

## Demographic transition, demographic dividend

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### Abstract

*Changes in age structure that results from demographic transition have economic consequences. This paper identifies the period of potential window of opportunity or demographic dividends created by Nigeria's demographic transition. This is done by simulating the period of the demographic window of opportunity in Nigeria. In a simulation covering 1950 – 2050 our results reveal that Nigeria entered the window of opportunity in 2003 and will last beyond year 2050. The highest benefit will accrue in years 2032 and 2033 when the dividend can account for more than 10% of the growth of GDP per capita even if the current performance scenario continues to exist. However, the paper notes that the demographic dividend is not automatically realized and Nigeria needs to embark on strategies that will develop her human capital and position her towards not only capturing the first dividend but the second dividend as well.*

**Keywords:** demographic transition, demographic dividends, national transfer accounts (NTA), economic lifecycle, economic support ratio

### Résumé

*Les changements dans la structure d'âge qui provient de la transition démographique ont des conséquences économiques. Ce papier identifie la période de fenêtre potentielle d'opportunité ou de dividendes démographiques créés par la transition démographique du Nigeria. C'est fait en simulant la période de la fenêtre démographique d'opportunité au Nigeria. Dans une simulation couvrant 1950 – 2050. Nos résultats révèlent que le Nigeria est entré dans la fenêtre d'opportunité en 2003 et durera au-delà de l'année 2050. Le plus haut avantage s'accumulera au cours des années 2032 et 2033 où le dividende peut représenter plus de 10 % de la croissance de PIB par habitant même si le scénario de performance actuel continue à exister. Pourtant, le papier note que le dividende démographique n'est pas automatiquement réalisé et le Nigeria a besoin d'adopter des stratégies qui développeront son capital humain et la positionneront non seulement pour capturer le premier dividende mais le second dividende également.*

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*graphique n'est pas automatiquement réalisé et le Nigeria doit entreprendre des stratégies qui développeront sa capitale humaine et la placeront vers le fait de non capturer seulement le premier dividende, mais le deuxième dividende aussi.*

**Mots clé:** la transition démographique, les dividendes démographiques, les comptes de transfert nationaux (NTA), life cyclé économique, le rapport de soutien économique

## Introduction

Nigeria recently developed and adopted Vision 20-2020<sup>1</sup> aimed at fast-tracking her growth desire over the next ten years and lead the country to become one of the top 20 economies in the world by year 2020. Attainment of this vision requires discerning and annexing various opportunities at the disposal of the country for economic development. While population structure could be an important factor, Nigeria has experienced slow demographic transition. For 40 years after independence, the country experienced high fertility rate with the number of children per woman in excess of 6. This was combined with high mortality rates which resulted in a high ratio of children in the population. The demographic position is changing however with crude birth and death rates as well as fertility rates falling and is expected to continue falling for the next few decades (United Nations, 2007). With declining fertility and mortality, Nigeria like every other country of the world is in the process of demographic transition. As countries move through the demographic transition, size of the working age population mechanically increases (Bloom et al, 2007).

Changes in the age structure of a country can significantly affect its economic performance because individual's

economic behaviour differs at different point in life. The resultant increase in the ratio of the working age population as both fertility and mortality declines yield increases in aggregate income levels thereby creating a window of opportunity, during which economies may benefit from a temporary increase in the working age share of the population (Queiroz and Turra, 2010). The characterizing opportunity associated with this changing population age structure, occurs at different points in time in the history of any nation and is referred to as demographic dividends (Mason et al., 2009).

Recent studies have however focused on the consequences of changes in age structure of population on economic growth and development (Cutler et al, 1990; Bloom, et al, 2010a; Lee and Mason 2011, Lee, and Mason, 2006; Mason, 2005). However, there are limited studies examining this issue for Nigeria . Of paramount interest in this regard is the economic opportunity which changing population age structure offers nations as they experience demographic transition. It has been argued that rapid growth in the proportion of population in working ages contributes to high ratio of effective producers to effective consumers or the economic support ratio. At some stage of the demographic transition,

1. This means that Nigeria hopes to be among the top 20 countries in the world by year 2020

countries experience high economic support ratios and given the growth of productivity, economic support ratio increases growth of per capita income. The period during which growth of economic support ratio leads to increase in economic growth is called first demographic dividend. While the first dividend arises because of the rapid growth of the productive population relative to the consuming population, the second dividend arises because population aging provides a powerful force for saving and asset accumulation.

Nigeria's population has grown extensively in the past years from 88 million in 1991 to 140 million in 2006. This is not unconnected with the rapid development and modernisation which brought about improvements in hygiene and advances in health and education in the country. By 2050, the population of Nigeria is expected to reach 288.7 million (United Nations, 2007). Although crude death rate declined from 24 to 16 between 1990 and 2008, crude birth rate (CBR) has not wit-

nessed the same rapid reduction indicating a rapid population growth in the country as the CBR was is still 40 in 2008 (Table 1). This profile suggests that more people will be entering the working age population in the nearest future. The structure of the population reveals that by 2009, the working age is 43 % of the population and is expected to reach around 58 % by 2050. If this working-age population is totally transformed into educated, skilful and employed, it would be contributory for increasing the national economic growth. An understanding of the economic lifecycle can shape policies in the continent on how to better enjoy the demographic dividend or window of opportunity that the change in population structure will open to Nigeria (Bloom et al, 2010) and prepare the ground on how Nigeria can benefit from the second demographic dividend, through the development of appropriate institutions and provision of the right incentives.

**Table 1** Demographic Indicators for Nigeria

	1970	1990	2008
Crude death rate	24	20	16
Crude birth rate	47	46	40
Life expectancy	40	45	48

Source: UNDP (2009)

Studies such as Renteria et al (2009) and Queros et al (2006) have estimated demographic dividend for Spain and Brazil, respectively using the national Transfer Accounts (NTA) framework with informative policy implications. The NTA approach works through the construction of an age-specific national

economic input-output system (Mason et al, 2010). The accounts allocate consumption and production to single years of age. Thus, they facilitate understanding of how changes in a population's age structure—a product of changes in fertility, mortality, and migration—potentially affect the extent to which there is

a surplus of production over consumption and hence a potential for understanding the structure of life cycle deficits across age groups and how these deficits can be financed.

This paper thus utilises the framework to estimate the economic support ratio and productivity for the country. This is subsequently used to simulate the period of the economic support ratio for Nigeria over the period 1950-2050. This is subsequently used to examine the period when the demographic window of opportunity shall be available to Nigeria. The paper is organized as follows. In the next section we present brief literature review followed by the analytical framework, method and data used for the study. The simulation results and analysis of estimates of the first dividend is presented next. We conclude with a discussion of results, policy options and some limitations of the analysis.

## **Literature review**

Every society continuously experience changes in the age structure of her population. The continuous change is what enables a country to experience demographic transition over time. Demographic transition is the transition from a largely rural agrarian society with high fertility and mortality rates to a predominantly urban industrial society with low fertility and mortality rates (Lee and Mason, 2006). Cutler et al. (1990) pointed out that the changing age-structure has the potential to yield benefits to a society for two reasons. First, it lowers the dependency ratio, which means that more resources can be invested in the economy. Second, the increase in longevity improves the pop-

ulation's savings behaviour, thus creating positive effects on income levels. While most developed countries have largely completed their demographic transition, developing countries are still in the process. Nations which are in the middle part of the demographic transition are potentially in a particularly favourable position to enjoy the demographic dividend as regards the economy, because of the presence of a relatively large working age population.

Many studies including those by Bloom *et al.* (2010a); Kinugasa, (2004); as well as Williamson and Higgins, (2001) Bloom and Canning, (2001) and Bloom and Williamson (1998) have shown the significant effects of these demographic window of opportunity on economic growth. The study by Bloom and Williamson (1998) concluded that about one-third of East Asia's increase in per capita income was due to the demographic dividend while another by Mason (2001) using growth accounting methods estimated that the dividend accounted for about one-fourth of the region's economic growth. Subsequent studies like Cutler *et al.*, 1990; Lee *et al.*, 2003; Lee *et al.*, 2001; Mason, 2005 and Mason (2005) have also found that dividends are important for economic growth in many countries with the potential of contributing as much as one to two percentage points of growth of per capita income for different developed and developing countries. However, despite considerable potentials, many African countries are yet to reap demographic dividends because they are yet to enter the window of opportunity created by the changing age structure of the popula-

tion (see Bloom et al., 2007)

Two phases of the demographic dividends have been identified in the literature (Queroz and Turra, 2010). The first demographic dividend is usually related to a temporary increase in the share of the population that is of working age and can effectively be measured by increase in the ratio of producers to consumers in the population (Mason, 2005; Mason and Feng, 2005)<sup>2</sup>. The second dividend arises to the extent that consumers and policymakers are forward-looking and respond effectively to the demographic changes. This emerges in succession to the first dividend and is related to the creation of wealth that arises in response to population aging (Queiroz, Turra, and Perez, 2006). One feature of the second demographic dividend is that if the window of its opportunity is taken, it turns out to be indefinite. However, the magnitude of its effect depends largely on how wealth is created during the period of first dividend (Mason, 2005). With a rise of the elderly dependent population on the horizon, consumption in the future can be maintained only through the accumulation of wealth in some form. One possibility is that individuals and/or firms and governments acting on behalf of consumers accumulate capital. The second dividend is thus the possible attainment of sustainable development based on accumulation of assets by the elderly that propel economic development.

Soyibo, (2011) found that the pace of demographic dividend differs in the different regions of the Sub-Saharan Africa. While it started first in Southern Africa in the 1970s, followed by Eastern

Africa in the mid eighties, it did not start until the late 1990s and early 2000 in West Africa and Central Africa respectively. If this pace is compared to the countries of South Central and South-east Asia it is observed that demographic transition started later in SSAs as many parts of sub-Saharan Africa have seen almost no decrease in traditionally high fertility rates. The implication is that sub-Saharan Africa has experienced an extremely sluggish demographic transition. Traditionally high fertility rates and large family sizes have persisted in the face of improvements in infant and child mortality. Ross (2004) submits that although Sub-Saharan Africa is just starting to enter its window, if declining fertility rates can be sustained over the next several decades and if respective SSA governments take pro-active actions that follow, to some extent, those of East Asia, the dividends may become real rather than potential. Incidentally, Eastwood and Lipton (2012) submit that in contrast to Asia, there is an alarming implication of continuing high levels of natural increase in SSA population in the face of low savings rates and low capital productivity. This will likely render current consumption per person in most of SSA unsustainable and matters can be made worse if man-made capital cannot readily be substituted for natural capital, or if environmental resources in these countries are progressively degraded(perhaps below a critical threshold) because it is used by more and more people.

While the demographic transition of a society will eventually bring her to this potential, the dividends are neither

2. This ratio is called the economic support ratio (see Mason, 2007)

automatic nor a guarantee for improvement in standard of living (D'Adamo (2004). According to Wongboonsin and Guest (2004) demographic dividend occurs only once during a demographic transition and lasts for just a few decades. The implication is that the opening of the window of opportunity for reaping demographic dividend is transitory as populations age structure will continue to change until when there will be a reduced proportion of working age people and an enlarged proportion of elderly people. This means that countries must exploit while it lasts (Bloom and Canning 2003). While Bongaarts and Bulatao (1999) concluded that Sub-Saharan Africa countries may not likely reap the demographic dividend, Bloom et al (2007) were able to show that most Sub-Saharan countries have the potential to reap the benefits of the demographic dividend, however conditional on presence of solid institutional settings, essential for its realization. These institutions according to Bloom et al (2007) include in a broader sense, infrastructure (health care systems, schooling, roads, transport), and a formal labour market with unions as well as laws protecting both employees and employers

In this regard, it has been acknowledged that the absence of quality institutions will make demographic transition ineffective in realizing the demographic dividend (Lee, Lee, & Mason, 2006; Bloom et al, 2003). For example, Carvalho and Wong, (2005) estimated that the demographic transition of the Brazil will experience this demographic window of opportunity until year 2045 from which the first dividend arises. Turra and Queiroz, (2005)

argue that the temporary benefits of population change in the case of Brazil were mitigated by absence of appropriate policies.

It has been argued by Mason and Lee (2006) that the second component could be influenced by factors such as human and physical capital as well as the strength of political and economic institutions, while for an open economy, income per worker might also be influenced by income earned on assets invested abroad. Bloom et al, (2010b) submits that the rate of adaptation of Nigeria to the changing population age structure in securing high growth might be slowed down if the right policy environment is absent. This conclusion tends to be from past experience as revealed by studies such as Mason (2003) who concludes that "population policies and programmes were a success in East Asia is an inescapable conclusion". Thus the need for policy makers to respond ahead of time in order to boost the benefits of temporary increases in the working age population have been stressed (Carvalho and Wong, 1995). The absence of appropriate policies can inhibit temporary benefits of population changes and heighten unfavourable effects of population aging. It has been projected that Nigeria and a number of other African countries have very strong growth of the share of the working age population, but they still suffer from institutional deficiencies. According to Mason (2005), the ability to reap from demographic dividend must involve a conscious policy effort of creation of adequate opportunities by the labour market for the growing working age population and existence of developed

financial market to fulfil individual's desire to save are fundamental to reaping the benefit of the dividends. This was complemented by Soyibo (2011) that such policies must include employment generation, infrastructural development, health and education policies and programmes that create conducive environment for citizens' empowerment.

Lutz (2008) suggests that SSA countries should follow the steps of the countries that have experienced demographic transition. This is because while high population growth will expand labour force, it will not boost economic growth unless human capital is expanded commensurately. RAND (2002) therefore argues that African countries must act with urgency in implementing policies that will assist in reaping the benefits of demographic dividend as they have a time limited opportunity to capitalize on reduced fertility and the maturing of young populations before this boom generation reaches nonworking age. For Senegal, Dramani and Fahd (2012) found that in order to be able to reap these dividends, they suggest that government needs to make important choices between investment in education, in firms (subsidies), household consumption and many other sectors. For instance, encouraging the firms by fiscal alleviation could allow them to increase their investments, cooperate with the educational system, helping Government and improving in achieving its educational policy.

There are two main analytical approaches in the literature of demographic dividend which are the statistical analysis of aggregate data by Bloom

et al, (2003) and the simulation analysis that has been explored by Lee and Mason (2006) and Mason (2001). While the first approach focuses on estimating growth model using Barro growth framework (conditional convergence). The second uses micro-data based estimates of the age profiles of consumption,  $f(x)$ , and labour earning,  $g(x)$ , to generate the economic support ratio (Dramani and Fahd, 2012). This procedure uses estimates of the effective number of producers and consumers to calculate the economic support ratio of the country. The parameters of specified equations are based on NTA and other empirical research. The direction of the results from both frameworks have generally been the same (Bloom et al, 2010)

## **Data and Methods**

### **Data**

The estimation of the first demographic dividend requires age profile of consumption, labour income and population age distributions for a particular country. These are calculated using the NTA approach (NTA, 2010). In order to calculate the effective number of consumers and producers, we have to construct the age profile of consumption and production of the population in year (Cutler et al. 1990; Mason, 2005) for Nigeria. Here Consumption is defined to include both private and public consumption. Private consumption is estimated from the 2004 National Living Standard Survey (NLSS) of Nigeria using direct estimation of the reported values to get the mean consumption value by age. Public consumption estimates however are based on the total government spending as

reported by the Central Bank of Nigeria (CBN, 2007) as well as other information that were used to allocate public spending on education, health, and other public expenditure. In order to determine the productivity age profile in the country, this study assumes that productivity is reflected by the labour income structure within the country. Labour income estimates are then based on the NLSS survey since it also include adequate information on earnings of individual employees, return to labour in family businesses, self-employed income and other forms of labour income.

The data used in estimating the profiles is the 2004 National Living Standard Survey NLSS as well as some official government statistical documents especially on public health and education expenditure. NLSS was conducted by the Nigerian National Bureau of Statistics and is a nationally representative survey covering 18,000 households and 90,000 individuals. The estimated profiles were adjusted to match the values of the National Income and Products Accounts of Nigeria for 2004 (NBS, 2007). After the base profiles of the consumption and labour income had been determined for year 2004, we then simulate for the period 1950 to 2050. In doing this, the per capita values of consumption and labour income in Nigeria determined from the NLSS data and government records are then used to derive the country estimates by multiplying the per capita value for each age by the population of that age in the different years within our scope (i.e.

1950-2050). The population data for the period of analysis was obtained from UN population projections (United Nations, 2007<sup>3</sup>). Population projections are based on medium variant on total fertility contained in World Population Prospects.

### Method

This study applies the methodology proposed by Mason and Lee (2006) and Mason (2007) to estimate the first dividend for Nigeria from 1950 to 2050, as has been applied in other countries like Brazil (Queiroz et al., 2006) and Spain (Renteria et al, 2010). This paper thus utilizes the NTA approach to estimate the demographic dividend for Nigeria. The NTA approach has two main features in which first, it emphasises consumption rather than income as the outcome variable and second, it provides a new theoretical approach to modelling consumption and capital accumulation. This is done by exploiting estimates of age profiles of consumption and labour income. We follow Mason and Lee (2006) and Mason (2007) to formalize the demographic dividends as expressed in equation 1

$$\frac{Y(t)}{N(t)} = \frac{L(t)}{N(t)} \times \frac{Y(t)}{L(t)} \quad (1)$$

Where

$Y_t$  is the total output,

$L_t$  is effective number of producers, and

$N_t$  is the effective number of consumers.

Equation 1 states that GDP per capita comprises of productivity (GDP per

3. Although we are aware that there are newer estimates of population projection by United Nation, we have utilized 2006 estimates because it is closer to the survey period of the NLSS data which was collected in 2004



worker) and the age structure. The equation further expresses output per effective consumer as equal to output per effective producer and the economic support ratio (i.e. effective producers per effective consumers). The equation can be used to decompose economic growth to reveal the relationship of population growth with GDP per capita growth. We obtain the growth rates of equation 1 by taking the log of both sides of equation 1 and differentiating it in respect with time to give equation 2

$$Y_t = L_t - N_t + Y_t^J \quad (2)$$

Equation 2 reveals that the growth rate of output is equal to the sum of two components, which are the equivalents of the two demographic dividends. The first dividend corresponds to the growth of the economic support ratio. This is the difference between the growth in the number of effective producers and the growth in the number of effective consumers. The second component is the second dividend which is the rate of growth of productivity, and is calculated by the growth of the ratio of income per worker. In the NTA approach, the age profiles of consumption and labour income are calculated for each age in the population to give the age profiles of consumption and labour income. In the period of simulation for the demographic transition and dynamics, the associated economic support ratio is calculated holding the shape of the age profiles of consumption and labour income fixed. Equation 3 gives the definition of the economic support ratio.

$$\frac{L(t)}{N(t)} = \frac{\sum_a^{\omega} =_o Y(a)P(a,t)}{\sum_a^{\omega} =_o \phi(a)P(a,t)} \quad (3)$$

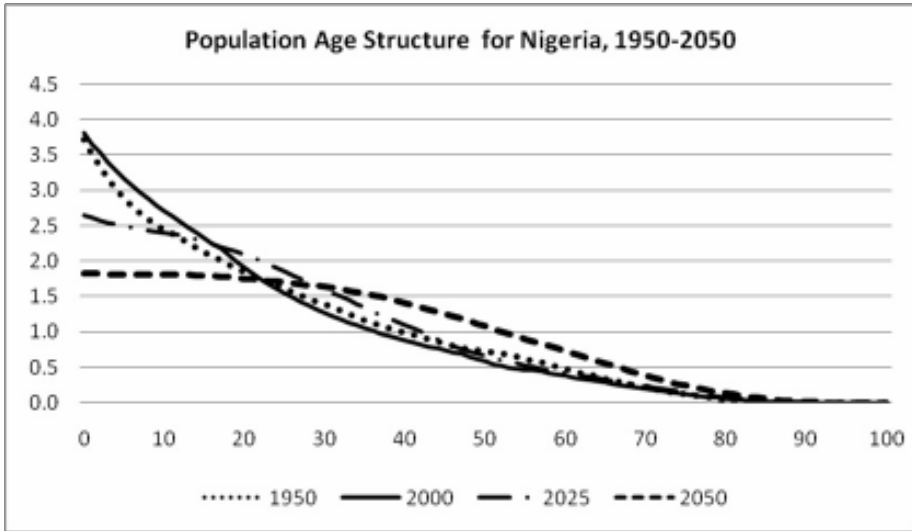
Equation 3 indicates that the economic support ratio measures the effect of age structure on the capacity of a population to contribute to current production. This is based on the belief that the age profiles of production and consumption reflect a wide variety of behavioural, institutional, and cultural factors and thus will affect the productivity in different economies. Demographic dividend is thus defined in this paper as the growth rate of the economic support ratio. It should be noted that given labour productivity, 1% increase in support ratio leads to 1% increase in per capita growth (Mason, 2011)

## Results

The evolution of age structure in Nigeria is presented in Figure 1 to show how the demographic transition evolved during the period of analysis between 1950 and 2050. Nigeria in 2010 was a very young population with the proportion of under 29 year olds representing more than 55 percent of the population. Nigeria experienced high fertility and mortality rates over the years. Fertility however started declining since the 1980s although slowly (Bloom et al, 2010b). It is expected that both crude birth and death rates will continue to fall beyond 2010 and should affect the ratio of the working population to total population, which will increase, thereby creating the potential window of opportunity for

the country. Between 1950 and 2000, total fertility rate fell by more than half and was expected to fall even more by 2005. This will see the population shift-

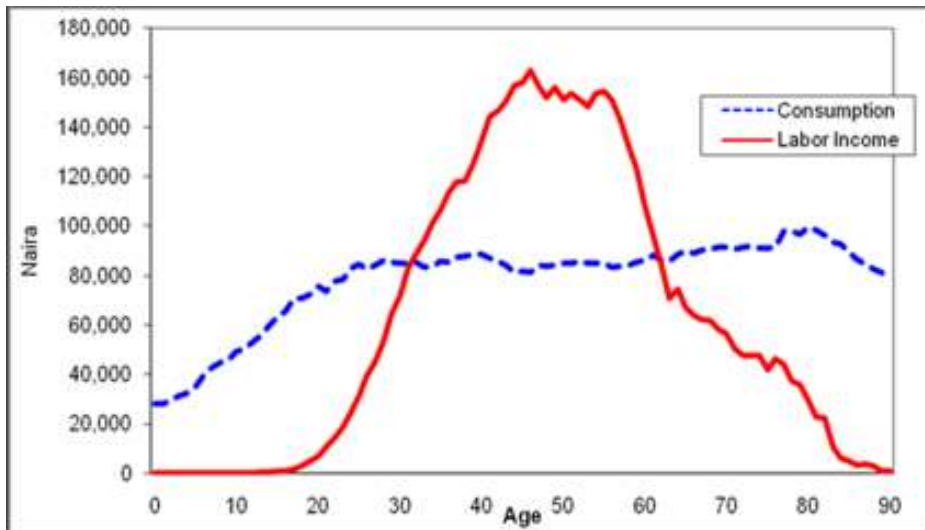
ing away from the very young population structure (figure 1) and by 2050, the country will have a larger proportion in the working age.



**Figure 1** Population age structure for Nigeria, 1950-2050

This relationship between fertility and mortality rates has thus opened the window of opportunity. The factors that shaped the dividend lie in the relationship between the number of effective producers as well as the number of effective consumers within the country. This is derived by the age profiles of labour income and consumption in the country. Figure 2 presents the estimated age profiles of production and consumption for Nigeria in 2004. The figure indicates that on the average, consumption is higher than labour income for the dependency ages. In the case of the children, consumption at each age level by Nigerians exceed their labour income until 33 years of age when the labour income are more than the consumptions on the average,

This is the situation until an average person reaches age 63 when old age dependency effectively starts with labour income falling rapidly and falling short of covering consumption expenditure. The estimates reveal that the surplus in the productive years is not enough to cover the deficit from the dependent years leading to lifecycle deficits (Olaniyan et al, 2010). The results are consistent with the general understanding of the lifecycle where lifecycle starts with child dependency to a period of production surplus and ending with old-age deficit (Lee and Mason 2012).



**Figure 2** Per capita consumption and labour income, Nigeria, 2004

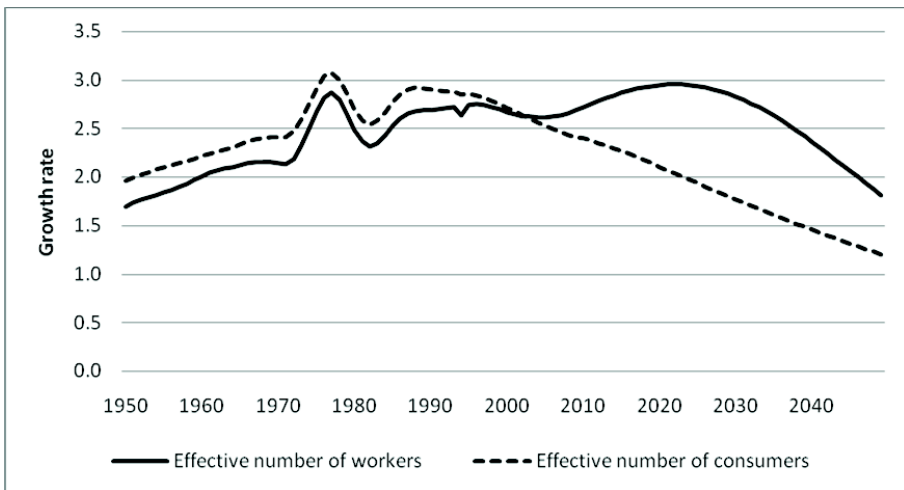
Once the life cycle deficit is found, it is possible to estimate the evolution of the first and the second demographic dividends. As described above, demographic dividend is determined by the economic support ratio which is the ratio of effective number of producers to effective numbers of consumers. This is presented in figure 3. The figure reveals that the growth rate of effective producers peaked at about 3% between 2020 and 2030 from a rate of 2.6 percent in year 2010. The growth of effective producers will eventually start declining from 2023 and by 2050 it will only be growing at just above 1.8%.

This difference in the two rates determines the window of opportunity. The first demographic dividend for Nigeria dividend is shown in Figure 4 which is drawn from the growth rate of the difference between the number of

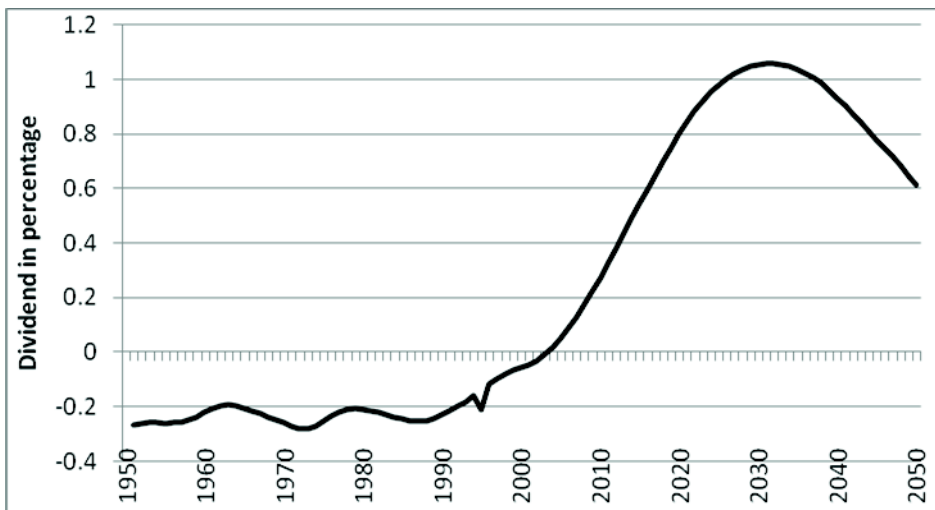
effective producers and effective consumers (i.e. the economic support ratio). The results indicate that as the economic support ratio increases, the dividend starts to increase rapidly and when the economic support ratio decreases the effect of the dividend also declines. Figure 4 indicates that from 1987 to 2031, the demographic situation is favourable. In fact, since the beginning of the twenty-first century, as changes in the economic support ratio has a strong effect on output per worker. The ratio increased by 52% between 2003 and 2031.

Our result further reveals that the country only started experiencing the first dividend in year 2003 and will last beyond 2050 (Figure 4). Before 2003, the existing age structure represented a drag on growth in per capita income. The demographic transition process has

been a drag in the country until 2003 growth of the economy.  
when it contributed to the negative



**Figure 3** Growth rates of effective consumers and effective producers, Nigeria 1950-2050



**Figure 4** First demographic dividend, Nigeria, 1950-2050

## Discussion

Economic growth and performance of any country is dependent on the output from the productive population. The productive population which is often regarded as those within the working age generates the income and thus the surplus for the economy. The results of this paper reveal that in contrast to the general understanding of dependency years being the ages not within the working age (i.e. 15-65 years) the child dependency actually extends to more than double the perceived age. Child dependency in Nigeria does not end until age 33<sup>4</sup>. In the same vein, old-age dependency does not start on the average before age 63. The implication is that the ages for which an average Nigerian enjoys lifecycle surplus span 30 years between ages 33 years when income exceeds consumption and age 63 year when consumption once again exceeds income.

The implication is that when output from the effective producers is equal to the consumption by the effective consumers in 2003, the economic support ratio becomes positive and more is being produced than consumed. This gap between the period when output from the effective producers is equal to the consumption by the effective consumers creates the window of opportunity or demographic dividend for Nigeria. The bigger the gap between the when output from the effective producers and the consumption by the effective consumers, the bigger the dividend becomes and vice versa.

Although the growth of effective producers declined between 2023 and 2050, it will still be higher than the growth in the number of effective consumers but the gap between the two will keep reducing as the dividend dissipates.

In fact between 1950 and 1995, age structure of the Nigerian population actually reduced the potential economic growth of Nigeria by as much as 0.2 percent. However, since 2003, the dividend has turned positive and shall remain positive till 2050 which is the end of our simulation. The prospect for the dividend reaches its peak in 2031 and 2032 before it starts to decline. It should be noted however, that the dividend is transitory and will end at some point in time. Although we do not know when the dividend will become a drag but findings from other countries indicate that the first dividend always last for between 30 to 60 years. For example, while it lasted an average of 29.7 years in the industrial countries, the period is expected to be much higher in developing countries with an average of 47.9 years in Latin America and 52.3 in the Middle East and North African countries (Querroz and Turra, 2010).

While the demographic backdrop for a demographic dividend can be confidently predicted and quantified over the medium term with a high degree of accuracy through population projections, the ability to take advantage of the demographic situation is related to human resources and other economic policies (Wongboonsin *et al.* 2005).

4. The age represents the age at which production is equal to consumption. Early age represent age at which young adults starts to produce as much as they consume while later stage represent the age after which they no longer produce as much as they consume.

What is important therefore, is the need to harness the dividend, some of which can be used to increase consumption, raise current standards of living, and some can be invested in human or physical capital or in stronger institutions that will lead to permanently higher economic growth (Mason and Lee, 2006). In order to assess the size of these effects it is useful to compare the first dividend to the rates of economic growth achieved during the same periods. The average growth of the country between 2003 and 2007 which was 6.9 percent (CBN, 2008), and when compared with the prospect of demographic dividend, our estimates reveal that the first demographic dividend was already becoming a catalyst in the observed economic growth of the country. However, the contribution is expected to increase over the years and will contribute as much as 18 percent to economic growth by year 2030 and about 10 percent to the GDP growth in 2050 if the current average growth rate exists at the time<sup>5</sup>.

## **Conclusion**

This paper has examined the issue of demographic transition in Nigeria and how changes in population age structure can open windows of opportunity for rapid increase in economic growth. The paper found that population age structure is important for economic growth because it can have a permanent effect on consumption by influencing the accumulation of assets but the outcome is highly policy-dependent. This study has shown that the demographic transition in Nigeria is

capable of leading to more rapid growth in output per capita if the right policies are put in place. The current transition being experienced in the country suggests that the first population dividend offers a positive development opportunity during the coming decades.

In order to harness the opportunity for economic growth however, the opportunity must be grabbed while it is still available. Nigeria thus needs a policy environment to encourage growth. The present high unemployment rates have to be tackled if the increase in economic support ratio will be productively utilised. This will include embarking on adequate employment policies to accommodate the increase in working population. An increase in employment in the country will require adequate infrastructure availability.

If the capacity of the working population has to be harnessed, then the human capital in the country must be improved upon. This involves the development of education and health in the country so as to improve the overall productivity within the country. The education system in the country must emphasise the right relevance entrepreneurship and private sector employment. Government must thus invest heavily on the right education, health and human resource development for all her citizens. The implication is the need to develop the country's human capital so that the large number of working population can have the necessary skill to lead the economic growth of the country. Specifically, the following issues are important. Such notions lead

5. This is based on the assumption that the GDP per capita grows at an average of 10 percent per annum.

to a question of how Nigeria should modify its curriculum to equip its human resources with these qualifications to sustain the competitiveness of the economy.

Since the period of the first dividend will also generate a high surplus for those within the working population, then there is need to develop a good macroeconomic policy to encourage savings, investment and asset acquisition which will in turn position the country towards reaping the second demographic dividend when that window of opportunity eventually opens. Individuals will only save and invest in a right policy environment with low inflation, transparency, efficiency of the financial institutions and enforcement of the rule of law. Individuals must be encouraged to invest as they earn and generate more savings from the low dependency ratio. The savings must however be invested in such a way as to increase the capacity of the current and future labour force to participate fully in a skills-based economy. The financial sector must thus be improved upon and the right policies should be put in place to develop the pension assets, capital market, financial literacy and domestic investment environment. An increase in working population over the next few decades will eventually lead to a high population of the old age later. Social protection for the elderly must thus be put in place so the country will not end up with elderly that are destitute. This would involve an increase in pension coverage and free health for the elderly. The pension system should emphasise an asset-based pension systems and reduce the reliance on public pensions. In the same vein, since many elderly in

Nigeria are still engaged in the labour market, policies must be put in place to improve access to labour markets for elderly.

While we have taken all efforts to be consistent as much as possible, the results presented here are suggestive as they can be explored further. First, all of the simulations have been based on age profiles of consumption and labour income for Nigeria for 2004. There is the possibility that the profiles might vary overtime and across different policy regimes. This might influence the actual future values of the dividend that the country will enjoy. The absence of series of comprehensive national living standard surveys for the country limit the ability of this study to examine how the profile might vary over time.

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## **References**

- Bloom D., Finlay, J. Humair, S., Mason, A., Olaniyan, O. and Soyibo, A. 2010 "Prospects for Economic Growth in Nigeria: A Demographic Perspective": Paper presented at the IUSSP Seminar on Demographics and Macroeconomic Performance held at Novotel, Gare de Lyon, Paris, France 4-5 June 2010.
- Bloom, D. and Williamson, J. 1998. "Demographic transitions and economic miracles in emerging Asia." *World Bank Economic Review*

- 12:419-455.
- Bloom, D., Canning, D., Fink, G. and Finlay, J. 2007. "Realizing the demographic dividend: is Africa any different?" <http://www.hsph.harvard.edu/pgda/working.htm>. Accessed 10 June 2010
- Bloom, D., Canning, D., Fink, G. and Finlay, J. 2010. Microfoundations of the Demographic Dividend. Paper presented at the IUSSP seminar on demographics and Macroeconomic Performance, Paris. 4-5 June.
- Bloom, D., D. Canning, et al., 2001. "Economic Growth and Demographic Transition". *NBER Working Paper* - Number 8685.
- Bloom, D., D. Canning, et al., 2003. "Demographic Dividend: New Perspective on Economic Consequences". Santa Monica, RAND Corporation.
- Central Bank of Nigeria (CBN) 2007 *Annual Accounts and Statement of Accounts* Abuja: CBN
- Cutler D., Porteba, J., Sheiner, L., Summers, L. and Akerlof, G. 1990. "Aging Society: Opportunity or Challenge", *Brookings paper on Economic Activity* 1990:1-73
- D'Adamo, P. 2004. *Understanding the demographic dividend*. <http://www.developmentgateway.org/>.
- Dramani, Latif and Fahd Ndiaye 2012. Estimating the First Demographic Dividend in Senegal: The National Transfers Account Approach *British Journal of Economics, Management & Trade* 2(2): 39-59
- Eastwood, Robert & Michael Lipton 2011. Demographic transition in sub-Saharan Africa: How big will the economic dividend be?, *Population Studies: A Journal of Demography*, 65 (1), 9-35
- Feng, W. and Mason, A. 2005. "Demographic Dividend and Prospects for Economic Development in China", Paper prepared for UN Expert Group Meeting on Social and Economic Implications of Changing Population Age Structures, Mexico City, August.
- Kalemli-Ozcan, Sebnem 2012. AIDS, "reversal" of the demographic transition and economic development: evidence from Africa *Journal of Population Economics* 25:871-897
- Kinugasa, T. 2004. Life Expectancy, Labour Force, and Saving, Unpublished Ph.D. Dissertation. University of Hawaii at Manoa
- Lee Mason and Miller 2003 "Saving, Wealth and the Transition from Transfer to Individual Responsibility: The Cases of Taiwan and the United States", *Scandinavian journal of Economics* 105: 339-357.
- Lee, R. and Mason, A., 2006. "Back to Basics: What is the Demographic Dividend," *Finance & Development*. Washington, D.C.: International Monetary Fund, pp. 16-17.
- Lee, R., Lee, S., and Mason, A. 2006. "Charting the Economic Life Cycle", In *Population Aging, Human Capital Accumulation, and Productivity Growth*, pages 208-237, Edited by Prskawetz, A., Bloom, D. E. and Lutz, W. New York: Population Council.
- Lee, R. and Mason, A. editors, 2011. *Population Aging and the Generational Economy: A Global Perspective*, Cheltenham: Edward Elgar Publishers.



- Mason, A. 2007 "The Economic Life Cycle and Population Age Structure" Substantive Report of Work accomplished during the 38<sup>th</sup> Summer Seminar on Population Workshop on Population, Development and Policy: The Economic Payoff of Population Change (downloaded from <http://www.schemearts.com/proj/nta> 10th June 2010).
- Mason, A. 2003. *Population change and economic development: What have we learnt from the East Asia experience?* Applied Population and Policy 1,1: 3-14.
- Mason, A. 2005. Demographic Dividends: The Past, the Present, and the Future mimeo University of Hawaii: Paper prepared for the Joint International Conference of The 21st Century COE (Centre of Excellence) Program of Kobe University and the Japan Economic Policy Association (JEPA).
- Mason, A. and Lee, R., 2007. Transfers, Capital, and Consumption over the Demographic Transition. *Population Aging, Intergenerational Transfers and the Macroeconomy*. R. Clark, N. Ogawa and A. Mason, Elgar Press.
- Mason, A. and Lee, R., 2006. "Reform and Support System for the Elderly in Developing Countries: capturing the second demographic dividend." *Genus* LXII(2): 11-35.
- Mason, A., Lee, R., Tung, A., Lai, M. and Miller, T. 2009. "Population Aging and Intergenerational Transfers: Introducing Age into National Accounts", in *Developments in the Economics of Aging*, Edited by David Wise, (National Bureau of Economic Research: University of Chicago Press).
- NBS [National Bureau of Statistics] 2007. *National accounts of Nigeria, 1981-2006*. Abuja: NBS.
- NTA [National Transfer Accounts] 2010. National Transfer Account website. <http://www.schemearts.com/proj/nta> Accessed 10 April 2010.
- Queiroz, B. L. and Turra, C. M., 2010. Window of Opportunity: Socioeconomic Consequences of Demographic changes in Brazil. Paper presented at the IUSSP seminar on demographics and Macroeconomic Performance, Paris. 4-5 June.
- Queiroz, B. L., Turra, C. M. and Perez, E. R., 2006. "The Opportunities we cannot forgo: Economic Consequence of population Changes in Brazil", Paper presented at the Brazilian Population Association Meeting, Caxambu, Brazil, 18-22 September.
- RAND 2002. Banking the "Demographic Dividend" How Population Dynamics Can Affect Economic Growth. *Population Matters: RAND Policy Brief*
- Rentería, E., Romero, M. S. and Souto, G. 2009. The Impact of Changes in Population Age Structure on the Economic Growth of Spain Paper presented at the XXVI IUSSP Conference Marrakesh. 27 Sept - 2 October.
- Ross, John 2004. *Understanding the Demographic Dividend*. POLICY Project, Futures Group
- Soyibo, A 2011. The Demographic Dividend and its Prospects in Africa. Invited Plenary Paper, International Conference on Family Planning, Dakar, Senegal, 30<sup>th</sup> November.

- UN [United Nations ]2007 *World Population Ageing 2007*. New York: United Nations.
- UNDP [United Nations Development Programme] 2009.*Human Development Report Nigeria. 2008 – 2009 Achieving growth with equity*; Abuja: UNDP.
- Wongboonsin, K. and Guest, P., 2004. Policy Synthesis on the Demographic Dividend: Experience from ADRF's Working Method. The 6<sup>th</sup> Asian Development Research Forum General Meeting, Bangkok, June 7-8.
- Wongboonsin, K. , Guest, P. and Vipan, P., 2005. 'Demographic Change and the Demographic Dividend in Thailand', *Asian Population Studies*, 1(2), 245-256.