its rising population, high corrupt and bureaucratic activities.

Figure 1: Trend of Population Age Structure in Nigeria (1980-2013)



Source: Computed by author using data from World Bank

Empirical Literature

The relationship between population growth and economic development in the world has been a controversial issue which various researchers had contributed some insight into. Barro (2003) on the determinants of economic growth in a panel of different countries found that from cross country panel regression, the differences in per capita growth rates relates systematically to a set of quantifiable explanatory variables such as educational attainment, health issues related to fertility rate. He revealed that given per capita Gdp and human capital, growth depends positively on investment and negatively on fertility rate.

Dawson and Tiffin (1998) used time-series data to analyse a long-run relationship between population growth and economic development in India. Using the Johansen cointegration test of analysis, their study found no long-run equilibrium relationship between the population growth and economic development in India. This means that these pairs of variables

did not seem to move jointly thereby concluding that population growth neither causes per capita income growth nor is caused by it.

Kraay (2000) identified the one-child policy in China which is a way of population control as a vital factor in raising the level of household and aggregate saving in the country. He argued that China's one child policy has contributed dramatically to the decline of the population numbers under the age of 14. As a result of these reforms, the dependency ratio pattern changed. Households can now save more than before and hence increase in their savings.

Similarly, Rosenzweig and Zhang (2009) used the micro study approach to estimate the net effect of an extra child at parities one and two in China, and found that the extra child (an indication of growth in population size) significantly decreases their educational progress and performance and reduce the ability of all children in the family. to assess good health. Both research works affirmed the robust effectiveness of the one –child policy in regulating the age structure of the country and its significant importance.

RESEARCH METHOD

Theoretical Framework

The life cycle savings model hypothesis (Ando and Modigliani, 1963; Fry and Mason, 1982) reflects the behaviour of people relatively to their age and phase of life. the hypothesis shows that population age distribution will affect savings level.(Berg, 1996). The hypothesis clearly shows that individual will have negative rate of savings when in youthful age and positive rate when old and this clearly signifies that the population distribution affect savings rate and potentials.

Model Specification

The equation for the model is built as:

$$HS_t = f(Yt_t, POP_w, YAGE_t, ODED_t, POP_t)$$

Where;

HS_t = household savings, Yt_t = growth rate of real gdp,

POP_w = population within working age, $YAGE_t$ = young age dependency ratio, POP_t = population growth rate,

$ODED_t$ = old age dependency ratio.

Explicitly, this becomes:

$$HS_t = \alpha_0 + \alpha_1 Yt_t + \alpha_2 POP_w + \alpha_3 YAGE_t + \alpha_4 ODED_t + \alpha_5 POP_t + e_t$$

The Data

The time series data used in the study span through the period 1980 to 2013. Data on the population age structure: population within working age (total population between the ages 15 to 64 qualified for joining the labour force population), the young age dependency ratio (the ratio of the dependent people younger than 15 to the working age population), old age dependency ratio (ratio of the dependent people older than 64 to the working age population), population growth rate (change in population as a fraction of the initial population over a unit time period), the growth rate of gross domestic product and the household national saving were sourced from World Bank database and World Development Index .

ANALYSIS AND DISCUSSION OF RESULTS

Table 1: Phillip Perron (PP) Unit Root Test Result (E-View 7 output)

| Variables | AT LEVELS | | | AT 1 ST DIFFERENCE | | | Integration |
|-----------|-----------|--------|--------|-------------------------------|--------|--------|-------------|
| | PP-test | 1% C.V | 5% C.V | PP-test | 1% C.V | 5% C.V | |
| POP_t | -2.7647 | -3.646 | -2.954 | -5.957 | -3.654 | -2.957 | I(1) |
| POP_w | -1.4609 | -3.646 | -2.954 | -5.477 | -3.654 | -2.957 | I(1) |
| $YAGE_t$ | -1.274 | -3.646 | -2.954 | -4.519 | -3.654 | -2.957 | I(1) |
| $ODED_t$ | -5.7895 | -3.646 | -2.954 | NA | NA | NA | I(0) |
| Yt_t | -4.3655 | -3.646 | -2.954 | NA | NA | NA | I(0) |
| HS_t | -4.3109 | -3.646 | -2.954 | NA | NA | NA | I(0) |

The result of the Phillip Perron unit root test (PP test) in table 1 revealed that the household savings rate, the growth rate of the real gdp and the old age dependency rate were stationary at series while the population within the ages in the working population, the youth age dependency rate and the population growth rate were not stationary at series but attained stationarity at first difference. This indicates that the series comprises of variables that are stationary at series and at first difference. Thus, the use of Johansen cointegration technique is not suitable for this, this lead to the use of ARDL which accept variables stationary at different orders of integration. The table 2 reports the result of the ARDL estimates

Table 2: ARDL Short run result

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|-----------|-------------|------------|-------------|--------|
| D(HS(-1)) | 0.289948 | 0.221255 | 1.310469 | 0.2057 |
| C | -1683.88 | 773.2755 | -2.17759 | 0.0422 |
| D(YT) | 0.459736 | 0.252672 | 1.819496 | 0.0846 |

| | | | | |
|-------------|----------|----------|----------|--------|
| D(POPw) | 11.79276 | 5.79558 | 2.034784 | 0.0561 |
| D(ODED) | -29.419 | 45.00247 | -0.65372 | 0.5211 |
| D(YAGE) | -0.25125 | 2.974405 | -0.08447 | 0.9336 |
| D(POPT) | -67.0597 | 35.71021 | -1.87789 | 0.0758 |
| $Yt_t (-1)$ | 0.377274 | 0.32054 | 1.176994 | 0.2537 |
| POPw(-1) | 18.546 | 7.506853 | 2.470542 | 0.0231 |
| ODED(-1) | -28.7903 | 69.81125 | -0.4124 | 0.6847 |
| YAGE(-1) | 8.974369 | 3.09127 | 2.903133 | 0.0091 |
| POPT(-1) | 48.53628 | 19.21937 | 2.525383 | 0.0206 |
| HS(-1) | -1.33622 | 0.291982 | -4.57639 | 0.0002 |

Table 2...

R-squared= 0.67

Table 2 above indicated that the population within the working age group (POPw) exhibits a positive relationship with savings while the population growth, the youth age dependency ratio and the old age dependency ratio has a negative relationship. The implication of this is that savings is promoted by the working group. Dependency ratio increase and the growth of population hamper savings. The result of the estimated coefficients of the long run relationship exhibit that:

$$D\log(HS)_t = -1683.88 + 0.28234YT + 13.8794POPw + 6.71623YAGE - 21.546ODED + 36.3236POPT.$$

This indicates that the annual growth of gdp, the working age population, the young age population and the growth of the population have a positive impact on savings. A one percentage increase in gdp growth increase savings by 0.28 percent, a one percentage increase in population within the working age increase savings by 13.87 percent, a one percentage increase in young age dependency ratio increase savings by 6.7 percent, a one percentage increase in population growth increase savings by 36.32 percent while a one percentage increase in the old age dependency ratio reduces savings by 21.54 percent.

In order to examine the robustness of the model, diagnostic test is implemented using autocorrelation LM test in the model: the result of the LM test revealed that at the 5% level, we cannot reject the null hypothesis that there is no auto correlation in the residuals. Thus, it finds no evidence of model misspecification. The result is presented in the table 3 below:

Table 3: LM test for Autocorrelation

| Lags | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|------|------|------|------|-------|------|------|------|
| Lm | 2.09 | 0.1 | 2.82 | 0.059 | 0.52 | 0.78 | 2.2 |
| Prob | 0.14 | 0.74 | 0.09 | 0.8 | 0.46 | 0.37 | 0.13 |

Testing for the existence of a level relationship among variables in the ARDL model with the use of wald test revealed:

Table 4: Wald Test result

| Test Statistic | Value | Df | Probability |
|----------------|----------|---------|-------------|
| F-statistic | 4.480981 | (6, 19) | 0.0055 |
| Chi-square | 26.88589 | 6 | 0.0002 |

The rule of thumb is that if the computed F-statistics falls below the value of the lower bound, $I(0)$, the null hypothesis (no cointegration) cannot be rejected. If the computed F-statistics exceed the value for the upper bound, $I(1)$, then the null hypothesis (no cointegration) is rejected and thus there is prove of long run relationship. If the computed result falls between the lower and upper bounds, the test is inconclusive.

From the wald test result above, the null hypothesis of no cointegration is rejected since the the critical value 4.480981 is higher than the upper bound critical value (3.61 chosen at 5% error level in the persaran et al.(2001) table C1(iii): unrestricted intercept and no trend.

Table 5: Bound test table for cointegration:

| Critical value | Lower bound value | Upper bound value |
|----------------|-------------------|-------------------|
| 1% | 3.15 | 4.43 |
| 5% | 2.45 | 3.61 |
| 10% | 2.12 | 3.23 |

Table 6: (ARDL) Error Correction Model Results Long run result

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|------------|-------------|--------|
| C | 16.66876 | 4.494762 | 3.708486 | 0.001 |
| D(YT) | 0.12145 | 0.170793 | 0.711096 | 0.4834 |
| D(POPB) | 0.242212 | 4.329218 | 0.055948 | 0.9558 |
| D(ODED) | -10.8168 | 31.81018 | -0.34004 | 0.7366 |
| D(YAGE) | -1.19656 | 2.774669 | -0.43124 | 0.6698 |
| D(POPT) | -42.2038 | 26.24315 | -1.60818 | 0.1199 |
| ECM(-1) | -0.76053 | 0.191556 | -3.97029 | 0.0005 |
| R-squared | 0.504294 | | | |
| Durbin-Watson stat | 1.863665 | | | |
| Prob(F-statistic) | 0.010115 | | | |

Table 6 revealed that the ECM coefficient is -0.76053 and is significant at 1% level with the expected negative sign. This indicates that approximately 76 % of the previous disequilibrium is adjusted in the model. The dependency ratio (old and young) and the growth of the population exhibits a negative relationship with the savings rate in the long run and only the population within the working age is capable of generating a positive relationship with savings.

Considering the results of both short run and the long run relationship between population age structure and savings, there are indications that the ratio of those within the age group 0-15 and above 65 years relatively to the working age population is high, there are indications that most people within the working group can not sufficiently save out of their income considering their large family structure which constitute high dependency ratio. Increasing the population through fertility rate affects the saving propensity through high level of dependants on the working populace. An increase in the population raises the dependency ratio which adversely affects the saving capability of the households who burdens both the youth and aged in the households.

CONCLUSION AND RECOMMENDATIONS

There are strong evidence to support that demographic matter to the pace and progress of economic growth. This research shed light on the fact that the population momentum for Nigeria indicates that for the next couple of decades, the country's population size will still be on the increase. Nigeria demographic opportunity involves the reduction of the household family size through various approaches to promoting fertility reduction which can be done through child spacing and the family planning technique. Lowering of fertility rate is essential for a reduction in the population growth rate which is often raised by a high fertility rate which is relative to the developing nations. Efforts to achieve this involve infant and child survival through improved health. The aged should be encouraged towards working after retirement. Rapid population seems to intensify problems of the less developed nations making prospect for development more remote. The usage of population size must be in line with the utilization of the country's resources.

For Nigeria to improve household savings, this study found out that there it is essential to discourage large family households formed as a result of high fertility rate. It therefore calls for a deliberate manipulation of fertility rate through the elimination or reduction of maternity leaves and benefits, the reduction or elimination of financial incentives or the imposition of financial penalties for having children beyond a certain number in Nigeria. Furthermore, the social and economic status of women should be raised to create favourable conditions for delayed marriage and increased education which can help reduce family pressure for early

marriage. Finally, Nigeria should adopt economic growth strategy that will draw from its youth dominated demographic structure; this will result into a demographic dividend and productive engagement of the youth which characterised her population structure.

WAY FORWARD

This study covers population age structure which is an aspect of population dynamics, it is expected that further studies on population dynamics should cover migration (emigration and immigration) while other components of economic development apart from savings should also be covered by further studies.

REFERENCES

- Barro, R.J. & Sala-i-Martin, X., (2003). *Economic growth*. Cambridge, MIT Press.
- Berg, L. (1996). *Age Distribution, Saving and Consumption in Sweden*. Yale School of Management's Economics Research Network, 1-19.
- Bloom, D. E., Canning, D., & Sevilla, J. (2003). *The demographic dividend: A new perspective on the economic consequences of population change*. Santa Monica, Rand.
- Bloom, D. E., & Williamson, J. G. (1998). *Demographic transitions and economic miracles in emerging Asia*. *World Bank Economic Review* 12(3): 419-455.
- Dawson, D.J., & Tiffin., R. (1998). *Is there a long-run relationship between population growth and living standard? The case of India*. *Journal of Development Studies* 34(5), 149-156. *Development Review* vol. 37, No. 1, pp. 57–87.
- Eneh, C. (2011). *Nigeria's vision 20:2020 - Issues, challenges and implications for development management*. *Asian Journal of Rural Development*, 1: 21-40.
- Fry, M., & Mason, A. (1982). *The variable rate of growth effect in the life cycle model*. *Economic Inquiry* 20, 426-442.
- Garba, A. (2006). *Alleviating poverty in the northern Nigeria*. A paper presented at the annual convention of Zumunta association, Minneapolis, MN, USA.
- Kraay, A. (2000). *Household saving in China*. *World Bank Economic Review*, Vol. 14, No.3. (4): 487-502.
- Modigliani, F., & Ando, A. (1963). *The life cycle hypothesis of saving: Aggregate implications and tests*. *American Economic Review*, 53(1), 55-84.
- Pesaran, M.H., Shin, Y., & Smith, R.J. (2001). *Bounds testing approach to the analysis of long-run relationship*. *Journal of Applied Econometrics* 16, 289-326.
- Rosenzweig, M. R., & Zhang, J. (2009). *Do population control policies induce more human capital investment? "Twins, birth weight and China's 'one-child' policy"*. *Review of Economic Studies*, Vol. 76, Issue 3, pp. 1149-1174.
- UNFPA. *The State of World Population (2011)*. People and possibilities in a world of 7 billion. New York: United Nations.
- World Bank (2013). *World Development Indicators*.