

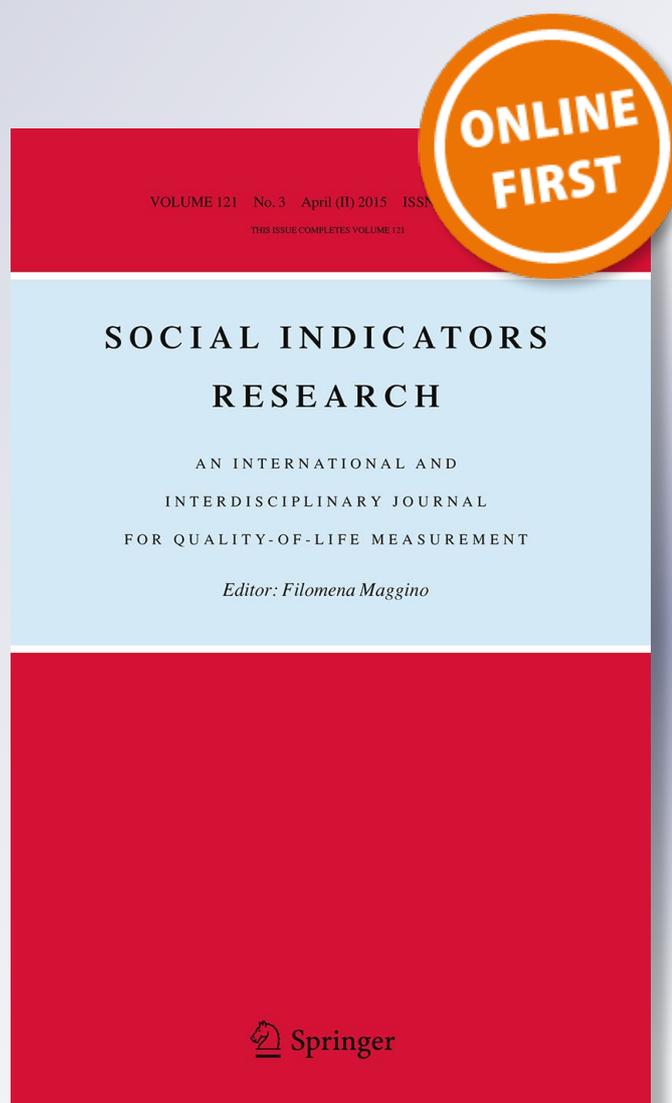
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Gender Inequality, Maternal Mortality and Inclusive Growth in Nigeria

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Abstract

The relevance of women in contributing to inclusive growth and consequently economic development in Nigeria cannot be overemphasized. Women play important social, economic and productive roles in any economy. Maternal mortality rate refers to the annual number of deaths of women from pregnancy-related causes per 100,000 live births, and Nigeria's rate is still relatively high at about 630 when compared with the figures of the developed countries. For inclusive growth to be achieved in Nigeria, women should not be neglected and marginalized so they can contribute their quota to the growth of the country, but maternal mortality rate needs to be reduced because it is only the living that can make contributions to growth. Thus, this study examined the long run effect of gender inequality, maternal mortality and inclusive growth in Nigeria using time series data spanning from 1985 to 2017, and employed the ARDL econometric technique. The results showed that gender inequality and maternal mortality have negative impacts on inclusive growth in Nigeria. Therefore, the study recommends that women should be properly taken care of during pregnancy so that the maternal mortality rate can be reduced and hence they will be able to make meaningful contributions to the growth of the Nigerian economy.

Keywords Inclusive growth · Maternal mortality rate · Women

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1 Introduction

There are different opinions formed by different people about the term 'inequality'. It is perhaps an important factor that gives rise to a wide range of social ills such as educational disadvantage, health inequalities, inter-generational immobility and crime which may weaken social unity. It relates with economic performance but in a much more complex fashion than a simple trade-off between growth and inequality (Nolan 2009). The continual of inequality constrains a society's productivity and ultimately slows its rate of economic growth and the economy pays for this in reduced productivity today and diminished national output tomorrow (Awoyemi 2004). Since the early 1980s, rising inequality in earnings and household income has been a focal policy issue (Scholtz 2010; Bluestone and Harrison 1982; Dooley and Gottschalk 1982, 1984; Ryscavage 1994).

In Nigeria, the inequality level is said to have worsened and many studies using household income and consumption survey, document this fact, for example, Aighbokan (2000) showed increasing levels of inequality, poverty and polarization using nationwide surveys for 1985/86, 1992/93 and 1996/97 with the inequality level ranging between 22% in 1985/86, 23.5% in 1992/93 and rising to 25% in 1996/97 in Nigeria. A much earlier study by Canagarajah et al. (1997) discussed rising inequality situation for Nigeria and reported increased inequality spanning 1980s and 1990s with the figure ranging between 22% and 24% in 1980 and 1990 respectively in Nigeria. Despite this recognition in both academic and policy circles, "gender issues are often excluded from the design and planning of empirical research and data collection both at the micro and macro levels. There is also an unbalanced analysis of women's roles, responsibilities, constraints and opportunities in different activities in relation to those of men" (Ajani 2008:10). It is observed from literature that women are still downgraded in Nigeria because of the cultural beliefs prevalent in the country (Ajani 2008).

In analyzing the inequalities in gender statistics, National Population Commission (2014) submitted that household expenditure by family heads was on food, of which female-headed families spend more. Likewise, the females are generally regarded and known as lacking in wealth factors such as land, buildings, investments and other valuable properties. In fact, those that are widows lose a lot of their wealth to husbands' death because of the culture subsisting in their locality. As few as 20% are engaged in industry and agriculture while majority are into buying and selling; whereas men are into industry and agriculture, majority of the women also, are students, retired and unemployed. This places them outright as absolutely poor especially with the unequal dispositions to income resources, health, education and home, and other infrastructures that make life conducive. Several studies (such as Aigbokhan 2000; Oyekale et al. 2010; Leong 2013; Anandi 2014) have identified inequality in various facets as responsible for the experiences of many that are either deprived or socially excluded. Inequality is noticed in the area of trading, financial systems, social, economic as well as dependency on economic inter-relationships between developing and developed nations (CBN and World Bank 1999; Aigbokhan 2000). The challenge is further emphasized given the following statistics; out of about 187 countries in human development index (HDI) programme that are ranked, Nigeria is 152nd, and proper observation indicated that in all the indices considered, Nigeria happened to record

a low performance consistently. For instance, Nigeria's HDI was 2.6 in 1985; it was 2.7 in 2010 and slightly increased to 2.9 in 2015 (UNDP 2015; Alao 2015).

Maternal mortality is the most important indicator of maternal health and well being in any country (HERFON 2006). From recent estimates, the number of deaths each year from maternal cases worldwide decreased from 536,000 in 2005 to an estimated 358,000 in 2008 and 273,500 in 2011 and further reduced to 271,800 in 2016. For every woman that dies, approximately 20 more suffer injuries, infection and disabilities in pregnancy or childbirth (IHME 2012; UNICEF 2008a, b; WHO 2007). Even though maternal mortality is a worldwide phenomenon, the critical issues associated with it are most profound in developing countries. Hence, of the estimated figure for maternal deaths worldwide, developing countries account for 99% (WHO 2008); with an estimated 265,000 maternal deaths occurring in sub-Saharan Africa (UNICEF 2008a, b). The situation is even more alarming in Nigeria. For example, in the year 2000, the maternal mortality ratio per 100,000 live births was 800 compared to 540 for Ghana and 240 for South Africa. However, by 2003, the maternal mortality ratio in Nigeria had risen to 948/100,000; in 2005 it was 1100/100,000 and 840/100,000 live births in 2008, while Nigeria Demographic Health Survey (NDHS) 2008 has put it at 545 per 100,000 live births (UNICEF 2010; Zozulya 2010; NDHS 2008; Ogunjuyigbe and Liasu 2007).

It has been observed that the chance of a Nigerian woman dying from reproductive health disorders and complications was put at 1 in 10 in 2002, 1 in 18 in 2005, and 1 in 23 in 2008, placing the Nigerian woman at far greater risk than her counterpart in the developed world, where the risk is estimated to be 1 in 17,800 and 1 in 10,000 in countries such as the Republic of Ireland and Singapore respectively (World Bank 2011; UNICEF 2010; Media Global 2010; UNICEF 2008a, b; UNFPA 2005a, b). Some of the implications of these estimates are the depletion of the country's workforce and the overall stifling of rapid development. Studies have shown that despite the differences in maternal mortality ratio between developed and developing nations, the pattern of maternal mortality did not change over the years (Singh et al. 2013; Idowu 2013; Alao 2015). Still, the most common medical causes are haemorrhage, hypertensive disorders, infection, unsafe abortion, obstructed labour and sepsis.

Bushan (2013) argued that a precise definition of inclusive growth may not be obtained offhand as people's perception of inclusive growth vary, however, he suggested five elements which must be identified in any meaning given to inclusive growth. The elements are; the outcome that inclusive growth seeks to achieve, clear-cut definition of the approach to measuring inclusive growth, a simple working definition of inclusive growth and results expected, the bottom line is that for growth to be inclusive, the consumption by the excluded 20 percent must also increase by at least, the same rate as growth. Bushan's summary of inclusive growth is an inclusive growth environment, in which the welfare of excluded people improves faster than the average incomes in the country. Inclusive growth as described by Ianchovichina and Lundstrom (2009) has several facets to it such as 'broad-based growth', 'pro-poor growth' or 'shared growth'. Thus, the definition is captured as inclusive growth that allows people to contribute to and benefit from economic growth (Matthew et al. 2010; Ejemeyovwi et al. 2018; Matthew et al. 2019).

In considering inclusive growth, Chakrabarty (2010) opined that inclusive growth has two facets, that of pace and the pattern of economic growth. Thus, he defined inclusive growth as a strategy of economic development' and growth being 'inclusive when it creates economic opportunities along with ensuring access to them. Applying this framework takes care of inequalities in providing for improved education, health care for all and good living standards. The strategic approach to doing this is focusing a sustained and inclusive

economic growth programme for 2015 and beyond in Nigeria. As presented in the framework of the three authors, inclusive growth needs to be fast, directional, paced, and also follow a determined pattern of growth which must be appraised for effectiveness from time to time (Ejemeyovwi et al. 2018). Depending on strategies adopted, pro-poor growth will reduce inequality (Melamed and Bergh 2014). Thus, as gender inequalities in education, employment and other growth indices are reduced, growth will also increase.

Therefore, this study was motivated to examine how reduction in gender inequality and maternal mortality will help achieve inclusive growth in Nigeria, given the fact that, women are often times neglected in the society. In view of the foregoing, the objective of this study is to examine the relationship between gender inequality, maternal mortality and inclusive growth in Nigeria using the ARDL econometric technique. The hypothesis of this study is formulated in the null form viz; H_0 : There is no significant relationship between gender inequality, maternal mortality and inclusive growth in Nigeria. Thus, this study is structured into five sections viz: following this introductory section is section two which draws insight from relevant literature; section three comprises of the methodology employed and results; discussion of results and the summary of findings are presented in section four, while recommendations and conclusion are presented in section five.

2 Literature Review

Gender inequality and poor women empowerment retard improvement in living standards of women and act as a clog in their contributions to governance and economic development. In other words, gender equality empowers the transformation of women to access education, health, micro finance credit and recognition among other productive resources. Gender inequality lowers the quality of life and culminates in limited productivity, hinders economic efficiency and growth (Leong 2013; Alao 2015). The benchmark for a successful society is the level of gender equality which reflects on the extent of women's rights and empowerment in that society. Men and women have roles to play in societal development, yet women all over the world are grossly marginalized. According to Singh and Gupta (2013), women comprise half of human resources and they have been identified as key agent of sustainable development. According to Makama (2013), gender inequality refers to disparity and discrimination of rights, responsibilities and opportunities that all persons should enjoy, regardless of whether one is born male or female. Gender differences in terms of income, wages, skill, health, wealth and poverty has broadened the gaps in developing countries because women do not have access and control over the benefit from economic opportunities and resources.

Maternal mortality is still a severe concern for Nigeria today, particularly in the rural southern and northern parts of Nigeria. In 2005, the estimated aggregate of worldwide maternal deaths recorded was 536,000; developing nations, for example, Nigeria, represented more than 99 percent or 533,000 of the recorded maternal deaths (WHO 2007). Nigeria's maternal death rate surpasses 1000 deaths per 100,000 live births and is substantially greater than the African continent average which is 800 deaths per 100,000 live births (Zozulya 2010). However, the larger part of maternal death rate happens in rural communities in developing nations. In some cases, regardless of whether there is an existing health-care infrastructures that provides quality health care to these communities, most of these women do not have the resources or means to access it. This is one of the three delays that have been regularly documented by maternal mortality studies done in recent years. These

delays include the following; “delay in decision to seek care, delay in reaching care, and delay in receiving adequate care” (Smith-Fawzi 2011:68). Inclusive growth involves a long term perspective. It centres on the age of gainful employment, rather than direct income redistribution, so as to increase the earnings of excluded groups. Some redistribution plans may however be fundamental in the short term (Ianchovichina and Lundstrom 2009).

Inclusive growth is “growth that not only makes economic opportunities, but also one that guarantees equal access to the prospects created for all divisions of society, especially for the poor people” (Ali 2007:1). Inclusive growth includes but extends pro-poor development; it involves ‘expanding the size and economic echelons of the average class’. The presumption is that development which is gainful for the large majority of people in developing countries is more likely to be politically and economically sustainable (Birdsall 2007; Adediran et al. 2017). According to OECD (2008), inclusive growth is economic growth that ensures equity in opportunities, employment opportunities and poverty alleviation. Inclusive growth uses a long term view and is concerned with sustainable growth. Inclusive growth based on equal opportunity differentiates inequalities because of individual circumstances from those due to individual efforts. The education of women and the reduction in the maternal mortality rate have been found to have a positive effect on inclusive growth since women also have been found to attain the educational height their male counterparts have attained (Birdsall 2007). Sede and Izilien (2014) examined the impact of maternal mortality on economic growth in Nigeria using the Grossman death model. They found out that the education of women helps in the reduction of maternal mortality rate which boosts Nigeria’s economic growth.

It has been observed that one of the reasons that break the chains of poverty is education and this leads to the transformation, advancement and progress of the economy (Ikoni 2009; Salau et al. 2018). According to the United Nations Human Development Report (2005), Nigeria was categorized as a low improvement country in regard of equality in educational accessibility educational facilities are generally believed to be insufficient, and access, constrained for many, particularly young ladies and women (Uku 1992). However, Omolewa (2002) demonstrates that this inequality has its root in the colonial system of education which was primarily geared toward meeting the need of manpower of the colonial government that clearly distanced ladies from educational and economic opportunities. Women in Nigeria are harder-hit by poverty than men because of the non-challant emphasis placed on female education, and the dominance of early marriage which have a tendency to further ruin the womenfolk, and subject them to statutory discrimination (Ojo 2002; Matthew et al. 2018; Afolayan et al. 2019).

By virtue of the Nigerian population, the potential female work force is 50% but the actual value in real life has been about 31%. The percentage of women in the formal sector is very low. This is seen in the industries and the civil services; statistics shows that in the Federal Civil Service, which is the uppermost employer of labour in the country, women are generally found in the junior categories of jobs (Ajir 2002). Women are mostly involved in all forms of petty trading and street hawking in urban areas. According to Statistics, 78% of the female gender is mainly involved in informal sector, which includes petty trading and farming. Irrespective of this, their contribution is not commensurate monetarily. The women’s unpaid job is twice that of the male gender, and its economic value is projected to be up to 30% of the Gross National product of Nigeria (UNDP 2015). Nigerian women, similar to their counterparts around the world, confront a ton of discrimination that limits their chances to develop to their full capacity on the basis of equality with men. They seldom benefit from equal rights in the labour market; this is due to their domestic burden in the homes, little or no education, poverty, pre-dispositions against the female gender

employment in specific branches of the economy or kinds of work and poor salary structures (Ojo 2002; Matthew et al. 2018).

The impact of gender inequality and maternal mortality on inclusive growth in Africa using panel data approach was examined by Adedeji et al. (2013). They found out that high growth in selected African countries resulted in increased average opportunities in education and health for women. However, the distribution of the opportunities varied across countries depending on the country specific policies. They also noted that for inclusive growth to be attained, efforts need not be spared to fulfil the goals of holistic education, health, improved living standards in all sectors that touch on poverty. Alao (2015) examined how inequality and poverty among women and youths impact on inclusive growth in Nigeria using descriptive statistics. The study found out that poverty in Nigeria is not affected due to mis-direction of programmes from rural to urban areas, inadequate funding, lack of control, transparency and accountability and inadequate coverage of the poor. In addition, inequality and poverty was found to be predominant among women and this have an adverse effect on Nigeria's inclusive growth.

The several Nigerian constitutions have ensured that women be given the privilege to take part in active politics; however, this last decade has observed a relative increment in women's participation. This only comes to light when we measure the increase in participation with specific benchmarks such as the number of women who vote during elections; public offices held by women, amongst others. Over the years, there has been a noteworthy increment in women's participation in government in Nigeria considering these benchmarks, yet there is intrinsically a high level of under representation of women in government and politics as when compared with their male counterparts (Nkechi 1996). Women's aspiration to participate in politics is premised on the following ground; that Nigeria women represent half of the populace and consequently ought to be allowed a fair share in decision-making and the governance as regards the country development. Secondly, that every person be treated equal and the female gender possess the same rights and privileges as men to participate in governance, politics and public life. The right to democratic governance is an entitlement conferred upon all citizens by law.

In Nigeria, for the past 10 years, there have been many cases of women's rights violation such as rape, widow abuse, murder of women and other physical assaults but its only life-threatening cases of women's rights violation that media and police pay more attention and interest to. Some crucial and vital cases like marital rape, female circumcision, emotional abuse, termination of employment as a result of pregnancy, wife battery and sexual harassment are not usually seen as problems to be taken serious by media and also by the police (Salaam 2003). Majority of the individuals who are victims of domestic violence and rape find it difficult to report to appropriate authorities. In Nigeria, based on the tradition, culture and religious beliefs, the women or wives are seen as properties of their husbands and their husbands have the moral right to beat their wives as a form of correction for insubordination and doing something wrong, and in the case of rape, women keep mute because they see it as a social stigma if it comes to the knowledge of the public (Ogunjuyigbe and Liasu 2007).

Thus, the major contribution of this study to literature is that the authors have brought to limelight the relevance of gender inequality and maternal mortality on inclusive growth in Nigeria, thereby adding to the existing body of knowledge in this area.

3 Methodology

3.1 Data Measurement and Source

Tackling gender inequality needs an all-of-government and all-of-society approach, taking into account the established linkages between women’s social wellbeing and economic opportunities for more productive lives (Akor 2012). This forms the motivation for this study. Data for the study was sourced from the World Development Indicators (WDI 2017) and United Nations Development Programme (UNDP) for the period of 38 years (1980–2017). The study engaged seven variables: inclusive growth proxied by the growth rate of gross domestic product (GDP), maternal mortality rates, infant mortality rates, inequality, female primary education attainment and female secondary education attainment and female labour force. The description of the variables is presented in Table 1.

3.2 Model Specification and Estimation Method

This study adopted the functionalist theory of inequality which believes that society functions so that each individual plays a specific role. The perspective of this theory is that “inequality” is equality necessary for the smooth functioning of the society, thus the justification upon which the model is formulated. The model for this study is closely related to the study of Osabohien et al. (2018). Hence, the baseline model for this study is specified as:

$$Y = f(A, X, Z, T) \tag{1}$$

where $Y = GDPGRPC_t$; $A =$ mortality components (maternal mortality rates and infant mortality rates); $X_t =$ inequality; $Z_t =$ educational components (female primary school and secondary school attainments) and $T =$ female labour force participation. Equation (1) is implicitly specified incorporating the variables as:

$$GDPGRP = f(MMR, INFMR, INEQ, PRIMEDU, SECEDU, FLABF) \tag{2}$$

Equation (2) can be explicitly specified as

$$GDPGRPC_t = \beta_0 + \beta_1MMR_t + \beta_2INFMR_t + \beta_3INEQ_t + \beta_4PRIMEDU_t + \beta_5SECEDU_t + FLABF_t + \varepsilon_t \tag{3}$$

where: $GDPGRPC$ is the dependent variable representing gross domestic product growth rate per capital, MMR represent maternal mortality rates, $INFMR$ represent infant mortality rates, $INEQ$ represent inequality, $PRIMEDU$ represent share of female primary education attainment, and $SECUDU$ represent proportion of female secondary school attainment. The model for this study is hinged on Schumpeterian growth theory (as used in Ejemeyovwi et al. 2018), which emphasises that inclusive growth is for the benefit of all. $FLABF$ means female labour force participation; β_0 is the constant term, $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ are the coefficients of the exogenous variables, t represent time, while ε represents the stochastic term. The method employed for the analysis is the Autoregressive Distribution Lag (ARDL) approach to cointegration, which aimed at examining how inclusive growth will be achieved in the long-run, given the reduction in maternal mortality rate, infant mortality rate and gender inequality in Nigeria, thus the ARDL model which drew insight from the empirical work of Osabuohien et al. (2018) is specified as

Table 1 Variable description and source. *Source:* Authors' compilation, 2019

Identifier	Variable	Measurement/proxy	Source
<i>GDPGRPC</i>	Inclusive growth	Growth rate of gross domestic product per capita	World development indicators (WDI 2017)
<i>MMR</i>	Maternal mortality rate	Maternal mortality ratio (national estimate, per 100,000 live births)	World development indicators (WDI 2017)
<i>INFMR</i>	Infant mortality rate	Mortality rate, infant (per 1000 live births)	World development indicators (WDI 2017)
<i>INEQ</i>	Gender inequality	The measure of the disparity and discrimination of rights that all persons should enjoy, regardless of whether one is born male or female	United nations development programme (UNDP)
<i>PRIMEDU</i>	Female primary education attainment	Primary education, pupils (% female) (modeled ILO estimate)	World development indicators (WDI 2017)
<i>SECEDU</i>	Female secondary school attainment	Secondary education, pupils (% female) (modeled ILO estimate)	World development indicators (WDI 2017)
<i>FLABF</i>	Female labour force participation	Labour force, female (% of total labour force)	World development indicators (WDI 2017)

$$\begin{aligned} \Delta GDPGRPC_t = & \beta_0 + \sum_{i=1}^n \beta_1 \Delta MMR_{t-1} + \sum_{i=0}^n \beta_2 \Delta INFMR_{t-1} + \sum_{i=0}^n \beta_3 \Delta INEQ_{t-1} \\ & + \sum_{i=0}^n \beta_4 \Delta PRIMEDU_{t-1} + \sum_{i=0}^n \beta_5 \Delta SECEDU_{t-1} + \sum_{i=0}^n \beta_5 \Delta FLABF_{t-1} + e_t \\ & + \gamma ECM_{t-1} + e_{t-1} \end{aligned} \tag{4}$$

where Δ is the change in operator and the ECM_{t-1} represents the correction mechanism of the stochastic term. γ means the adjustment rate. That is, how fast the system adjust to equilibrium in the event of shock (Osabuohien et al. 2018).

The hypothesis is stated thus:

H₀ $\beta_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6$ (No long run relationship exist)

H₁ $\beta_0 \neq \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6$ (Long run relationship exist)

Thus, the *a priori* expectation of the variables is that: $\beta_1 < 0, \beta_2 < 0, \beta_3 < 0$, while $\beta_4 > 0, \beta_5 > 0$. This implies that the signs of the coefficient of the independent variables (maternal mortality rates, infant mortality rates and inequality) should be negative, which means that, increase in the rate of inequality, maternal mortality and infant mortality has a reduction effect on inclusive growth in Nigeria, while female educational (primary and secondary school) attainment are expected to have a positive effect on inclusive growth in Nigeria, this implies that, increased female education will invariably increase their chances of been employed in the labour market which will stimulate productivity in the economy. The major justification for the use of ARDL econometric approach to cointegration is that; unlike the traditional (the Johansen) cointegration approach, the ARDL is efficient when the variables have difference level of stationary, that is, when the variables are stationary at order zero [I(0)] and order one [I(1)], in this case, the traditional approach to cointegration is no longer feasible, therefore the ARDL is more efficient is handling this situation (Osabohien et al. 2018a, b; Pesaran et al. 2001).

4 Results and Discussion

4.1 Summary Statistics of Variables and Unit Root Test for Stationarity

The statistical results of the selected variables from the analysis are presented in Table 2. The results in Table 2 reveals the summary statistics of the variables. The variables in the

Table 2 Summary statistics of variables. *Source:* Authors' computation, 2019

Variable	Mean	Standard deviation	Minimum	Maximum
Gross domestic product per capita	0.8976	7.3173	- 15.4547	30.3565
Maternal mortality rate	487.6017	32.2590	433.1972	586.2819
Infant mortality rate	0.6687	0.0819214	0.52934	0.8162
Inequality	404.4847	18.8786	362.5464	424.8765
Female educational attainment, primary	427.773.8	94,674.10000	292,821	5991
Female educational attainment, secondary	41.48332	6.102479	25.55539	46.8599
Female labour force participation	3.774365	0.0264881	3.743475	3.816365

model are gross domestic product per capita, maternal mortality rate, infant mortality rate, inequality, female educational attainment, primary female educational attainment, secondary, and female labour force participation. The mean values of the variables show that they are appropriate, the median, standard deviation, minimum and maximum values of the variables showed that they are good statistical measures. After the summary statistics of the variables, the unit root test was conducted using the Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) to determine the order of stationarity of the variables (see Table 3). Before conducting the ARDL, it is necessary to know how the variables trend, otherwise, ARDL may not be applicable (Pesaran et al. 2001).

From the results in Table 3, it could be observed that the variables are integrated in either order 1 or order 0, which forms the justification of the use of the ARDL approach. Gross domestic product per capita growth rate and maternal mortality rate are integrated at order 0 [that is, I (0)], while infant mortality rate, inequality, female educational attainment, primary, female educational attainment, secondary educational attainment, female labour force participation are integrated at order 1 [that is, I (1)], for both the ADF and PP method; hence, ARDL is applicable for the analysis (see Table 3).

4.2 ARDL Results

This section of the study presents the estimates as obtained from the ARDL results. Before, the conduct of long-run relationship, the Bound test was carried out to examine whether long-run relationship actually exist among the variables, and from the Bound test, it can be inferred that there is the existence of long-run relationship between the variables (see Table 4).

Table 4 shows that there is the presence of long run relationship among the variables. This is based on the fact that, the values of the F-statistic (5.8845) is greater than the values in both the upper and the lower bounds, therefore, the ARDL long run relationship is conducted as presented in Table 5.

The results in Table 5 revealed that in the long run, maternal mortality rate will reduce inclusive growth by 33.07%, infant mortality will reduce inclusive growth by 15.08% and inequality will reduce inclusive growth by approximately 25.35%. Female primary and secondary schools education attainments will spur inclusive growth by over 70%, and female labour force participation will enhance it by approximately 10.50%. From Table 5, the R-squared of 0.874439 showed that the model is well fitted. This implies that about 87.44% variations are explained in the model. Prob (F-statistic) of 0.004480 showed that, jointly the variables are statistically significant at 1% level, while Durbin-Watson statistic value of 3.207380 showed that there is no autocorrelation in the model. To prove that the results obtained are not '*spurious or nonsensical*', post estimation tests were conducted using various diagnostic tests as presented in the results in the appendix.

The results from the Ramsey RESET Test for Omitted Variable Bias showed that the model specified did not suffer from omitted variable, this is based on the probability (0.7513) and the T value (0.7513), given the fact that they are statistically insignificant (see "Appendix 1"). Also, the results obtained from the correlation test which showed that there is no autocorrelation in the model, given the fact that the Prob* values are not significant (see "Appendix 3"). Lastly, there is homoscedasticity (absence of Heteroskedasticity) in the model based on the F-statistic 0.5720 which is not significant, this showed that there is no multicollinearity as well, because; the values are less than 0.8 (see "Appendix 4").

Table 3 Unit root test for stationarity. Source: Authors' computation, 2019

Variable	ADF test statistics	Critical values:			PP test statistics	Critical values:			Remark		
		@ 1%	@ 5%	@ 10%		@ 1%	@ 5%	@ 10%			
Gross Domestic product per capita	-4.53111	-3.62678	-3.62678	-2.9458	Stationary	-2.6115	-3.626	-2.945	-2.611	1(0) Level	Stationary
Maternal mortality rate	-3.3727	-3.6267	-2.9458	-2.6115	Stationary	-3.3586	-3.626	-2.945	-2.611	1(0) Level	Stationary
Infant mortality rate	-6.5420	-4.2732	-3.557	-3.2123	Stationary	-9.8708	-4.243	-3.544	-3.204	1(1) at 1st difference	Stationary
Inequality	-5.444	-4.252	-3.207	-3.207	Stationary	-6.995	-4.243	-3.544	-3.204	1(1) at 1st difference	Stationary
Female educational attainment, Primary	-6.1496	-4.273	-3.557	-3.212	Stationary	-11.038	-4.262	-3.552	3.209	1(1) at 1st difference	Stationary
Female educational attainment, secondary	-2.7921	-1.977	-1.602	-1.6020	Stationary	-2.872	-2.740	-1.968	-1.604	1(1) at 1st difference	Stationary
Female labour force	-2.656	-1.954	-1.609	-1.699	Stationary	-4.356	-3.595	-3.233	-2.749	1(1) at 1st difference	Stationary

ADF augmented Dickey-Fuller, PP Phillips-Perron

Table 4 ARDL bound test. Source: Authors' computation, 2019

Test statistic	Value	K
F-statistic	5.8845	6
Significance	I(0) bound	I(1) bound
<i>Critical value bounds</i>		
10%	2.12	3.23
5%	2.45	3.61
2.5%	2.75	3.99
1%	3.15	4.43

I(0) represents lower; I(1) represents upper

Table 5 Estimates from long-run ARDL. Source: Authors' computation, 2019

Variable	Coefficient	Standard. error	t-Statistic	Prob.*
GDPGRPC(- 1)	-0.031839	0.104509	-0.304649	0.7684
Maternal mortality rate	-0.330723	0.100214	-3.300166	0.0109
Infant mortality rate	-0.150757	0.146505	-1.029022	0.3336
Inequality	-0.25354	77.05443	1.910797	0.0924
Female primary education attainment	0.968745	2.407168	4.024419	0.0038
Female secondary education attainment	0.743383	0.291875	-2.546922	0.0343
Female labour force	0.104997	5.546509	-1.893039	0.0950
C	189.3395	159.5009	1.187075	0.2692
R-squared	0.874439	Mean dependent var -0.205724		
Adjusted R-squared	0.764573	S.D. dependent var		7.185538
S.E. of regression	3.486479	Akaike info criterion		5.642514
Sum squared resid	97.24426	Schwarz criterion		6.028809
Log likelihood	-37.14011	Hannan-Quinn criter.		5.662296
F-statistic	7.959163	Durbin-Watson stat		3.207380
Prob(F-statistic)	0.004480			

5 Recommendations and Conclusion

Gender inequality is costing sub-Saharan Africa on average \$US95 billion a year, peaking at US\$105 billion in 2014 or 6% of the region's GDP, jeopardizing the continent's efforts for inclusive human development and economic growth (UNDP 2015). It is widely believed that economic growth is the primary driver of poverty reduction which leads to inclusive growth, yet in Nigeria, despite a decade of significant growth and bountiful natural resources, 67% of the population were estimated to live in abject poverty in 2011, while wealth and gender inequality have been on the rise. This stands in contrast to the huge gains in poverty alleviation and inclusive growth agenda in Asia, for example; China and India, which have seen more success toward achieving the Sustainable Development Goal

(SDG) and inclusive growth. This study features a literature review which underwent a content analysis to address the problem of the study, bearing in mind that inclusive growth-based is on gender equality. This review included the HDI education index for Nigeria and the Gender Development Index, which showed an intensity of deprivation for Nigeria at 55.2% for 2013, comparatively high for how wealthy the nation is.

Based on the findings of this study, the following recommendations are made; first, the Nigerian government should ensure that maternal mortality and infant mortality rates are reduced as much as possible via the provision of good healthcare services for pregnant women and infants so that the lives of both the newborn babies and their mothers will be prolonged. This will have a positive impact on inclusive growth and thus the economic development of Nigeria. This study found out that efforts made towards gender equality and mortality reduction in Nigeria are generally ineffective, mainly due to the misdirection of programmes from rural to urban areas, inadequate funding, lack of control, transparency and accountability as well as inadequate coverage of the poor (Matthew et al. 2018; Osabohien et al. 2018a, b; Akor 2012). The 2012 Gender in Nigeria Report launched recently showed that gender inequality not only exists in the country, but at highly worrying levels (Akor 2012).

Second, the girl child is as important as the male child, hence, in order to reduce the inequality rate in Nigeria, women should be given equal opportunities and privilege as their male counterparts. Today, there are women that are renowned medical doctors, engineers, pilots, accountants, architects, business moguls amongst others. Coupled with this, is the fact that the government should encourage the education of the girl child and not push them to early marriage at the expense of their education. Women should also be given the opportunity to contribute their quotas to Nigeria's economic growth via their productivity. Third, the Nigerian government should discourage gender inequality via enlightenment campaigns that will make the citizens to stop discriminating against women in the areas of education, career advancement and political appointments / elections. This study found out that gender inequality has negative effect on inclusive growth, thus the Nigerian government should give equal preference for women as much as the preference they give to men.

This study found out that in line with Akor (2012), there is a lack of gender balance in the economy, and this cuts across virtually all the sectors. This is observed in the sectors like education, politics, health, justice where women are not given equal opportunities given to men. It is disheartening to know that in Nigeria, 80.2 million women and girls have a significantly worse life chances than men and also their sisters in comparable societies; 60–79% of the rural workforce is women but men are five times more likely to own land. In eight Northern states in Nigeria, over 80% of women are unable to read compared with 54% for men. 70.8% of young women aged 20–29 in the North-West are unable to read and write and only 3% of females complete secondary school in the northern zones (Akor 2012).

This study examined the relationship between gender inequality, maternal mortality and inclusive growth in Nigeria using the Autoregressive Distributed Lag (ARDL) econometric approach. Based on the empirical findings of this study, it was revealed that maternal mortality, gender inequality and infant mortality have negative effects on inclusive which support theoretical *a priori* expectations that say that they should all have negative impact on inclusive growth. This study is an eye opener to the fact that there is a link between gender inequality, maternal mortality rate and inclusive growth in Nigeria. To this end, this study has contributed to knowledge in this aspect.

However, the methodological limitation of this study stems from the fact that the technique of estimation used did not actually measure the impact of gender inequality and maternal mortality on inclusive growth in Nigeria, thus recommendation for further studies

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Appendix 1

See Table 6.

Table 6 Ramsey RESET test for omitted variable bias. *Source:* Authors' computation, 2019

	Value	Df	Probability
<i>Omitted variables: squares of fitted values</i>			
t-statistic	0.329614	7	0.7513
F-statistic	0.108646	(1, 7)	0.7513
	Sum of Sq.	Df	Mean squares
<i>F-test summary</i>			
Test SSR	1.486241	1	1.486241
Restricted SSR	97.24426	8	12.15553
Unrestricted SSR	95.75802	7	13.67972

Appendix 2

See Table 7.

Table 7 Serial correction test. *Source:* Authors' computation, 2019

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob*	
. * .	. * .	1	0.125	0.125	0.3020	0.583
. ** .	. ** .	2	-0.272	-0.293	1.8292	0.401
. * .	. * .	3	-0.201	-0.134	2.7249	0.436
. * .	. * .	4	0.145	0.128	3.2330	0.520
. * .	. .	5	0.141	0.019	3.7543	0.585
. * .	. * .	6	-0.112	-0.109	4.1178	0.661
. .	. .	7	-0.061	0.061	4.2354	0.752
. * .	. * .	8	-0.077	-0.135	4.4490	0.815
. .	. .	9	0.041	0.010	4.5186	0.874
. * .	. * .	10	0.096	0.086	4.9648	0.894
. .	. .	11	0.013	-0.026	4.9748	0.932
. .	. .	12	-0.055	-0.006	5.1921	0.951

Appendix 3

See Table 8.

Table 8 Correlation matrix for multicollinearity. *Source:* Authors' computation, 2019

	Gross domestic product per capita growth rate	Infant mortality rate	Maternal mortality rate	Inequality	Female primary education	Female secondary education	Female labour force
Gross domestic product per capita growth rate	1.0000						
Infant mortality rate	0.2911	1.0000					
Maternal mortality rate	-0.2145	-0.4820	1.0000				
Inequality	0.4509	0.3348	-0.3694	1.0000			
Female primary education	0.5658	0.1938	-0.0971	0.7710	1.0000		
Female secondary education	0.3952	0.7089	-0.7046	0.6886	0.4105	1.0000	
Female labour force	0.5320	0.5053	-0.3482	0.670	0.6892	0.6769	1.0000

Appendix 4

See Table 9.

Table 9 Heteroskedasticity test: Breusch–Pagan–Godfrey. *Source:* Authors' computation, 2019

F-statistic	0.860593	Prob. F(7,8)	0.5720
Obs*R-squared	6.872889	Prob. Chi Square(7)	0.4422
Scaled explained SS	1.071925	Prob. Chi Square(7)	0.9936

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