

# The Second Demographic Dividend: The Challenge for Uganda

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## **Abstract:**

**Purpose:** To investigate the challenges of Uganda's demographic structure in relation to the country's ability to harness a demographic dividend

**Design/Methodology/Approach:** We analyze secondary data from the World Bank data base on Uganda for the period 1983 to 2017. This data is supplemented with secondary data from the Uganda Bureau of Statistics. We run a multiple regression test to enable us predict the likely contribution of the selected demographic characteristic towards the country's GDP per capita growth and check the robustness of the model by conducting various tests such as the Breusch Godfrey and Arch tests.

**Findings:** Results show that: GDP growth, age dependency ratio– young & old and annual urban population growth have a positive impact on per capita GDP growth while young dependency ratio, total population, annual population growth and mortality under 5 have a negative impact on per capita GDP. Collectively, the demographic characteristics studied explain 93.9% towards the country's potential to harness the demographic dividend (Adjusted R-square 0.9391;  $p < 0.000$ ).

**Practical implications:** Although there exists studies relating to demographic characteristics to the demographic dividend, none of the studies identified particularly deals with Uganda singularly. Most studies study Uganda in relation to other countries. This study handles Uganda's case to exploit the demographic dividend given the studied demographic structure of the country. The study brings to light that with the right policies and institutions in place based on evidence provided by the study, the potential for Uganda enjoying the demographic dividend exists.

**Originality/value:** This study shows how Uganda can exploit her demographic structure to enjoy a demographic dividend

**Key words:** Demographic dividend; demographic structure; mindset; demographic transition

**JEL Codes:** J11, J13, O10

## I. INTRODUCTION

The African Union Agenda 2063 lists among its aspirations the ability to effectively harness the potential of its demographic structure with emphasis on the women and youths to achieve development. The large proportion of the youth in relation to other ages is viewed as a key potential to drive Africa's growth once effectively utilized with the right skills and mindset. The structure of the population is likely to usher in dividends at a time when more of the population

enters the active labour force releasing public expenditures earlier devoted to social programmes like education and health into more productive sectors like infrastructure. Africa continues to experience persistent high levels of fertility as people still hold children as insurance against old age (Bloom & Williamson, 1998). At the same time, the mortality rate is declining due to the improvement in health facilities. This is key to explaining the heavy bottom age structure characterized by many poor countries with its associated socio-economic problems such as, poverty, low education levels, poor health and crime wealth. The good news is that there all indications the fertility rates and dependency ratios have started to decline which suggests the potential for Africa to enjoy a demographic dividend (Bloom, Kuhn & Prettnner, 2016)

Whereas Bloom, Canning, Fink & Finlay (2007) rightly observe that Sub Saharan Africa has high fertility rates, their generalization and association of high fertility rates with falling life expectancy may not apply to countries like Uganda. According to the statistics provided by Worldometer (2020), while the fertility rate in Uganda is projected to remain high averaging 5.01 through the year 2050, the life expectancy has increased to 64.38 years from 50.4 years in 2002 (Uganda Bureau of Statistics, 2016). The rise in life expectancy may imply an increase in the working population that is necessary to support both the younger and old aged non working population. This would predict a green light to Uganda's prospects of enjoying the demographic dividend which unfortunately is dampened by the high levels of youth unemployment (Uganda Bureau of Statistics, 2016). The call for right institutions and policies as advised by Bloom et al. 2007; Bloom, Kuhn, & Prettnner, 2016 needs to be taken seriously by the Government of Uganda to ensure the youth are rightly skilled and the labour markets are functional to provide adequate job opportunities for both the youth and the aging population whose skills can still be utilized. In Uganda, the official retirement age is 60 years and experience has shown that many people going by the life expectancy of 64.38 are still of sound mind and can be engaged to contribute productively to the country's gross national product. Once attention is paid to this reality, Bloom et al, 2007 fear that Sub Saharan Africa may miss out on the demographic dividend may not hold.

The international conference on family planning held in Ethiopia in 2013 defined the demographic dividend as "the

accelerated economic growth that may result from a rapid decline in the country's fertility and subsequent change in the population age structure (PRB, 2013). In this paper, we use the demographic dividend to refer to the accelerated economic growth that may result from a decline in a country's mortality and fertility and the subsequent change in the age structure of the population. It is the growth in an economy that results from the effects of the changes in the country's population age structure. Dyson (2010) argues that falls in mortality rate are a key support to a country's economic growth. Dyson (2010) identifies population growth, fertility, changes in the age structure and urbanization as essential demographic factors that affect the country's level of economic growth. The literature points to the critical importance of understanding the country's age structure as opposed to focusing on the population size or growth rate arguing that the country's productivity levels are largely dependent on her population age structure. To enjoy a demographic dividend, the country's ratio of the working population to the dependent ratio (non – working population) should increase. As the working population grows, it ages as well with the associated health costs of aging which may reduce the country's productivity levels and growth if adequate pre-planning for the various stages of the demographic transition is not done. It has been reported that the changes in the country's age structure for example, is being followed by increases in non communicable diseases among the young. These diseases include: diabetes, cancer, cardiovascular diseases, hypertension and obesity contributing 23% of the disease burden in 2010 and 33% in 2016 (UBOS, 2016).

The Uganda Vision 2040 highlights the key challenge for Uganda's efforts to reap the demographic dividend and achieve economic growth and prosperity to be the structural challenges with the labour force that is under or unemployed due to the skills mismatch. According to the National Census 2014, the younger people below the age of 30 years constitute over 70% of the country's population and the majority of the population 65.6% is dependent on subsistence agriculture. The National Population Council (2018) report suggests that Uganda is experiencing a demographic transition characterized by increases in the population growth, decrease in death rates due to improved health facilities, fertility decline and falling mortality rates which are viewed by many as key pre-conditions for any country to enjoy a demographic dividend. The Uganda National Household Survey of 2016 put the proportion the country's population trapped in chronic poverty at high 10%! The country has a large proportion of a youthful population that constitute almost half of the population which if well planned and managed spell a bright future of the country as far as the provision of an active labor force is concerned which would propel the country to growth. The unfortunate part is that the youth are caught in a web of unemployment, underemployment and vulnerable employment with most of the youth lacking employable skills with the effect that some have to crime other than productive

work. Uganda's demographic transition can be visualized in figure 1

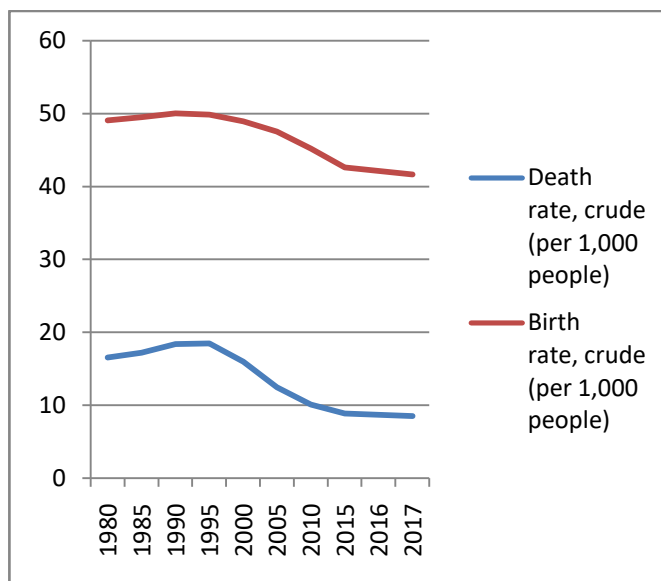


Fig 1: Uganda's demographic trends

Source: Own computations from World Bank data 1980- 2017

Figure 1 clearly shows that Uganda is gradually moving into the second phase of the demographic transition characterized by falling birth rates and death rates. A critical analysis of the above figure clearly shows that the gap between the birth and death rates much as all are falling is still very wide which may constrain the country's ability to harness the demographic dividend in the near future. The statistical abstract published by the Uganda Bureau of Statistics in 2018 provide key statistics related to Uganda's demographics among which include: the average literacy rate of those above ten (10) years of age for the years 2014/15 to 2017/18 to stand at 72.85, the labour force participation to stand at 52.3% much as the employment rate is reported at 78.8% with 43.2% of the labour force employed in subsistence agriculture. The unemployment rate is reported to have fallen from 9.4% in 2012/13 to 9.2% in 2016/17. The statistical abstract reports an upward trend in the poverty levels from 19.7% in 2012/13 to 21.4% in 2016/17. This increase in poverty levels has been followed by the rise in crime rate from 243,988 cases in 2017 to 252,065 cases in 2017 with defilement cases accounting for 50% of the crimes committed in 2017. The government spending on the health sector as a percentage of the total government expenditure though increased from 6.5% in the year 2015/16 to 8.9% in the year 2016/17 is still far below the recommended 15% from the Abuja Declaration.

The question addressed by this paper is whether Uganda can effectively exploit the opportunities provided by her demographic structure to harness the demographic dividend exposed by the demographic transition the country is currently experiencing. Is there evidence that the country is laying the right policies and institutions suggested by prominent

population analysts like Bloom et al. that will enable the country to harness the demographic dividend? The demographic dividend once enjoyed by the country is manifest in the rise in the country's gross national product. This paper analyzes Uganda's preparedness to harness the demographic dividend out of her demographic structure by relating selected aspects of the country's demographic structure to the country's GDP per capita levels.

## II. REVIEW OF RELATED LITERATURE

The Malthus theory of demographic transition posits that country's go through stages of the demographic transition. The first stage characterized by high birth rates and high death rates, the second stage characterized by high birth rates and low death rates and the third stage characterized by both low birth rates and low growth rates. The dividend starts from the second stage and its full benefits is reaped in the third stage. Uganda as a country is still in the second stage will all indications that the country is moving to the third stage given that the population growth rate as obtained from the World Population Prospects, 2017 shows a steady decline in the country's population growth rate for the years 2005 to 2019 which is even projected to fall further for the years 2020 to 2050. However, the population growth rate though falling and still projected to fall is still quite high given that the current population growth rate is given at 3.26 and is projected to fall in 2020 to only 2.29 which is a recipe for economic woes for the country if not well managed in time and may make the dividend unrealizable. The population experts project that if a country's population growth rate is two percent, the country's population will double within 35 years. Given that Uganda's population growth rate is already exceeding two percent the population is expected to double within less than 35 years.

The theory of demographic transition posits three key stages, stage one characterized by high birth rates and death rates, stage two characterized by high birth rates and falling death rates and stage three characterized by low birth rates and low death rates. In Africa, high birth rates are accounted for by people who produce more children as a source of security for old age and the uncertainty that the child will reach maturity age. With improved health facilities, the death rates are declining and people have started appreciating the use of family planning methods given that the rate of child survival has increased. The effect of this has been low mortality rates and reducing fertility rates, a necessary condition for a country to enjoy a demographic dividend. The demographic dividend reaches a saturation point with a shrinking population and a high ratio of the aged to the working population (Bloom & Williamson, 1998). Bloom & Williamson (1998) expound three key mechanisms through which the demographic dividend is delivered as long as the right policy environment is in place. 1) Increase in active labour supply accompanied by an efficient labour market 2) increased savings of the working age group enabled by the low levels of dependency 3) human capital enabled by

increases in the population life expectancy where parents ably provide more years of education to their children.

In a study conducted by Bongaarts (2010) involving 30 African countries, it was found that women with more years of education tend prefer less children compared to women with less education. With fewer children per woman, the possibility of a high dependency burden paused by the high proportion of the young as compared to the working population will reduce paving a way for countries like Uganda to enjoy demographic dividend. The women preference for fewer children as they get more education increases their participation in productive economic activities. The key challenge to Uganda is the high fertility rate that the country experiences and is likely to continue experiencing for many years to come. This is because population growth is associated with what economists refer to as the hidden momentum of population growth. The hidden momentum of population growth is the tendency of the population to continue growing at a high rate even after the fall in the birth rates mainly because when the young population is large, in their near future the population will be even if fertility levels lower. The reduction in birth rates today may take some years to translate into reduced population growth. This is because, children born today when preference for fewer children becomes the norm are all potential parents, say, eighteen years from now, when legally in Uganda, a person is considered to be of full age. According to the World Population Prospects report of 2019 as accessed from the Worldometer ([www.Worldometers.info](http://www.Worldometers.info) accessed July 14<sup>th</sup> 2020), the fertility rate in Uganda stood at 7.10 in 1985 and is predicted to stay at 5.01 from 2020 to 2050. This predicts a continued strain on the country's resources for many years to come in form of increased levels of dependency paused by a heavy bottom age structure.

The microeconomic household theory of fertility explains the high preference for children in most developing countries to be a result of how the population views children as both consumer and investment goods. According to this theory, children are more of an investment than a consumption good in most of the developing countries. The children are taken to be a hedge against the risks associated with aging, and parents are assumed to have children upto the point at which the marginal economic benefit equates the marginal private cost.

The declining fertility rate predicted for Uganda in the years to come predicts the high potential for the country to enjoy the demographic dividend. According to Bloom et al., (2016), a declining fertility rate enables a country to enjoy the demographic bonus through three mechanisms 1) improves the ratio of women in active labour force 2) release funds for governments to invest in health and child education for future productivity and 3) enables a rise in savings for retirement. Bloom, Canning & Sevilla (2001) associate a high proportion of the working age group to be a blessing to a country's level of economic growth if the right policies and institutions are in place. Without the right policies and institutions in place, an increase in the working age will attract penalties like youth

unemployment and increased crime rate that will dump the demographic dividend (Bloom & Williamson, 1998; Bloom, Canning, Fink & Finlay, 2007; Bloom, Kuhn, & Prettnner, 2016).

The international conference on family planning held in Ethiopia in 2013 (PRB, 2013) identified three key areas that African countries need to re-direct their investments if they are to harness a demographic dividend out of their demographic structure. 1) promote family planning to minimize the burden of dependency on the working population 2) work towards maintaining a healthy and educated population and 3) improve governance to improve investor confidence. Broom et al. (2001) drawing from the East Asian economies experience highlight the critical areas that a country like Uganda need to pay attention to if it is to harness the demographic dividend out of its population structure. The critical areas suggested include having the right policies in public health, education and trade. These critical areas are also reflected in Bloom, Canning, Fink & Finlay, 2007. Many researchers in economics and population studies attribute the country's ability to benefit from the demographic dividend out of the falling fertility rates, mortality rates and an increase in the active labour force (Minh, 2012). As countries record improvements in health are registered together with increases in the country's life expectancy which also has its own challenges. Longer lives have their own social and economic challenges that countries must plan for such as, increase in diseases related to old age like cancer, arthritis, diabetes and heart diseases (U.S. Department of State, 2007)

There is a close relationship between the demographic transition and the demographic bonus that positively have growth as the demographic dividend is created by the process of demographic transition. The literature surveyed have all indications suggesting that for a country to enjoy a demographic dividend, right institutions and policies must be in place, such as, the existence of an efficient labour market to manage cases of possible unemployment. Countries that have enjoyed the demographic dividend before exhibit some of the following behaviors: high levels of saving, educated work force, high proportion of the working age population relative to the total population, an innovative dynamic business sector and high output per worker.

Bloom, Canning & Sevilla (2001) have observed that many researchers on the relationship between population and economic growth have dwelt on exploring; whether population restricts – the pessimist theorist led by Malthus, promotes –optimistic theorists like Simon Kuznets (the green revolutionists) or is independent of economic growth- the neutralists/revisionist. The pessimist thinking was grounded in the fact that whereas population grew at an arithmetic rate, food production grew at an arithmetic rate. With time, the growing population would exceed the rate of food production resulting in starvation of the population and death which Malthus referred to as the population trap. The experience of the developed countries have cast doubt on Malthus theory as

the advancement in technology in most developing countries has enabled them to sustain high levels of food production at all times when compared to the rate at which the population is growing. The developing countries like Uganda may not be as fortunate as the developed countries given their low levels of technological advancement. However, given the current trend of globalization, even developing countries like Uganda have been able to put the population trap at bay at all times as they continue to experience high levels of population growth. This trend seems to support the optimistic theory and its proponents led by Simon Kuznets and Julian Simon. Kuznets and Simon have a positive view of population in relation to economic growth.

Other researchers have concentrated on the implications of the age structure to economic growth. What is deduced from Bloom et al. 2001 analysis is that population or population structure will promote economic growth only if right economic policies are in place. If this is the true interpretation of Bloom et al.2001 thinking about population and economic growth, then we can safely say that they support the neutralists who argue that population has a significant effect on economic growth only if the right institutions are in place. The growth in the working age population is said to have a positive impact on growth while growth in total population is said to have a negative impact on growth (Bloom & Williamson 1998). Minh (2012) cites several authors that have come to a conclusion that rapid population growth in developing countries has had significant negative effect on their levels of economic growth. India is said to have experienced a simultaneous rise in population growth and GDP largely because it had invested heavily in the education of the youth and adults (Kothare, 1999). From the literature reviewed, we deduce that an increase in population that is supported by the right mindset of individuals towards work supported by the right government policies and institutions will spur the economy to growth through availability of a productive workforce that will raise the country's per capita income enabling the country to reap dividends from her population demographics.

As one transit through the life cycle, several challenges emerge at the different stages of one's life cycle that needs to be managed effectively if the country is to reap from the demographic dividend. As fertility rates fall, the possibility of families providing for their families adequately improves. The preference for few or no child at all increases, but this goes with its associated socio-economic effects as people age. The aged are likely to retire in loneliness with no one to care for them, presumably because most of the population will be in active labour force. It is prudent for countries to prepare and plan for the aging population through strengthening social security systems. Population aging strains economic growth as resources have to be channeled in activities that support the old, such as, increases in the budget of non-communicable diseases that the old are prone to (U.S. Department of State, 2007).

The experience of many countries in Asia and Latin America suggest a pathway to harnessing the demographic dividend is to exploit the power of the youth. The increase in the number of active youth as they age with more savings and wealth and invest in the next generation is a pointer for a country to enjoy the second demographic dividend. Kilimani (2006) used population growth as a proxy to the growth of the labour force and found that while labour force had a positive relationship with economic growth, it was insignificant. Bbaale and Mutenyo (2011) found that labour force which they defined as the 'total number of active' had a negative effect on economic growth. Minh (2012) citing the example of China, Indonesia, South Korea, Thailand and Vietnam in the 1970s argues that a decline in the country's fertility rate may be followed by a merely narrow window of opportunity/demographic dividend. Minh (2012) further explains why a negative relationship may exist between economic growth and population growth arguing that a reduction in population growth provides an opportunity for a country to increase her per capita GDP growth.

Minh (2012) discusses the relationship between urban growth as an aspect of the demographic structure and transition to the levels of economic growth. Minh (2012) argues that much as urbanization is associated with costs that may negatively impact growth like slum development, congestion and pollution; urban growth in many aspects is an engine of growth as it is associated with market expansion that promotes investment, infrastructural development and low production costs enabled by opportunities of urbanization in form of allowing economies of scale for industrial production.

### III. METHODOLOGY

In trying to investigate the potential of Uganda's demographic structure towards the country's ability to enjoy a demographic dividend as measured by improvements in the country's per capita GDP, we make use of secondary data from the World Bank data base on Uganda for the period 1983 to 2017. We supplement our secondary data with statistics from Uganda Bureau of Statistics National Household surveys and Uganda Bureau of Statistics demographic surveys (UBOS, 2016; 2018) to come up with the relevant descriptive statistics. The demographic characteristics used in the estimations include; the ratio of the working population to the total population; the young dependency ratio as a proportion of the working population, the total population over the years under study, the annual urban population growth, the annual population growth rate and the mortality rate under 5. We run a multiple regression test to enable us predict the likely contribution of the selected demographic characteristic towards the country's GDP per capita growth. We check the robustness of the model by conducting various tests such as the Breusch Godfrey and Arch tests to test for serial correlation and heteroscedasticity. To check for normality of the data set estimated, we performed a normality test.

### 3.1 Model specification

The theoretical model that guided the study is given by:

$$\text{Per capita GDP} = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \varepsilon$$

Where,

$\alpha$  is the intercept;  $\beta$  – Coefficients;  $\varepsilon$  - error term

$X_1$ - GDP growth                       $X_2$  - young dependency ratio

$X_3$ - working population    $X_4$ - annual urban population growth

$X_5$ - log of total population    $X_6$ - annual population growth

$X_7$ - mortality rate under 5

## IV. EMPIRICAL RESULTS

### Descriptive statistics

Table 1 provides the descriptive statistics of the study variables

Table 1. Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
Gdp per capita	382.01	182.88	153.94	739.37
GDP growth	5.80	2.97	-3.31	11.52
Age dependency ratio-young	100.22	3.34	94.01	104.56
Age dependency ratio-Young & old	105.31	3.45	98.31	109.74
Urban population growth (annual)	6.23	0.58	5.71	7.39
Rural population growth (annual)	0.01	0.07	-0.10	0.14
Mortality rate	79.64	28.04	35.40	120.20
Mortality rate, under< 5 years	130.05	51.16	49.00	202.00
Population annual	3.26	0.22	2.89	3.75
Lg(Population, total)	17.00	0.34	16.43	17.57

The descriptive statistics show that the average values for the selected variables under study are: GDP per capita 382.01, GDP annual growth 5.80, age dependency ratio young 100.22, age dependency ratio young & old 105.31, urban population growth 6.23, mortality rate, under< 5 years and population growth annual 3.26.

### Regression Test

Regression analysis was done to determine the likely contribution of a selected demographic characteristic towards the country's GDP per capita

Table 2: Regression of the coefficients (Parameter estimates)

Gdp per capita current US	Coef.	Std. Err.	T	P>t
GDP growth	7.95	3.46	2.3	0.0300
Age dependency ratio-young	-1255.29	299.65	-4.19	0.0000
Age dependency ratio – young & old	1209.70	295.83	4.09	0.0000
Urban population growth (annual)	278.27	64.64	4.3	0.0000

Lgpop total	-1619.80	498.54	-3.25	0.0030
Population growth annual	-489.97	120.51	-4.07	0.0000
Mortality rate under 5 years	-25.66	5.37	-4.78	0.0000
_cons	29488.73	8129.77	3.63	0.0010

R-squared =0.9513      Adjusted R2=0.9391

F(7,28) Prob > F = 0.0000

Results from Table 2 indicate that the selected demographic characteristics studied collectively predict their influence on the country's per GDP growth by 93.91% (Adjusted R-square 0.9391;  $p < 0.000$ ). The difference between the R square and the R adjusted square is only 0.0122 meaning that the model fit is very good. The F test is also significant which indicates that our regression equation fits well the data set used in the analysis.

*The estimated equation is as follows and the results are shown in Table 2:*

Per capita GDP = 29488.73 + 7.95 (GDP growth) - 1255.29(young dependency ratio) + 1209.70(age dependency -young & old) + 278.27(annual urban population growth) - 1619.80 (log of total population) - 489.97(annual population growth) - 25.66(mortality rate under 5)

The coefficients (beta values) indicate which variable contributes more or less to the dependent variable. This relative importance is deduced from the standardized regression coefficients (beta- weights) whose magnitudes show how much relative impact the independent variables have on the dependent variable. The negative and positive signs associated with the coefficients show negative and positive impacts respectively. The findings indicate that GDP growth, age dependency ratio- young & old and annual urban population growth have a positive impact on per capita GDP growth while young dependency ratio, total population, annual population growth and mortality under 5 have a negative impact on per capita GDP. The findings imply that a unit increase in age dependency ratio- young & old increases per capita GDP by 1209.70 while a unit increase in urban population increases per capita GDP by 278.27. Similarly, a unit reduction in the annual population growth is expected to increase per capita GDP by 489.97, a unit reduction in the age dependency ratio of the young is expected to increase per capita GDP by 1255.29, a one -death per 1,000 children below the age of five decrease is expected to result in an increase of 25.66 percentage point in per capita GDP growth and so on.

The findings indicate that age dependency ratio- young & old as a percentage of the working age population have a positive impact on per capita GDP growth. The findings show that a unit increase in age dependency ratio- young & old as a percentage of the working age population is expected to increase per capita GDP by 1209.70. This result is contrary to a priori expectations where a heavy dependency burden

imposed on the working population by both the young and old aged is expected to have a negative impact on per capita GDP growth. This is because, the working population will be strained by spending heavily on the care of the young and the old which will constrain their ability to save and invest. In Uganda's context however, this positive sign may be explained by the fact that there exists a significant level of employment of the under age (child employment) especially in the informal sector. At the same time, many of the old continue to contribute productively towards the country's GDP even after retirement, as most of the old retire in the agricultural sector which is the main stay of the economy.

The positive coefficient depicted on the annual urban population growth in relation to per capita GDP conforms to expectations of economic theory but contravene Minh (2012) finding that neither the level of urbanization nor urban growth has a statistically significant impact on per capita GDP growth. Most economists tend to associate the country's level of urbanization with economic growth. It is expected that as a country develops, people will leave the rural dominated agricultural areas for urban industry dominated areas where their productivity is expected to improve. The findings indicate that a unit increase in urban population will increase per capita GDP by 278.27. This finding associating urban growth with economic growth is in line with Dyson (2010).

The negative coefficient depicted on the age dependency ratio of the young as a percentage of the working population in relation to GDP conforms to expectations of economic theory. The findings indicate that a unit reduction in the age dependency ratio of the young is expected to increase per capita GDP by 1255.29. It is expected that the reduction in the young dependents will relieve the working population of the heavy burden of supporting them. This will empower the working population with enough income to save and invest for the future which will translate in future per capita GDP growth.

The annual population growth depicts a negative sign. The findings indicate that a unit reduction in the annual population growth is expected to increase per capita GDP by 489.97. The literature survey does not provide a clear direction of the relationship between population growth and economic growth. The finding that population is negatively related to economic growth is in support of earlier researchers like Minh (2012) and the pessimist theorists. This finding therefore contravenes the optimistic theorists that relate increases in population with economic growth as the case of India shows (Kothare,1999). However, it may not be prudent for us to conclude that population growth is bad news for a country's growth without examining the existing policies and institutions in place as suggested by the neutralists. In Uganda's case, the negative relationship between population growth and economic growth may be supported when we put into consideration the upward trend in poverty levels, the rising levels of crime dominated by defilement cases that may result in unplanned for

pregnancies and the increasing levels of youth unemployment (UBOS,2016; 2018; Bloom, Kuhn & Prettner, 2016)

The demographic variable of mortality under 5 has a negative impact on per capita GDP. The finding indicate that a one – death per 1,000 children below the age of five decrease is expected to result in an increase of 25.66 percentage point in per capita GDP growth. The finding is in support of Dyson (2010) finding that a fall in mortality rate is essential for a country's economic growth.

Figure 1 clearly indicates that Uganda is on the transition to enjoy a demographic dividend given the falling birth and death rates. The major challenge for Uganda to fully harness this dividend is the fertility rate that is still high and is hoped to remain high averaging 5.01 from 2020 through to the year 2050 (www.Worldometers.info.). At the same time, the country's life expectancy is reporting a steady increase. This may imply that Uganda is expected to enjoy a demographic dividend given that a fall in fertility rate and a rise in life expectancy tend to be associated with an increase in the active labour force (Minh,2012).

#### Diagnostic tests

##### Test for heteroskedasticity

The Breusch –Godfrey and Arch –tests were done.

Ho: Constant variance

Ha: There is a serial correlation

Table 3. Breusch –Godfrey and Arch-test

Test	Method	lags(p)	Chi2	Df	Prob > chi2
Serial correlation	Breusch-Godfrey	4	1.362	4	0.2432
heteroscedasticity	Arch-test	4	0.975	4	0.9136

The findings from the serial correlation and heteroscedasticity using the Breusch-Godfrey and the Arch test indicated that the model was free from both serial correlation and heteroscedasticity since their  $p > 0.05$ .

##### Normality Test

The normality test was performed to determine if our selected data followed a normal distribution.

Ho: Residuals are normally distributed

Ha: Residuals are not normally distributed

Table 4. Normality test

Equation	chi2	Df	Prob > chi2
Gdp per capita current us	2.417	2	0.29862
GDP growth	0.759	2	0.68405
Age dependency ratio young	0.204	2	0.90294
Age dependency ratio	5.834	2	0.05409
Urban population growth annual	0.526	2	0.76864

Lgpoptotal	11.485	2	0.00321
Population growth annual	0.187	2	0.91086
Mortality rate under 5	0.618	2	0.73403
ALL	22.032	16	0.14216

The P-values for all variables except the log of total population are greater than 0.5. We accept the null and conclude that the variables in the model are normally distributed.

## V. CONCLUSIONS AND POLICY RECOMMENDATIONS

Age dependency ratio– young & old as a percentage of the working age has a positive impact on per capita GDP growth. This is a unique finding as economic predicts that the young and old would increase the burden and strain the working age group resulting in falling rates of the country's GDP per capita. The government should consider investing in activities that promote the productivity of the young such as strengthening the Universal Primary Education (UPE) and Universal Secondary Education (USE) programs. This may eventually transmit into falling fertility rates as more girls access education. For the aging (old) population, the government should consider raising the retirement age from the current limit of 60 years to around 70 years as well strengthen the social security systems to cater for old age.

The annual urban population growth has a positive effect on the country's per capita GDP. Urbanization tends to be associated as well with negative effects like increase in crime wealth and open urban unemployment. The Government should strengthen programmes intended to create more employment opportunities in urban areas like attracting more foreign investment, invest more in urban infrastructure like transport, power, health and communication. The government programme of skilling Uganda is a step in the right direction in managing the threat of open urban unemployment. The government however should work closely with the private sector to ensure that the youth are equipped with the right skills needed in the job market given that the private sector provides a significant proportion of employment opportunities in Uganda. The literature suggests that the private sector provides 90 percent of the jobs in the developing world.

The age dependency ratio of the young as a percentage of the working population has a negative effect on per capita GDP. The Government should invest heavily in programmes that will limit people's desire for more children, which in most developing countries like Uganda includes the view of children as a hedge against the uncertainties of old age. The programmes suggested include; strengthening family planning programmes, making reproductive health programmes accessible to all, and focusing on the girl child education.

The annual population growth has a negative effect on the per capita GDP. This implies that the population growth is out matching the available resources. We also know that population growth is a key determinant of a country's level of

economic growth. The India example shows the increases in population supported by the right policies promote growth. Uganda should explore policies that promote productivity of the population such as, increasing investment in education, infrastructure and raising health expenditure from the current 8.9% to 15% as recommended by the Abuja Declaration. The government should also strengthen institutions that boost investor confidence such as, security, governance, transparency and accountability.

The demographic variable of mortality under 5 has a negative impact on per capita GDP. The government should strengthen programmes aimed at lowering fertility rate and mortality of under five. These include: strengthening immunization programmes, family planning programmes; women empowerment and a focus on girl child education. In all, reforms in education should be geared towards changing the population mindset to have a positive attitude to work and responsible parenthood.

#### REFERENCES

- [1] Agenda 2063. Agenda 2063, the Africa we want. [www.agenda2063.au.int](http://www.agenda2063.au.int)
- [2] Bbaale,E. & Mutenyo,J. (2011). Export composition and Economic growth in SSA: A panal analysis. *Consilience: The J. Sustain.Dev.* 6 (1),1-19
- [3] Bloom, D. & Williamson,J. (1998). Demographic transitions and economic miracles in emerging Asia. *World Bank Economic Review*, 12, 419-456
- [4] Bloom, D.E. & Williamson, J.G. (1998). Demographic transition and economic miracles in emerging Asia. *The World Bank Economic Review*. 12 (3), 419-455
- [5] Bloom, D.E., Canning,D. & Sevilla, J. (2001). Economic growth and the demographic transition. NBER working paper series 8685
- [6] Bloom, D.E., Kuhn,M. & Prettner,K. (2016). Africa's prospects for enjoying a demographic dividend. Discussion Paper Series. IZA DP No.10161. Bonn: Germany
- [7] Bloom,D.E., Canning, D., Fink,G. & Finlay,J. (2007). Realizing the demographic dividend: Is Africa any different? Research Gate
- [8] Bongaarts, J. (2010). The causes of Educational Differences in Fertility in sub Saharan Africa. Working Paper No. 20. NewYork: Population Council, 2010.
- [9] Dyson,T. (2010). Population and Development: The Demographic Transition. New York,NY: Zed Books
- [10] Kilimani,N. (2006). The impact of Uganda's trade liberalization policy on economic growth. Uganda Programme on Trade Opportunities and Policy (UPTOP)
- [11] Kothare,R. (1999). Does India's population growth has a positive effect on economic growth. *Social Science* 410, 2-14.
- [12] Minh,Q.D. (2012). Population and economic growth in developing countries. *International Journal of Academic Research in Business and Social Sciences*, 2(1), 5-17.
- [13] National Population Council (2018)- Uganda's demographic dividend roadmap. Transforming Uganda's Economy: Opportunities to harness the DD for SD
- [14] Population reference bureau (PRB), 2013. International conference on family planning. Addis Ababa, Ethiopia. November 12-15,2013.
- [15] U.S. Department of State (2007).Why population aging matters. A global perspective. Department of health and Human services, SA 7,6134, 2007
- [16] Uganda Bureau of Statistics (2016). The National Population and Housing Census, 2014 – Main Report, Kampala, Uganda
- [17] Uganda Bureau of Statistics (2018). Statistical Abstract . Kampala, Uganda
- [18] UNFPA (2014). State of the World Population 2014. United Nations Population Fund, New York
- [19] Worldometer ([www.Worldometers.info](http://www.Worldometers.info)- accessed July 14<sup>th</sup> 2020)