Global Scientific JOURNALS
GSJ: Volume 10, Issue 3, March 2022, Online: ISSN 2320-9186
www.globalscientificjournal.com

Effect of Female Education and Fertility on Economic Growth in Nigeria

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1.0 Introduction

This chapter studies the impact of female education and fertility rate on economic growth, the problems observed and the importance of this study.

1.1 Background to the Study

Over the years, decline in fertility rate has been a topical issue in the developing countries, without mincing words, developing regions around the world have witness the prevalence of this fertility decrease. Substantial decline have been noticed in the Latin American and Asia but very slow in Africa especially in Sub Sahara Africa (Bongaarts & Casterline, 2012) issues of fertility were high on the agenda of International Conference on Population and Development (ICPD) in 1994. This emergence has prompted African countries to adopt several policies that will surface for the control of fertility. Women education has been recognized as the best contraceptive for increased fertility (Jiang, 2014).

Nigeria as one of the Sub Sahara African countries is perceived to maintain high fertility rate since the pace of decline has been gradual. Statistically, the total fertility has declined from 6.3 in 1991 to 5.5 in 2013 as noted by (NPC, 2013). However, education attainment has gotten so high with more female involvement in recent years (Osili & Long, 2007).

Fertility is conditioned by both biologically and social factors, as in the doctrine of some African societies, there are several factors that contributed to the sustainability of high levels of fertility precisely in Nigeria (Soyinka 2014). Among these factors are high level of infant and child mortality, early and universal marriage, early child bearing as well as child bearing within much of the reproductive life span, low use of contraception and high social values placed on child bearing (World Bank 2012) . In the face of perceived high infant and child mortality, the fear of extinction encouraged high procreation with the hope that some of the births would survive to carry on the lineage (Okojie, 2010). The traditionally high values placed on marriage ensured not only its universality but also its occurrence early in life with the consequence that child bearing started early in life and in most cases continued until late in the reproductive span (Basu, 2002).

Nigeria fertility is more conspicuously far from decline in spite of the advances made towards women education, (Osili & Long, 2007, Basu, 2002). Although education cannot be said to have the sole causal relationship with fertility decline, other factors also contribute to fertility decline. Factors such as age of the women, place off residence, and region of residence, occupation, wealth status, religion, ethnicity, contraception and age at first birth of a woman contribute high or low fertility. Age of the woman influences fertility. Older women have

ultimately passed through the reproduce tive period and therefore, have more children than those with lower ages. Place of residence also influence fertility of a woman. Rural women have been noted to have higher fertility than urban women (Onoja, 2012). Rural women normally are deprived of getting higher education due to some adapted cultural practices (Adibempe, 2011). For that they marry early and start having children. Before they attain the peak of reproduction, they might have higher number of children.

Region of residence cannot be left out in fertility regulation. If the region loses its potential to develop and enhance female education, it in turn affects the female in that region. When this happens, the result is higher fertility. When women engaged in professional careers, their level of fertility is affected. These women spend much time on work and also since they are educated, they take considerable care of their children. Hence the belief that when more are begotten and some die others will remain is discarded. (Bankole, 2008). The cost of childbearing and child rearing becomes high since they recognize the benefits of education their children. With high education, the educated women also contribute to nation building and Gross Domestic Product (GDP) of the country (Onoja. 2012, Osili & Long, 2007).

The wealth status of a woman greatly influences her fertility level. Women with high status of wealth participate in the decision making process of the home.

Such women have lower fertility as they become autonomous and less dependent on men (Basu, 2002, Jejeedbhoy, 1995). Those who spend more years in school have shorter duration to reproduce than those who drop out of school and start having children, this is because education attainment position them for better negotiation in the discourse of child bearing and family planning (Akpotu, 2008).

In most Africa countries it is believed that children are a gift from God and that we should not stop them from coming to this world (Onoja, 2012). Such beliefs impede the use of contraceptives and abortion thereby increasing the level of fertility. However it obvious that education plays towards ensuring better women productivity towards improved economic growth (Basu, 2002). Premise on this background, this study set out to examine the impact of women education and fertility in attaining growth in Nigeria.

1.2 Statement of the Problem

Fertility is one among others that determines the population growth level in country. In Nigeria over time the level of fertility has been on the increase culminating into rapid increase in the level of population in the country, with an increased birth rate from 39.69% in 2000 to 47.6% in 2017 (CIA, 2018). Over the time the rate of female education has not be relatively satisfactory compared to the male counterpart and this has contribute to the rising level of both population and

fertility in the country. As relayed female dropouts in Nigeria schools were higher than males, 42.10% as against 28.67% (Ajaja, 2011), this increase has influence on the fertility rate in the country because fertility during educational enrolment is often lower than fertility without educational enrolment. Female educational enrolment has been very minimal as a result of lack of sufficient financial resources to support a child, or social norms discouraging parenting before finishing education (Thalberg, 2013). Studies done by Bankole (2008); Onoja (2012) also pointed to substantial high fertility rates in the past decades.

The completion of the second Millennium Development Goal's (MDG) target that is, 'education for all' has failed having missed the initial deadline of 2005. In Nigeria, educational facilities are generally believed to be inadequate and access is limited for many, especially girls and women, (UNDP, 2005), Nigeria was classified as a low development country in respect of equality in educational accessibility. Various cultural and social values have historically contributed to gender disparity in education (Denga, 1993) , one prominent cultural view is that it is better for the woman to stay home and learn to tend to her family instead of attending school (Obasi, 1997). The has resulted in the rise of female poverty , 70 percent of poor Nigerians are women (Onoja 2012) , high illiteracy rate; with adult female literacy rate at 49.68 percent, malnutrition and low female to male labour force participation which impedes economic growth in Nigeria.

Studies which have been carried out in the field of demography and other fields have systematically identified fertility as major component of rapid growth. Studies done by Bankole (2008), Basu (1999, 2002), Falola (2001) and Akpotu (2008) show low status of women and low education which has result over time to lack of economic power and personal decision among women in family matters and significant contribution to economic output in the country at large. Without mincing words also High population puts pressure on social amenities like hospitals, schools, and power generation of a country, among other things, result in employment, famine and drain in the resources of a state (Onoja, 2012). Since education has been identified as the tools to removing crude cultural practice and enlightening people on current issues, the best voluntarily check on fertility levels would be to educate female in Nigeria. This study therefore holistically looks at the impact of women's education, fertility and population in attaining growth in Nigeria.

1.3 Research Questions

(i) What are the trends of fertility, and education in Nigeria?

(ii) How do fertility, female education and female population influence growth in Nigeria?

(iii) What are the way forward?

1.4 Research Objective

The broad objective of the study is to examine the impact of women education and fertility in attaining growth in Nigeria. Specific objectives of the study include to;

(i) Analyze the trend of fertility, education and female population in Nigeria;

(ii) Analyze the effect of fertility, female education, and female population on growth in Nigeria;

(iii) Investigate the relationship between female education and fertility in Nigeria;

(iv) Suggest way forward.

1.5 Hypothesis of the Study

Hypothesis One:

H0: fertility has no significant effect on growth in Nigeria.

H1: fertility rate has significant effect on gross domestic product of Nigeria

Hypothesis Two:

H0: female education has no significant effect on growth in Nigeria

$H1_2$: female education has no significant effect on growth in Nigeria

Hypothesis Three:

H0: female population has no significant effect on growth in Nigeria

$H1_2$: female population has no significant effect on growth in Nigeria

1.6 Significance of the Study

This study is significant in its focus to investigate the connection amidst women education, fertility, population and economic growth in Nigeria. This study will be of great importance to women on how female education is capable of reducing the risk of childbearing, helping female autonomy, aiding decision making and the understanding of contraceptive use. Female education plays a vital role in the reduction of poverty and contributes to sustainable growth in developing nations. So, there the attention must be paid to the promotion of female education for structural transformation and economic growth. Women education also lessens the population growth rate and fertility growth rate (Dauda, 2012).

This study will greatly be helpful to the policy makers on the policies to be adopted in solving the problem of rapid population growth in order to guarantee a sustainable economy, and how the dividend from population can be obtained. In addition this study will reflect on some policy recommendation that can be used to intensify efforts at boosting female education, towards increased women productivity in the country for improved economic output.

1.7 Scope of Study

The study will focused on the role of women education and fertility in the discourse of economic growth in Nigeria, over a period 29 years covering 1990 to 2018 being a period characterized by global policy drive through millennium development goal and sustainable development goal that borders on the women empowerment for better economic productivity.

1.8 Definition of Operational Terms

Fertility: Fertility is a measure of a woman's ability to conceive a biological child. Fertility in women becomes questionable when been trying to get pregnant with frequent, unprotected sex over a period with conception.

Education: Education connotes the rate of education attainment or school completion in the country. Women education is the rate of educational attainment of women in a country.

Economic growth: Economic growth connotes measureable increase in the output of country over a specified period of time. It is usually measured in terms of increase in the quantity of goods and services product in an economic for a given period of concern.

Contraception: This is the concept of using control measures to prevent conception either for birth control or to avoid unwanted pregnancy.

Population: This is the total number of people residing in a geographical area of a country.

Growth: This is refers to increase in size, number, value or strength.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter looks into theoretical reviews and empirical studies related to female education, fertility rate and economic growth.

2.1 Theoretical Review

2.2.1 Theory of Demographic Transition

The effect of economic development on the population growth of the countries has been explained with the theory of demographic transition. The theory of demographic transition has been formulated on the basis of experience gained in the historical development of the present day developed countries. According to this theory of demographic transition as put forward by Karl Sax economic growth has to pass through four stages. These four stages in the demographic transition are as follow;

Stage I: In stage I birth rate is accompanied by high but varying death rate. As a result, the populations of a country in this stage either remain constant or grow slowly.

Stage II: In stage II, death rate steeply declines while birth rate more or less at a high level which leads to rapid growth in population this rapid growth in population above 1.5% per year has been called population explosion .

Stage III: In the third stage the birth rate start falling but the death rate level down at low level or show further slowing down. With this the growth of population slows down.

Stage IV: In stage IV birth rate and death rates balance at low level with the result that population remains more or less constant.

It is worth nothing that various stages of demographic transition are associated with the various stages of economic growth. The stage is regarded as a feature of agrarian under developed economies, the second of the take-off period of economic growth and third of the developed countries in their mature stage of economic growth.

2.2.2 Theory of Fertility:

To explain the changes in birth rate witnessed during demographic transition especially fall in the birth rate in stage 3 of the demographic transition with the development of the economy, economist have used the micro economic theory of family fertility. According to the neoclassical theory of consumer's behavior , to maximize is satisfaction from consumption of goods, children are treated as normal goods in this analysis of family fertility as in case of demand for other goods economics use indifference curves between demands for children and all other goods and budget constraint to explain the family fertility. For explaining

demand for surviving children and therefor fertility, like the demand for other goods, the following function is employed - $\underline{C_d = f(Y, P_c, P_x, t_x), x=1\ldots n}$

Where C_d represent demand for surviving children; Y represent level of family income; P_c is net price of children which is the difference between anticipated cost of children (which includes the direct cost of upbringing of a child and opportunity cost of a working mother's time) and benefits (which may consist of potential child income and age old support) on other hand P_x stand for price of all other goods ,t_x tastes or preferences for other goods relative to having children.

2.2.3 Theory of Human Capital

Human capital theory rests on the assumption that formal education is highly is highly instrumental and necessary to improve the productive capacity of a population. In short, human capital theorists argue that an educated population is a productive population. Human capital theory emphasizes how education increases the productivity and efficiency of workers by increasing the level of cognitive stock of economically productive human capability, which is a product of innate abilities and investment in human beings. The provision of formal education is seen as an investment in human capital, which proponents of the theory have considered as equally or even more worthwhile than that of physical capital (Woodhall, 1997).

Human Capital Theory (HCT) concludes that investment in human capital will lead to greater economic outputs however the validity of the theory is sometimes hard to prove and contradictory. In the past, economic strength was largely dependent on tangible physical assets such as land, factories and equipment. Labor was a necessary component, but increases in the value of the business came from investment in capital equipment. Modern economists seem to concur that education and health care are the key to improving human capital and ultimately increasing the economic outputs of the nation (Becker 1993). In the new global economy, hard tangible assets may not be as important as investing in human capital. Thomas Friedman wrote extensively about the importance of education in the new global knowledge economy, and gave evidence as to why people and education (human capital) are vital to a nation's economic success.

Human capital theory stresses the significance of education and training as the key to participation in the new global economy. The success of any nation in terms of human development is largely dependent upon the physical and human capital stock. Thus, recent social research focuses on the behavioral sciences of humanity in relation to economic productivity. Generally, human capital represents the assets each individual develops to enhance economic productivity. Further, human capital is concerned with the wholesome adoption of the policies of education and development.

2.2.4 Herbert Spencer's Biological Theory

Herbert Spencer, a famous English philosopher and sociologist, propounded the biological theory of population in his book The Principles of Biology.

Spencer believed that "there exists antagonism between individuation (survival) and fertility (reproduction)". When any individual does hard work for his personal development, say through education, the desire for reproduction (fertility) decreases.

In other words, when more energy has been utilised for one's self-development (education), the energy available for reproduction will be less and consequently the population growth will be less. Thus, with the development of society and for one's success and survival (individuation), life becomes more complex which results in reduction in the capacity of reproduction.

This is observed from the fact that fertility is more in rural individuals whose life is not complex, whereas fertility is low in an industrial society where life is more complex, the pressure of education is more and the brains are overtaxing.

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2.3 Empirical Review

2.3.1 Empirical review from developed countries.

John Clenand (1989), investigated on education and future fertility trends, with special references to mid transitional countries. A concise conclusion was made that the temporal perspective outlined in the preceding section offers for greater insight into the possible role of schooling in future fertility declines than the more common cross-sectional perspective. Also the study stated that there is probably no better guard to fertility forecasting at the national level than to assume that less privileged strata will follow the part of the most privilege.

Pinar (2010), examined the impact of female education on fertility the study used variation in exposure to CSL by date of birth as an instrumental variable, evidence from Turkey in a casual manner using a change of compulsory schooling law. The result from reduced form and instrumental variable estimations indicate that more female education indeed reduces early fertility and moreover these results are robust with respect to a rich set of controls. Additionally, robustness checks by using intensity indicators confirm the reduced form results. The study concluded by providing direct evidence that the impact of the educational policy operate through a delay in marriage, which in turn increases the proportion of women postponing child-bearing.

Michello, Lant and Justin (2018), estimated the impact of women's education fertility, child mortality and empowerment when schooling isn't learning. The study employed literacy data available in the demographic and health survey for 120 survey round, across 54 countries to estimate the impact of female basic education which are define as completing six years of schooling and acquiring literacy on a woman's fertility, survival of her child and measure of the woman's empowerment. Result showed using IV technique and data on both schooling and literacy suggested a reduction in child mortality from female basic education of 68 percent. Second, the first result suggest that achieving literacy accounts for 36 percent of the child survival improvement, 50 percent of the reduction in fertility, and 80 percent of the increase in female empowerment from basic female education. These result suggest that (a) the non-pecuniary returns from female education are even much higher than previously believed and (b) the returns to investing in cost-effective actions to improve learning outcomes, such as literacy acquisition of girls already in school could be very high, higher than investing in expanding the years of schooling.

Klasen (2005) investigated the nexus between gender inequality in education and long-term economic growth by using cross-country and panel regressions during 1990-2001. The author found that gender inequality in education directly affects economic growth lowering the average level of human capital and

indirectly through its impact on investment and population growth. The results however differ by regions. Klasen and Lamanna (2008) also lend credence to this fact. In a study carried out by Cooray and Mallick (2011), it was found that the impact of human capital disaggregated by gender has a differential impact on economic growth. Male human capital showed a positive and significant effect on growth while female human capital has no significant effect when the openness variables are considered.

Zaman (2010) seeks to establish whether there is any causal relationship between female enrolment rates and economic growth in Pakistan using co-integration and Granger causality test during the period 1996-2008. The study supports the unidirectional causality relationship between the GDP and female enrolment within the specific context of Pakistan.

Dollar and Gatti (1999) found a negative link between the gender gap in education and economic growth, in contrast to Barro's (1999) view that there is a positive relationship between the two. This prompted Klasen (2008) to avoid using the same methods as the previous researchers, to discover why they found differing relationships between gender gap in education and economic growth. Klasen (2008) showed very close links between gender inequality in labor force participation and employment, and also found that decreasing marginal returns on education means that the education of women is limited to the lower level. An

increase in male education levels when the marginal return on the education of women is higher than that for males, will affect economic performance. Many theorists believe that one of the most effective ways to reduce the fertility rate per woman and the child mortality rate which will positively impact economic growth is by promoting the education of women as this would lead to education for the next generation. Bloom and Williamson (1998) also examined education and economic growth by focusing on "demographic gift"; how falling fertility rates lead to a favorable demographic constellation after 20 years. They also found that a woman's increased employment earnings provide her with greater bargaining power within her household. An increase in women's earnings also leads to greater savings and economic growth.

Bloom and Williamson (1998) came to this conclusion by using the shortterm growth model, unlike the other researchers who used the long-term growth model. Therefore, Bloom and Williamson's (1998) conclusions may differ from those of other researchers.

Pinar (2013), examined the impact of female education on fertility, an evidence from Turkey. Using exposure on the CSL across cohort as an instrumental variable, the result indicates that an extra year of female schooling reduces teenage fertility by 0.03 births, which is a reduction of 33%. Exploring heterogeneous effects indicates that female education reduces teenage fertility

more in provinces with higher initial fertility and lower population density. Finally, the CSL postpones childbearing by delaying marriage thereby reducing fertility. The results therefore demonstrated that educational interventions in developing counties- especially ones with high teenage fertility rates-might be an effective policy toll for addressing fertility-related concerns and can accelerate the demographic transitions at later stages.

Hakan, Zar and Zehra (2015) examined the extent to which women's education effects long-term economic growth in the Asia Pacific region. It focused on the time period between 1990 and 2010, using data collected in randomly selected Asia Pacific countries: Bangladesh, Cambodia, China, India, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, and Vietnam. In addition, it emphasizes the impact of female education on economic growth as measured by GDP, literary, fertility, and the female labor force. Using panel regression analysis, it was found that the fertility rate, female labor force participation rate and female primary school enrollment are significant factors per capita income growth.

2.3.2 **Empirical Review from Developing Countries**

Jungbo (2013) emphasized on women's education in the fertility transition. It was concisely encapsulated in the study that both the demand for children and the cost of fertility control are majorly forces in fertility decline. The study

examined one aspect of fertility, namely the second birth interval in Indonesia over the period 1970 to 1993. Based on the critical examination, it was observed that higher female education is associated with a shorter birth interval among earlier cohorts, but with a longer birth interval among later cohorts. Findings then showed that changes in the effect of education on birth hazard over time are primarily driven by changes in the cost of fertility control rather than through changes in the demand for children.

Endale Anne and Wolfgang (2017) examined the stalls in Africa's fertility decline partly result from disruptions in female education. The study is primarily based on a pooled micro dataset from a total of 72 DHSs collected in 18 sub-Saharan African countries over the years 1990-2016. Within each country, the survey made use of a two-stage cluster sampling techniques to collect comparable, reliable, and nationally representative data living conditions and demographic characteristics of households. The study found that there have been stalls in the education improvement of the female cohort that entered the prime child bearing ages around the period observed.

Also, the details analyses of cohort-specific patterns and multivariate models including possible macro level period effects also indicate that the exceptional education experiences of the cohorts born around 1980 could indeed be associated with the observed fertility stalls. Because the more recent cohorts of young women

have again picked up in terms of education, this finding suggests that in the future, we may expect an acceleration of the fertility decline as the subsequent better-educated cohorts of women move into the main childbearing ages.

Garanne (2012) focused on education and fertility in Sub Sahara Africa. The study provided a longitudinal perspective on the relationship between education and fertility in sub-Sahara Africa. It analyzed long-term trends in level of education and their relationship with the fertility transition. The analysis based on 79 Demographic and Health Surveys (DHS) and 5 related surveys in 34 African countries. Level of education was measured as the Average Years of Schooling (AYS) for adults age 20 and older. Results showed a marked increase in the level of education throughout Africa, for men and women alike. For the continents as a whole, the AYS increased from 0.7 years for men born in 1900 to 2.0 years for men in 1930, and to 6.9 years for men born in 1985; for women, the AYS increased from 0.2 years in 1990 to 0.7 years in 1900 to 0.7 in 1930, and 5.6 years in 1985 based on observation.

Duone (2000), investigated the relationship between female education and fertility in Cameroon. The study explained that socio economic changes have been identified to alter demographic behavior, most especially fertility desires. It went further revealing that Cameroon just like most Sub Sahara African countries started experiencing decline in its fertility rate not too long ago. A couple of factors have

been identified to influence women's childbearing. The target group of the study was women who had at least one child, and their ages ranged from 15 to 45 years. To be able to conduct the study the 2011 demographic health survey (DHS) was used. The demographic theory and demand for children concept were used to provide theoretical framework on the topic. The study was based on the contention that the higher the education levels of women, the lesser the desire to have children. From the logistic regression perform, the results portrayed that educational level does influence women's decision to have another child especially for women with primary and secondary education. Women with no education are more likely to want to have another child than women with education. Women with primary and secondary education are significantly less likely to want another child than those with higher education.

Muktdair-Al-Mukit (2012) aimed to study the long-run relationship between public spending on the education sector and economic growth in Bangladesh from the time period 1995 to 2009. By using Co-integration technique the results reveal that there is a significant and positive association between the variables in the long run. There is 1% increase in education expenditure leads to 34% increase in economic growth in the long run. This study recommends that government should increase its expenditure on education paying more attention to the education of women.

Mahesh, David and Joshua (2007), studied the effect of fertility decline on economic growth in African. The study made use of demographic illustration to explain the trend of fertility decline from 1990- 2005. It was noted that a decline in fertility and any subsequent changes in population size and age structure are likely to affect economic outcomes through several mechanisms, each of which may operate at a different relative intensity and at a different time horizon. The results of the analysis conducted were tied to assumptions that govern the model's structure and dynamics. The model was thus more useful for the insights it may provide into underlying processes and their interactions than for the predictions themselves.

Kristin, Mry, and Heidi (2016) investigated into the pathways from education to fertility decline. The study analyzed through the use of a comparable set of variables. It was revealed that for example, we find that across all three contexts, education is associated with delayed age at firth birth via increasing women's labor force participation, but this pathway only influences fertility in rural Poland. In Motlab and San Borja, education is associated with lower local childhood mortality, which influences fertility, but this pathway is not important in rural Poland. It was suggested that there are common elements in how education drives demographic transitions cross-culturally, but the differences suggest that

local socio ecologies also play an important role in the relationship between education and fertility decline.

Navneet and Jelena (2012), investigated on female education and growth, theoretical overview and two country cases such as India and Niger. Data used are generated from the World Bank database with the focus of the time period between 1990 and 2010. Results of the two countries cases showed that both decrease in fertility rate and increase and improvement in human capital could work as mechanisms through which female education effects economic growth. It was concluded that female education has a positive effect on economic growth by increasing income per capita directly and indirectly.

Tartiyus, Dauda and Peter (2015) evaluated the impact female of population growth on economic growth in Nigeria from 1980 to 2010 given that the impact of population growth on economic growth has always been a subject of disagreement among economists and given Nigeria's high rate of population growth. The data were analyzed using descriptive statistics as well as regression analysis. The result revealed that there is a positive relationship between economic growth (proxy by GDP growth) and female population, fertility and export growth while negative relationships were found between economic growth (proxy by GDP growth) and life expectancy, and crude death rate. It was recommended among others that the average female population growth rate of Nigeria should be maintained since it is

found to impact positively on economic growth in Nigeria within the period of study and that measures should be adopted to check the crude death rate of Nigeria as it affects economic growth negatively.

Nowak and Dahal (2016) attempted to examine the association between education and economic growth in Nepal for the time period 1995 to 2013. By employing the OLS and Johansen Co-integration technique the results reveal that there is a significant and positive relationship between education and economic growth in a long run. This study recommends that policymakers must pay serious attention to the development of education system and make efforts for improvement of the quality of primary, secondary and higher education level that further leads to economic growth.

2.3.3 Empirical Review from Nigeria

There are many studies on the growth impact of human capital in Nigeria, but the specific relationship between female education and the performance of the Nigerian economy has not been adequately analyzed. However, it is noteworthy that some studies have demonstrated the importance of female education in poverty reduction. Anyanwu cited in Odusola (1998) showed that good health status and educational attainment of Nigerian women positively influenced their income in six Nigerian states, namely, Anambra, Borno, Cross River, Ogun, Plateau and

Sokoto. The coefficients of primary, secondary and technical school attainment were statistically significant at 5 percent level while that of excellent health conditions was significant at 1 percent.

Okojie (1995) also demonstrated the positive effects of female educational advancement on poverty reduction which invariably translate into economic growth and development, through a structural break co-integration analysis for the period 1980-2014. A major conclusion that has emerged from the review of literature is that diverse opinions exist concerning the impact of female education on growth. While some studies lean towards a positive effect of female education on growth, others have shown negative effect. But most studies lend credence to the fact that promotion of female education pays off substantially.

Gabriel (2015) focused on female education and fertility in Nigeria. The study used data from the 2013 Nigerian Demographic and Health Survey (NDHS). Data on 38,948 women extracted and analyzed using descriptive statistics for the bivariate, ANOVA for the bivariate and multi regression. Two models were used in the regression analyses. The results of both models showed significant correlation between the variables and children over born. It was revealed that contraceptive use is not widespread among the women. It was also evident that women with high status of wealth have lower number of children than the poorest. Religion, region of residence as well as ethnicity have an impact on fertility. The

study therefore concluded that those with lower levels of education have higher number of children than those with higher education.

Una and Bridget (2008) investigated if female schooling reduces fertility in Nigeria. The literature generally points a negative relationship between female education and fertility. Citing this pattern, policymakers have advocated educating girls and young women as means to reduce population growth and foster sustained economic and social welfare in developing countries. The study tested whether the relationship between fertility and education is indeed casual by investigating the introduction of universal primary education in Nigeria. Exploiting differences in program exposure by region and age, the paper presents reduced form and instrumental variables estimates of the impact of female education on fertility. The analysis suggested that increasing female education by one year reduce early fertility by 0.26 births.

Bamikole and Akinrinola (2010), focused on the trends and prospects of fertility transition in Nigeria. In the study, data from national and sub-national surveys were used to demonstrate trends in fertility and its determinants. The national surveys were the 1981/82 World fertility Survey (WFS) and the 1990 and 1999 National Demographic and Health Survey (NDHS). The projections into the future are based on expected changes in the factors that have sustained fertility decline thus far. The study discovered that age at marriage appears to have

increased, through minimally when viewed at the national level. Use of modern contraception has increased, and improved education (especially of women) appears to have gradually eroded some of the traditional values placed on child bearing.

Several researchers have shown the relationship between women education and fertility to be inverse in nature. In the same vein, the level of education has been reported to have higher number of children than those with higher level of education. Studies by Cochrane (1979), Jejeedboy (1995), UN Population Division (1995), Osili & Long (2007), Akpotu (2008), Basu (1996, 2002) Onoja (2012) Jiang (2014), Alene and Worku, (2008), Bankole (1995) among others have shown inverse relationship between female children and fertility.

Okwori, Ajegi, Ochinyabo, and Abu (2015), empirically examined the Malthusian Population Theory in Nigeria from 1982 -2012. The study applied vector error correction model and the result shows that Population Growth has no significant impact on Economic Development in Nigeria. This is in line with the works of Dao (2012) and Thirwal (1973). In other words, the Malthusian population theory is relevant when applied to the Nigeria economy. Therefore, if we posit that population growth is detrimental to economic development it is tantamount to averring that overpopulation and poverty are correlated which portends danger.

Khattak *et al*., (2011) attempted to examine the relationship of female education and fertility rate over the time period 1981 to 2008 in Nigeria . By employing Multiple Regression Model and Johansen Co integrations the results reveal that female education playing a vital role in the reduction of fertility rate. The study shows that female age at marriage has a negative relationship to the fertility rate. This study recommends that for reducing the level of fertility rate government should pay attention to the education of both male and female.

Moshood and Zafar (2012) aimed to find out the relationship between Female labour force and economic development in Nigeria during the time period from 1980 to 2010. By using ARDL technique, the results reveal that there is long run U-shaped relationship between Female labor force and economic development. This study shows that education and economic activities lead to labor force participation and further improve the economic development.

Adedejo, (2O14) aimed to fine out the relationship between women education and economic growth, the panel model is used to investigate the effect of women's education on the economic growth over the period 2000-2012. The result shows that a direct relationship exist between economic growth and education, especially women's education

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter analyzed the theoretical framework, estimation techniques and apriori expectations of the subject matter.

3.1 Theoretical Framework

An economic research is concern with the measurement of parameter of economic relationship and the production of value of economic variables by means of these parameters (Kontsoyanus 1997). Since the choice of this study is to measure the effectiveness of fertility and women education on economic growth, therefore the theoretical framework that will be used is the theory of Human capital.

Human Capital Theory

Human capital theory rests on the assumption that formal education is highly is highly instrumental and necessary to improve the productive capacity of a population. In short, human capital theorists argue that an educated population is a productive population. Human capital theory emphasizes how education increases the productivity and efficiency of workers by increasing the level of cognitive stock of economically productive human capability, which is a product of innate abilities and investment in human beings. The provision of formal education is

seen as an investment in human capital, which proponents of the theory have considered as equally or even more worthwhile than that of physical capital (Woodhall, 1997).

Human Capital Theory (HCT) concludes that investment in human capital will lead to greater economic outputs however the validity of the theory is sometimes hard to prove and contradictory. In the past, economic strength was largely dependent on tangible physical assets such as land, factories and equipment (Babalola , 2003). Labor was a necessary component, but increases in the value of the business came from investment in capital equipment. Modern economists seem to concur that education and health care are the key to improving human capital and ultimately increasing the economic outputs of the nation (Becker 1993).

In the new global economy, hard tangible assets may not be as important as investing in human capital. Thomas Friedman, in his wildly successful book, *The World is Flat* 2007, wrote extensively about the importance of education in the new global knowledge economy. The term itself is not introduced, but evidence as to why people and education (human capital) are vital to a nation's economic success, is a common reoccurring theme in the book.

Throughout western countries, education has recently been re-theorized under human capital theory as primarily an economic device. Human capital theory is the most influential economic theory of western education, setting the

framework of government policies since the early 1960s. It is increasingly seen as a key determinant of economic performance. A key strategy in determining economic performance has been to employ a conception of individuals as human capital and various economic metaphors such as *technological change*, *research*, *innovation*, *productivity*, *education*, and *competiveness (United Nation 2002)*. Economic consideration *per se* in the past, however, has not determined education.

Human capital theory stresses the significance of education and training as the key to participation in the new global economy. The success of any nation in terms of human development is largely dependent upon the physical and human capital stock (Zidan, 2001). Thus, recent social research focuses on the behavioral sciences of humanity in relation to economic productivity. Generally, human capital represents the assets each individual develops to enhance economic productivity. Further, human capital is concerned with the wholesome adoption of the policies of education and development. In short, the human capital theorists argue that an educated population is a productive population. Human capital theory emphasizes how education increases the productivity and efficiency of workers by increasing the level of cognitive stock of economically productive human capability, which is a product of innate abilities and investment in human beings (Woodhall , 1997). The provision of formal education is seen as a productive

investment in human capital, which the proponents of the theory have considered as equally or even more equally worthwhile than that of physical capital.

Fagerlind and Saha (1997) posit that human capital theory provides a basic justification for large public expenditure on education both in developing and developed nations. The theory is consistent with the ideologies of democracy and liberal progression found in most western societies. Its appeal was based upon the presumed economic return of investment in education at both the macro and micro levels. Efforts to promote investment in human capital were seen to result in rapid economic growth for society. For individuals, such investment was seen to provide returns in the form of individual economic success and achievement. Most economists agree that it is human resources of nation, not its capital nor its material resources, which ultimately determine the character and pace of its economic and social development. Human resources constitute the ultimate basis of the wealth of nations. Capital and natural resources are passive factors of production, human beings are the active agencies who accumulate capital, exploit natural resources, build social, economic, and political organizations, and carry forward national development.

Based on the significance of education, the concept of human capital has been brought to the forefront of many discourses in the field of economic growth and development. Studies have shown that improvements in education accelerate

productivity and contribute to the development of technology, thus improving human capital. More than anything else, it has been the spectacular growth in East Asia that has given education and human capital their current popularity in the field of economic growth and development (ECLAC, 2003). Countries such as Hong Kong, Korea, Singapore, and Taiwan have achieved unprecedented rates of economic growth while making large investments in education. In the statistical analysis that accompanied his study, the (World Bank, 1993) found that improvement in education is a very significant explanatory variable for East Asian economic growth. There are several ways of modeling how the huge expansion of education accelerated economic growth and development. The first is to view education as an investment in human capital. A different view of the role of education in the economic success is that education has positive externalities; educate part of the community and the whole of it benefits.

The idea that education generates positive externalities is by no means new. Many of the classical economists argued strongly for government's active support of education on the grounds of the positive externalities that society would gain from a more educated labour force and populace. Smith (1976) reflects such progressive contemporary thought when he wrote that by educating its people, a society derives no inconsiderable advantage from their instruction. The more they are instructed, the less liable they are to the delusions of enthusiasm and

superstition, which, among ignorant nations, frequently occasion the most dreadful disorders. Instructed and intelligent people are always more decent and orderly than ignorant ones. Smith views the externalities to education as important to the proper functioning not only of the economy but of a democratic society.

Develop countries are characterized with high level of female education which is a major cause of development**,** the high rate of female education result in low fertility rate as the opportunity cost of mother's time rise which reduces willingness to reproduce, educated women tends to have smaller families (Gary, 2005). It can deduced that education (female education) is directly related to economic growth and inversely related to fertility rate.

$$\text{FE}=\frac{\text{GDPg}}{FR}$$

Education plays a great and significant role in the economy of a nation; thus, educational expenditures are found to constitute a form of investment. This augments individuals human capital and leads to greater output for society and enhanced earnings for the individual worker. It increases their chances of employment in the labor market, and allows them to reap pecuniary and non-pecuniary returns and gives them opportunities for job mobility and reduces the time for reproduction (Fenard, 2008). Education is a source of economic growth and development only if it is anti-traditional to the extent that it liberates,

stimulates, and informs the individual and teaches him how and why to make demands.

3.2 Model Specification

The analytical model in this work could be related to the works of Hakan, Zar and Zehra (2015), Jungbo (2013), Navneet and, Jelena (2012), they all investigated on fertility rate, education on economic growth. The models is to capture the impact of fertility and women education, and the available tools in in describing are stated below with the independent variables as fertility rate, female education and female population while the dependent variables will be gross domestic product.

$$GDP = \frac{\text{Total GDP}}{total\ female\ labor\ force.}$$

GDP= f (FR, FE, FP)………………………………….. 1

In a linear equation, it can be written as follows

$GDP = \alpha_0 - \alpha_1 FR + \alpha_2 FE + \alpha_3 FP + \mu$

Where GDP = Gross domestic product

FR= fertility Rate

FE= Female Education

FP= Female Population

α_0, α_1, α_2, and α_3 are parameter while μ is the error term

3.3 Definition, Measurement of Variables and Apriori Expectations.

Gross Domestic product (GDP): This is the total value of product produce in a country in a year. This GDP is also used to calculate the per capita income (PI) in determining the standard of living. The GDP is measured by taking the quantities of all good and services produced and multiplying them by price and summing the total.

Women Fertility: This is a measure of a woman's ability to conceive a biological child. Fertility in women becomes questionable when been trying to get pregnant with frequent, unprotected sex over a period with conception. The General Marital Fertility Rate is most commonly used to measure fertility, it is calculated by dividing total female population by married female population in reproducing age group.

Women education: this connotes the rate of education attainment or school completion of women in the country. Education is measured by mean years of schooling which is the average number of completed years of education of a country's population it is often times computed by the World Bank.

Women Population: This is the total number of female people residing in a geographical area of a country. Female population is measured using the population ratio, it is the total male births divided by total female birth multiplied by 100.

The economic *a priori* expectation will evaluate the parameter in term of meeting the standard economic theory expectation. In the expectation, the "-" sign indicates that the explanatory variable has an inverse relationship with the explained variable while the "+" sign indicates that the explanatory variable has a positive relationship with the explained variable.

Parameters	*A priori* Sign
α_o	-/+
α_1	-
α_2	+
α_3	+

3.5 **Estimation Techniques**

The study will adopt unit root test, co-integration and error correction model (ECM) techniques to estimate the impact of fertility and women education on economic growth in Nigeria. The use of non- stationary series in a regression equation may generate estimation that are biased. Therefore, the statistical inference drawn from such estimates may not be valid particularly when there is no integration among the variables.

3.5.1 Unit root test

The unit root test will be conducted on all the variables in order to ascertain whether the variables are stationary to determine the order of integration using Argumented Dickey Fuller (ADF) test.

3.5.2 Johansen Co-Integration Test

An attempt shall be made to establish a co- integration relationship between the dependent variables and the explanatory variables. In doing this, the johansen co-integration technique shall be employed. These sterns from the need to integrate short run dynamics with long run equilibrium through the inclusion of an error correction mechanism johansen (1988).

3.5.3 **Error Correction Model (ECM)**

The parsimanian error correction mechanism will be used to show the adjustment process and indicate how the disequilibrium of the previous period shocks adjust into the longrun equilibrium in the current period.

3.6 **Source of Data**

This study will use a secondary data annual data from 1990 to 2018 on variables such as Gross domestic product, female education and female population. It will be source from the central bank statistical bulleting and world development indicator.

CHAPTER FOUR

ANALYSIS OF DATA AND INTERPRETATION OF RESULTS

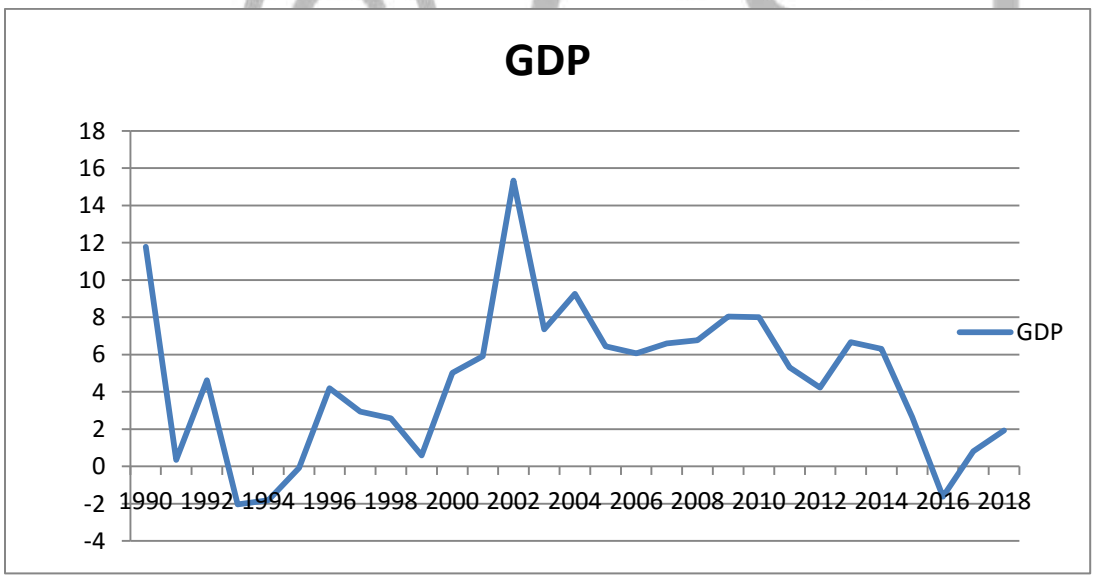
4.0 Introduction

This chapter present the analysis and discussion of the findings on this study. It also concentrates on trend analysis of the variables.

4.1 TREND OF VARIABLES

4.1.1 Figure 1:

TREND OF GDP GROWTH IN NIGERIA (%) (1980-2018).

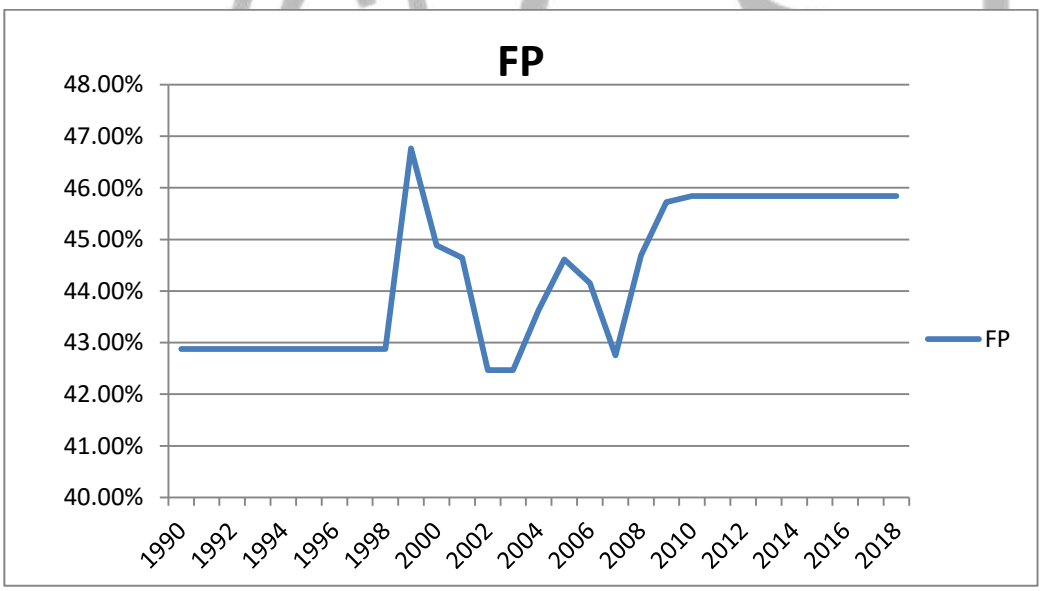


Source: Author's (2020)

Figure 1 shows the trend of GDP growth from 1990 to 2018, on the vertical axis is the rate of growth of GDP in percentage and the horizontal axis is the years .Nigeria's GDP rose to the highest between 2000 and 2004 this is due to boom in the international oil market and rise in the price of oil and was negative from 1992 to 1995 as well as 2015 to 2017, this was due to oil price collapse in the international oil market combined with negative shocks . The GDP growth rate has risen and fallen over the years.

4.1.2 Figure 2

FEMALE POPULATION GROWTH (%) IN NIGERIA (1990 -2018)

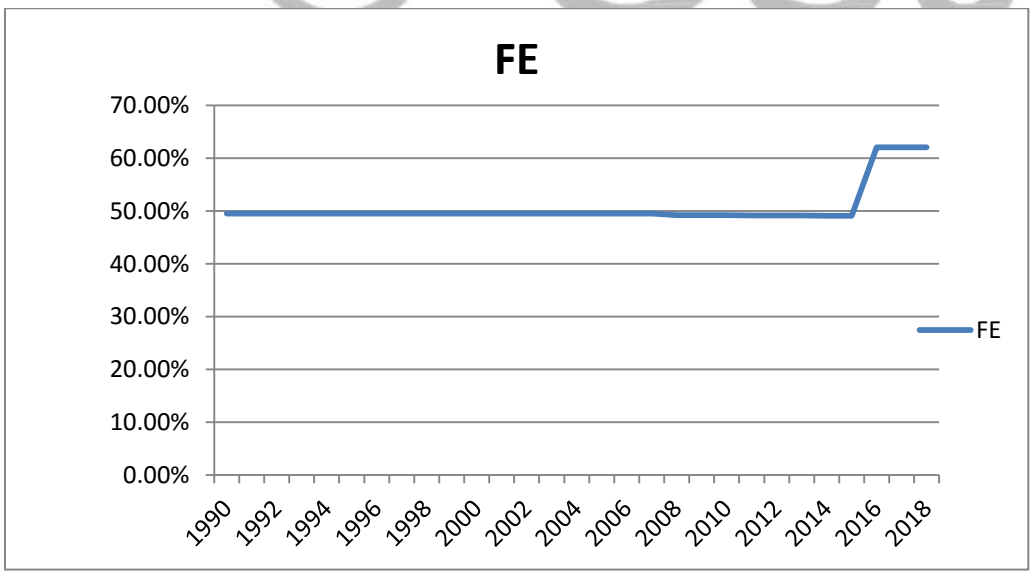


Source: Author's (2020)

Figure 2 shows that the female population grew at an average rate in the early years between 1990 and 1998 and experienced sharp increase till it reach the peak between t 1999 and 2001, this is due to the boom in the economy during this time . The rise in the nation's income reduced starvation, diseases and the existence of proper health care facility encourage reproduction. This proves the Malthusian population trap theory to be true, the theory state that a positive relationship exist between National income and population growth rate.

4.4.3 Figure 3

FEMALE EDUCATION GROWTH RATE (%) IN NIGERIA (1990 -2018)

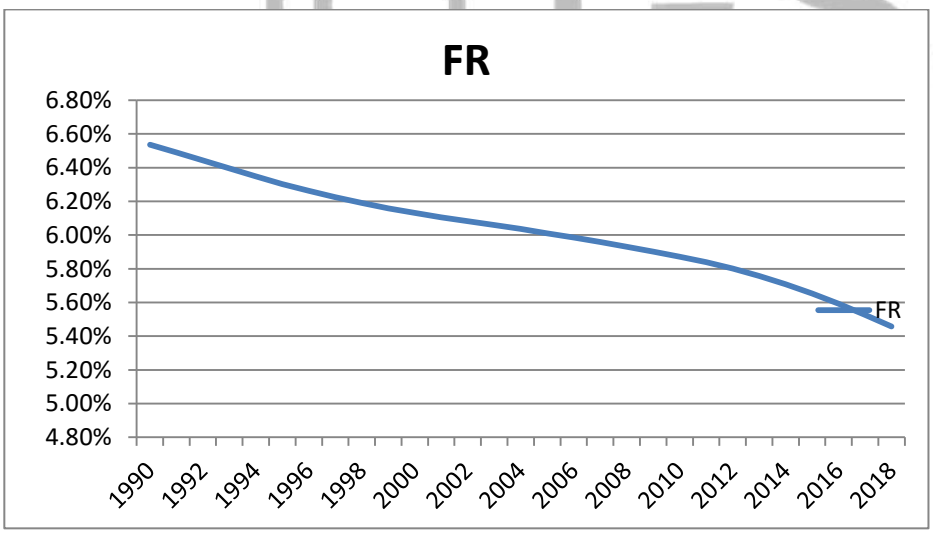


Source: Author's (2020)

The figure shows a stable and consistent growth rate of female education from 1990 to 2014, female education rate however rose gradually from 50% to above 60% from 2014 to 2018. This is due to use of scientific innovation to reduce cost of education, the state government also establish tuition free public primary and secondary schools, this encourage the enrolment of children especially the girl child in school.

4.1.4 Figure 4

FERTILITY RATE IN NIGERIA (1990 -2018)



Source: Author's (2020)

The figure shows steady fall in fertility rate from 6.5% to 5.5% between 1990 and 2018. The steady fall is due to rise in female education which raises the opportunity cost of mother's time , existence of cheap and subsidies education encourage enrolment of female child in school and this reduces the time available for reproduction as well as raise economic and social status of women. Educated women are known mainly to have smaller families.

4.2 ANALYSIS OF VARIABLES

4.2.1 Table 1: UNIT ROOT TEST

Augmented Dickey-Fuller (ADF) Unit-Root Test Statistics

The result of the ADF unit-root test is presented in the tabl

Variables	ADF-test level	5% c.v	10% c.v	ADF-test first difference	5% c.v	10% c.v	Order of integration 1(d)
GDP	-3.4024	-2.9718	-2.6251	---------	---------- ---	--------- ----	I(0)
FR	1.8384	-2.9862	-2.6326	-3.4205	-2.9862	-2.6326	I(1)
FP	-0.3346	-2.9718	-2.6251	-3.5982	-2.9810	-2.6299	I(1)
FE	-2.0915	-2.9718	-2.6251	-6.0158	-2.9762	-2.6274	I(1)

Source: Author's computation 2020.

The result showed that gross domestic product (GDP) is stationary at level 1(0) at 5% and 10% level of significant while fertility rate (FR), female population (FP), and female education (FE) are stationary at first difference I(1) at 5% and 10% level of significance. Since there are mixtures of I(0) and I(1) variables , Johansen co-integration methodology cannot be utilized. The method of Autoregressive Distributed Lag model (ADRL) will be adopted and bound test will be used to capture the presence of co-integration.

4.2.2 Table 2: BOUND COINTEGRATION TEST

Null Hypothesis: No long run relationship exist

From table 2, the computed F-stat of 11.35994 is greater than the Upper Bound table value at 10% and 5% level of significant.

Calculated F – statistic 11.35994, k=3		
Critical	**Lower bound**	**Upper bound**
10%	2.72	3.77
5%	3.23	4.35
2.5%	3.69	4.89
1%	4.29	5.61

Source: Author computation 2020

The study rejects the null hypothesis .This is interpreted as there is long-run relationship among the variables. This implies that we may proceed to the long run analysis and the short-run dynamic and error correction analysis.

4.2.3 Table 4: CO-INTEGRATING (LONG RUN) COEFICIENTS

Dependent Variable: GDP

From table 4, the coefficient of fertility rate (FR) is negative and statistically significant, showing an indirect relationship exists between fertility rate and gross domestic product.

Long run coefficient				
Variable	Coefficient	Std Error	T-statistic	Prob
FR	-9.7572	2.8340	-3.4428	0.0033
FE	0.0099	0.5646	0.0176	0.9862
FP	-0.1817	0.1123	-1.6174	0.1253
C	80.6229	43.2968	1.8620	0.0811

Source: Author computation 2020

A unit increase in fertility rate will decrease GDP by about -9.7572 units.

The coefficient of female education is positive and significant, showing a direct relationship between female education and gross domestic product that is a unit increase in female education increases GDP by about 0.0099 units.

The coefficient of female population (FP) is negative and statistically insignificant, showing an indirect relationship exists between female population and gross domestic product. A unit increase in female population will decrease GDP by about -0.1817 units.

4.2.4 Table 5: THE SHORT-RUN DYNAMIC AND THE ERROR CORRECTION MODEL

Dependent Variable: GDP

From table 5, the result showed that in the short run, the coefficient of female education and female population are negative, in which one is significant and other insignificant respectively at 5% level of significance.

Long run coefficient				
Variable	Coefficient	Std Error	T-statistic	Prob
D(FR)	297.3320	49.1949	6.0439	0.0000
D(FE)	-1.0803	0.4176	-2.5865	0.0199
D(FP)	-0.2441	0.1612	-1.5144	0.1494
ECM(-1)	-1.3431	0.1911	-7.0264	0.0000
R-square 0.8230, Adjusted R-square 0.7235, F- stat 8.2716				

Source: Author Computation 2020

The coefficient of Fertility rate is positive and significant at 5% level of significance.

The adjusted R^2 and F-statistic indicated that the model is strongly significant in explaining the variations in economic development to the tune of 72.35% (i.e. 72.35% of the variations in gross domestic product is explained by fertility rate, Female education and Female population.

The result in the table indicate that the coefficient of the error correction term ECM (-1) has the correct sign and significant at 5% level. The value of the coefficient is, -1.3431 that means about 134% of the disequilibria in real GDP of previous year's shock adjust back to the long run equilibrium in the current year. in another word, real GDP adjust to equilibrium with a lag

4.2.5 Table 6: AUTOCORRELATION TEST

The null hypothesis is that, there is no autocorrelation in the error terms versus it alternative hypothesis of serial dependence among the error terms.

F-statistic (p value)	3.9734 (0.044)
Obs*R-squared (p value)	9.4145 (0.009)

Source: Author's computation 2020

The F-statistics in the result of the autocorrelation test has a probability value of 3.973 (397%) which is greater than 5% level of significance, hence the null hypothesis of no autocorrelation is accepted, hence the result of this analysis is reliable and free from serial error correlation.

4.2.6 Table 7: HETEROSCEDASTICITY TEST

Heteroscedasticity Test Breusch Pagan Godfrey

The null hypothesis is that, there is homoscedasticity of variance against its alternative of heteroscedasticity of variance .

F-statistic (p value)	0.678278 (0.7179)
Obs*R-squared (p value)	7.180308 (0.6184)

Source: Author's Computation 2020

The F-statistics in the result has probability value of 0.6782 (67.82%) which is greater than 5% level of significance, hence the null hypothesis of homoscedasticity is accepted, therefore the result of this analysis is reliable and free non constant variance.

4.2.7 Table 8: STABILITY TEST

The null hypothesis is that, the regression model fit the data well versus its alternative hypothesis of invalid regression model.

F-statistic (p value)	0.7830 (0.390)
T-statistic (p value)	0.8849 (0.390)

Source: Author's computation 2020

The F-statistics in the result has a probability value of 0.783 (78%) which is greater than 5% level of significance, hence the null hypothesis that the regression model fit the data well is accepted, hence the parameter estimate in this model are stable over time.