

FEMALE LABOUR PARTICIPATION AND ECONOMIC GROWTH IN NIGERIA

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Abstract

The International Labour Organization (ILO) indicates that female labour force participation rate in Nigeria has been growing in recent years. Given this assertion, this study examined the effect of the growth in female labour force on economic growth in Nigeria between 1985-2016. Unit root and ARDL bound tests were used to determine whether the growth in female labour force and economic growth are stationary and co-integrated. The study also used the Dynamic Ordinary Least Square (DOLS) model and the Granger causality test to assess the impact of the growth in female labour on economic growth and determined the causal relationship between the variables respectively. The results of the study showed that growth in female labour has a negative and significant effect on economic growth in Nigeria and that there exists a unidirectional causality that runs from growth in female labour to economic growth. The findings suggest that policies geared towards improving the productivity of female labour in Nigeria should be encouraged so as to improve their contribution to growth.

Key words: Female Labour, Male Labour, Economic Growth, DOLS, Productivity, Nigeria.

JEL Classification: J21, O47

Introduction

In Nigeria, males have typically dominated most of the positions both in the formal and informal work places. However, in recent years, some notable changes have taken place in the Nigeria economy one of it is the increase in the number of female workforce in the nation's labour market across all professions. Available data indicated that the percentage of female workforce 15 years and above engaged in the labour market increased from about 35.8 per cent in 1981 to about 48.4 per cent in 2016 with many of them heading high positions in the workplace (WDI, 2016). This increase has generated considerable interest in the study of gender related issues among researchers. For instance, Fadayomi and Olurinola (2015) observed that changes in the structure of families and better family orientation in Nigeria have made it easier for women to aspire for higher education and better paid work. Nigerian women in recent times assumed greater responsibilities in the management of business organisations, as well as, in leadership positions than ever before. Despite the barriers militating against their full participation in the labour market, economic hardship in the country requires women to augment the earning of their husband and their parents.

Anyanwu (2014) observed that trade openness, education, industrialisation and paid employment, are significant factors responsible for the drift of women from traditional agricultural sector into the modern sector of the economy. Apart from the factors observed by Anyanwu, the changes in the perception of women's participation in labour market in Nigeria could also be attributed to the prevailing economic situation that puts much demand on family income (Fadayomi, 1991; Winker, 2016). The arguments that women engagement in work force provides economic sustainability both to the immediate family and society are often justified as some of the benefits associated with increase participation of women in a nation's workforce (Ferrant & Kolev, 2016; Cuberes & Teignier, 2016; Winker, 2016). Women now have better opportunities in regular paid employment, entrepreneurship and earn higher wages that would lift

themselves and their families out of poverty than the past. However, what remains unclear is whether the increase in women participation in the labour force contributes to the economic growth of Nigeria.

Therefore, this paper investigates the effect of female labour force on economic growth in Nigeria. Examining the effect of female participation on economic growth is of interest for two reasons. First, as at 2016, females of working age in Nigeria constitute about 51 percent of the working age population (WDI, 2016). As such, the contribution of this section of the population to labour market and economic growth of the nation is important for policy decision. Second, undoubtedly, economically empowered women play veritable role in the management, marketing and decision-making in all sectors in Nigeria, yet, evidence linking the role of women to economic growth in Nigeria still remains weak. Understanding the extent to which female labour force affects economic growth could justify the need to encourage more women to participate in the labour force especially in the mainstream sector of the economy.

Theoretical and Empirical Literatures

The main stream of the Neoclassical growth theory maintained that there is a positive relationship between economic growth, capital stock, labour and technological progress. The main proponents of economic growth include Solow (1962) and Romer (1991). The theory maintained that growth in GDP is a function of growth in labour, capital and technology. The theory holds that technology play an important role in increasing per capita output by augmenting either labour, capital or both. However, recent researches have emphasised on the importance of human capital in economic growth (see, Levin & Rant, 1997; Rizvi & Lingard, 2007). This thus suggest that increase human capital efficiency tends to lead to increase in the output of a country mainly because technological progress that is labour augmented increases output faster, especially in developing country.

The empirical literature examined in this study are divided into two: the first strand of literature examined female contributions to economic growth in other parts of the world; while the second strand of literature focused on the impact of female labour on economic growth in Nigeria.

There are few empirical studies carried out on the impact of female labour force on economic growth. The study by Jehan (2000) observed that in Pakistan women in rural areas contributed more to economic activities than their female counterparts in the cities. Given available data, 75 per cent of women in the rural areas owned farms of their own and were engaged in all farming activities ranging from grass clearing to harvesting and rearing of animals. Similarly, Scholz (2012) found that women in Asia in general contributed more than 50 percent to agricultural output.

Klasen and Lamanna (2009) studied the impact of gender inequality in education and employment on economic growth across 139 countries. Using panel data analysis, the study observed that apart from countries in Sub-Saharan Africa and Latin American, countries that have witnessed growth in female labour participation also were able to achieve positive and significant economic growth. The study found that gender gaps in education and employment reduces economic growth in most countries of Sub-Saharan Africa, Latin America and the Caribbean.

The study by Seguino (2000), Gaddis and Klasen (2014), Klassen and Pieters (2015) observed that differences in gender participation across sexes seen in terms of differences in income; participation rate in paid income and unpaid labour also determined economic growth. Their argument thus was that the economic growth of a country depends largely on the structure of its labour force and that country whose labour force structure has low inequality rate between the male and female labour force tends to have high growth rate and are more industrialised than those that do not. This is because when the gap between female and male income are bridged it tends to increase output in both genders. They also pointed out that increase in female labour leads to increase in family income and in improvement in family well-being.

On the contrary, using panel GMM regression, Verme (2015) found that the U-shape hypothesis does not apply to countries of Middle East and North Africa because the employment of female labour is low compare to the level of their economic development. Wasen and Lamanna (2009) using a panel Ordinary Least Square (OLS) regression analysis found that gender gap in the Middle East, North Africa and South Asian was so huge that it negatively affected economic growth of the countries in these regions.

Nezhad and Hojjat (2005) also observed that women's participation and employment rates in the labour market in Iran in proportion to those of men are low, despite the improvement in the rate of education and awareness in the country. One of the reasons established for this was low attention paid to the importance and necessity of women's participation in economic activities.

In Nigeria, the study by Oluwa and Adeoti (2014), using the Harmonized Living Standard Survey (HLSS) and a two-stage stratified sampling techniques, found that women's educational level is one of the main factors that determined their participation in the labour market in the rural areas of Nigeria. Other factors that affected the participation of women in labour market included their age, marital status and the size of their household.

The study by Onyejekwe (2001) found that the increase employment of women in key sectors of the Nigerian economy like in banking and the manufacturing sectors had helped to increase their worth in the society, which in turn, had led to effective service delivery and economic growth. The results further revealed that the successful implementation of the innovative micro-finance schemes had made it quite easy for women to become engage in Small and Medium Scale Enterprises (SMEs) thus increasing their contribution to economic development.

Fabiye *et al* (2007) examined the roles of women in agricultural development and their constraints in Biliri Local Government Area of Gombe State, Nigeria, and observed that women in the Local Government Area were involved in all forms of farm activities which included land cleaning, harvesting, processing and marketing of products. By implication, women farmers contributed immensely to food production, distribution and animal rearing in the Local Government Area. Onemolease (2002) and Igueben and Esan (2010) were also of the view that younger women were more willing to engage in agriculture and contributed to the sector than their male counterparts of the same age in Nigeria.

The United Nations Population Fund [UNFPA] (2012) was of the view that about 54 million women representing 49 per cent of the total population of Nigeria's population live in rural areas where they provide 60–79 per cent of the rural labour force. By implication, this means that female labour contributed tremendously to agricultural production in Nigeria.

The findings of the literature reviewed thus far shows different results of the effect of female contribution to economic growth, implying that there is more to learn on the effect of female force to economic growth. The literature reviewed on female contribution in the labour market in Nigeria concentrated on women's contribution to particular sector, most emphasized on the impact of women on agricultural sector with less attention given to their overall contribution to the economy as a whole. The contribution of this study to the body of literature is twofold: first, the study investigates the effect of female labour force to economic growth in Nigeria. So far, our understanding on the contribution of the female gender to economic growth is unclear especially in terms of magnitude and signs. Second, World Bank Indicators (2016) statistics shows continuous increase in women participation in the work force; this study investigates whether the increase in female participation in labour force is caused by growth in the nation's economy or vice versa.

Data Source and Model Specification

Data used for this study was an annual time series that covered the period between 1985 and 2016. The variables used for this study include growth rate in GDP (real GDP at constant 2011 national prices in millions of US dollar), female labour participation (female labour 15 years and above), male labour participation (male labour 15 years and above), capital stock (capital stock at constant 2011 national prices in millions of US dollar) and human capital index (base on years of schooling and returns to education). All the data are sourced from the World Bank Indicators for the year 2016, except for human capital index which was sourced from Polity 4.

Following the Solow neoclassical growth model with an aggregate production function is stated as:

$$Y = K^{\alpha} (AL)^{1-\alpha} \quad (1)$$

Where: Y is income; K is Capital; L is Labour; and A is the Productivity of Labour. Although the Solow growth model is in nonlinear form, transforming the model through logarithm process and adapting it makes it relevant for this study. In this study, the Solow growth model is re-specified as:

$$EG_t = A_t f(FL_t, ML_t, KS_t, HCI_t). \quad (2)$$

Where:

EG_t = Economic Growth: economic growth is proxied by the growth rate in real GDP measured at constant 2011 national prices in millions of US dollar.

FL_t = Growth in Female Labour Force participation in the Nigerian: growth in female labour force is proxied by national estimate of the growth rate in female labour force as percentage of total population age 15 and older that are economically active.

ML_t = Growth in Male Labour Force Participation in Nigeria: growth in male labour force is proxied by national estimate of the growth rate in male labour force as percentage of total population age 15 and older that are economically active.

KS_t = Growth in Capital Stock: growth in capital stock is the growth rate of capital stock at constant 2011 national prices in millions of US dollar.

HCI = Human Capital Index: human capital index measures the economic contribution of citizens relative to investment in humans base on years of schooling, health and returns to education. The index ranges from zero to one. Human capital index of one implies high contribution to economic activities relative to investment while zero is otherwise.

Econometrically, the model can be rewritten as follows:

$$EG_t = \alpha + \beta_1 FL_t + \beta_2 ML_t + \beta_3 KS_t + \beta_4 HCI_t + v_t \quad (3)$$

Where:

α , β_1 , β_2 , β_3 and β_4 are parameters to be estimated,

v_t is the stochastic error term which represents other variables such as trade openness and government policies that are not included in the model but influences economic growth.

This study used descriptive and the Dynamic Ordinary Least Squares (DOLS) regression analysis. The descriptive statistic was used to analyse the nature of the data, while the DOLS was used to assess the impact of female labour force on economic growth in Nigeria. The DOLS estimation method has an

advantage over the Ordinary Least Square (OLS) method especially when there is evidence of cointegration among the variables.

According to Stock and Watson (1993), DOLS is an improvement on the OLS as it provides a robust estimate even when the sample is small. The DOLS also correct for any endogeneity among regressors by the inclusion of leads and lags of the first differences of regressors, as well as correct for serial correlation through the General Least Square (GLS) procedure. The DOLS is most appropriate when the dependent variable is found to be I(1), while the independent variable is either I(1) or I(0). The model in equation (3) can thus be specified as:

$$EG_t = X_t M' + \sum_{i=-m}^{i=m} \phi_i \Delta FL_{t-i} + \sum_{i=-n}^{i=n} \theta_i \Delta ML_{t-i} + \sum_{i=-l}^{i=l} \gamma_i \Delta KS_{t-i} + \sum_{i=-k}^{i=k} \pi_i \Delta HCI_{t-i} + v_t \quad (4)$$

Where:

M= all parameters to be estimated ($\alpha, \beta_1, \beta_2, \beta_3, \beta_4$);

X = the variables used in the model (1, FL_t, ML_t, KS_t, HCI_t); and

m, n, l, k = the lengths of leads and lags of the regressors.

To ensure that the series are stationary, it is necessary to conduct a test for Unit root. The intuition for stationarity is that, if the series are stationary, then, it has a tendency to return to a constant mean. The presence of Unit root in a time series means that it is non-stationary. As such, may lead to a spurious regression (see, Granger & Newbold, 1974). Where there is no Unit root then the estimation process can continue. However, if the series have a Unit root, the difference operator can be applied until the series become stationary. There are different types of Unit root tests. For this study, the Augmented Dickey Fuller (1979) and Phillips-Perron (1988) test which are most popular and have proven to provide good results were used. Finally, to test the causal relationship between female labour participation and growth in GDP, the Pairwise Granger causality test was used.

Results and Discussions

The results of the of the relationship between female labour participation and growth in GDP in Nigeria are shown in Table 1.

Table 1: Results of the Relationship between Female Labour Participation and Growth in GDP in Nigeria

	RGDP	RK	FLF	MLF	HCI
Mean	503241.5	1014201.	16121419	24496392	1.503165
Median	360528.7	902408.0	15753954	23497277	1.473873
Maximum	993721.8	2032533.	25044028	34082437	1.910342
Minimum	217117.9	517072.6	9461267.	19764415	1.207948
Std. Dev.	265113.6	439519.7	5002120.	4251264.	0.235128
Skewness	0.654485	0.816488	0.210047	0.809436	0.235041
Kurtosis	1.948848	2.697769	1.715913	2.505677	1.660157
Jarque-Bera	3.757768	3.677276	2.433811	3.820132	2.688208
Probability	0.152760	0.159034	0.296145	0.148071	0.260773
Sum	16103729	32454426	5.16E+08	7.84E+08	48.10129
Sum Sq. Dev.	2.18E+12	5.99E+12	7.76E+14	5.60E+14	1.713841
Observations	32	32	32	32	32

Source: Authors' computation, (2017).

The result in Table 1 shows that the average real GDP within the period under consideration in Nigeria is \$503241.5, while the maximum and minimum amounts of GDP within the same period were \$993721.8 and \$217117.9 respectively. The large difference between the maximum and minimum values of real GDP implies that the value of GDP also increased. Some scholars attribute part of this increase to the increase in the contribution of the service sector (see, Adeniyi & Egwaikhide, 2015). The standard deviation which indicates the nature of dispersal in the value GDP relative to its mean is large. This implies that there has been an increase in the real GDP over the years in Nigeria which connotes an increase in the contribution of factors of production and growth in the economy. Over all the real GDP follows a normal distribution.

The average number of female and male labour employed for the period are 16.1 and 24.5 million respectively. In absolute terms male labour tends to be higher than the female labour in work places as shown by their maximum and minimum values. This may be as a result of discrimination and priority given to male labour over the years in Nigeria (Fadayomi & Olurinola, 2015).

The average value of the real capital stock (RK) and the human capital index (HCI) for the period was \$1014201 million and 1.503 units respectively. As indicated by the standard deviation, the value of real capital stock has increased over the years, but relative to the increase in the level of economic activities and number of workers, the capital stock remains insufficient. The human capital index is quite low due to low investment in education and skills. Investment in education in Nigeria as percentage of GDP remains below the United Nations Educational, Scientific and Cultural Organisation (UNESCO) recommended average of 26 percent of national GDP (Kabuga & Hussaini, 2015).

Using the trend analysis to ascertain the behaviour of all the variables considered for this study, in the long-run, it was observed that all the variables have trend and intercept. The Unit roots of the variables are presented in Table 2.

Table 2: Results of ADF and PP Unit Root Test of the Relationship between Female Labour Participation and Growth in GDP in Nigeria

Variable	Level		1 st Difference		Order of Integration
	ADF	PP	ADF	PP	
RGDP	-2.85 (0.189)	-2.91 (0.17)	-7.68*** (0.00)	-13.54*** (0.00)	I(1)
FLF	-3.95** (0.022)	-4.29*** (0.00)	-	-	I(0)
MLF	-2.38 (0.383)	2.43 (0.35)	-5.64*** (0.000)	-5.68*** (0.00)	I(1)
RK	-0.842 (1.000)	1.46 (1.00)	-9.71*** (0.000)	-4.53*** (0.00)	I(1)
HCI	-3.89** (0.025)	-5.4*** (0.00)	-	-	I(0)

Source: Authors' computation, (2017). Notes: P-values in parenthesis. ** and *** means the coefficient is significant at 5% and 1%.

Table 2, depicts the Augmented Dickey-Fuller (ADF) and Phillip-Peron Unit root tests of the five variables at level (1) and first difference for trend and intercept. As indicated, at level (1) the female labour force and human capital index are stationary at 5 percent level of significance, while real Gross Domestic Product, male labour force and real capital are non-stationary at level (1) but are stationary at first difference as the null hypothesis of Unit root process is rejected at 1 per cent significance level. The result thus implies that the variables are integrated of different order.

After establishing that the variables are integrated at $I(0)$ and $I(1)$, the ARDL bound test was used to ascertain if there is a long-run relationship between the variables. The result of the ARDL bound test is shown in Table 3:

Table 3: Results of ARDL Bound Test of the Relationship between Female Labour Participation and Growth in GDP in Nigeria

Test statistic	Value	K
F-Statistic	10.96	4
Critical Value Bounds		
Significance	I(0) Bound	I(1) Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.75	5.06

Source: Authors' computation, (2017).

The results of the ARDL bound test are shown in Table 3 indicated that, the F-statistic is greater than the upper critical bound value even at 1 per cent significant level. Hence, the null hypothesis of no co-integration is rejected. This thus implies that there is evidence of long-run relationship among the variables.

The long-run co-integrating regression using the Dynamic Ordinary Least Square (DOLS) estimates is shown in Table 4:

Table 4: Results of DOLS Estimates of Economic Growth in Nigeria

Variable	Coefficients	Diagnostic test	Values
GRFL	-5.42*** (-4.76)	R-Squared	0.81
GRML	-4.92*** (-6.72)	Jacque-Bera	3.25 [0.1963]
GRHC	11.23*** (5.75)	Wald-Test ($F_{4,30}$)	13.29** [0.0003]
GRKS	2.12*** (5.75)	Wald- χ^2 -Stat. (χ^2_4)	53.2 [0.0000]
C	0.04* (1.88)		

Notes: (.) t-values and [.] P-values. *, ** and *** means the coefficient is significant at 10%, 5% and 1%.

Source: Authors' computation, (2017).

The results of DOLS that linked in the growth of GDP, the growth of capital stock, the growth of female labour participation of persons with secondary education 15 years and above (FLB) and the growth rate of male labour participation of persons with secondary education 15 years and above (MLB) are presented in Table 4. The value of the constant represents the growth rate in technology.

As indicated in Table 4, the coefficient of growth in female labour force (GRFL) is negative and significant at 1 percent level of significance. By implication, it indicates that a one-point increase in growth of female labour impacted less to economic growth by 5.42 percentage point. The coefficient of growth in male labour (GRML) is also negative and significant at 1 percent significance level, meaning a one-point increase in the growth in male labour impacted less to economic growth by 4.92 percentage point.

The results of the coefficient of growth in female and male labour forces are contrary to the a-priori expectations of the effect of growth in labour on economic growth (Klasen & Lamanna, 2009). One possible explanation to this situation is that there are few productive resources relative to the number of

workers in Nigeria. As such, each additional worker does not increase GDP. The coefficients of the GRHC and GRKS are both positive and significant and both meet the expected signs. The results thus show that a one-point increase in the growth of human capital (GRHC) and the growth in capital stock (GRKS) impacted more to economic growth by 11.23 and 2.12 percentage points respectively.

Given that the results of the coefficients of the growth in female labour force (GRFL) and the growth in male labour force (GRML) contradict the theoretical expectations where the growth in labour force leads to growth in the nation's economy; two diagnostic tests were carried out to confirm the relevance of the coefficients in the model specified. These tests were the Wald and normality tests. The outcome of Wald test shows an F-value of 13.29 which is significant at 1 percent significant level, thus, confirming that all the coefficients are significant and relevant to the model. The normality test further confirms that error term is normally distributed. These results are thus consistent with the findings of Klasen and Lamanna (2009) who found that the gap in education and employment between men and women in the Middle East, North Africa and South Asian reduces economic growth across countries in the regions. The findings in this study also imply that employment is not based on productivity, given that labour productivity is very low.

It is also important to note that the result of the ARDL bound test shows that long-run co-integration exists between the variables which imply possibility of causality between or among the variables. Given this outcome therefore, the Granger causality test was conducted to ascertain the direction of causality among the variables. The result of the Pairwise Granger causality is shown in Table 5.

Table 5: Results of Pairwise Granger Causality Tests between Female Labour Participation and Economics Growth in Nigeria

Null Hypothesis:	Obs.	F-Statistic	Prob.	Granger Causality
FLF does not Granger Cause RGDP	32	5.74450	0.0089	Unidirectional causality
RGDP does not Granger Cause FLF		0.10647	0.8994	FLF → RGDP
MLF does not Granger Cause RGDP	32	0.16810	0.8462	Unidirectional causality
RGDP does not Granger Cause MLF		7.09901	0.0036	RGDP → MLF
HCI does not Granger Cause RGDP	32	4.96213	0.0153	Unidirectional causality
RGDP does not Granger Cause HCI		1.26221	0.3005	HCI → RGDP
HCI does not Granger Cause FLF	32	0.01097	0.9891	Unidirectional causality
FLF does not Granger Cause HCI		4.00827	0.0309	FLF → HCI
RK does not Granger Cause MLF	32	3.20606	0.0576	Bidirectional causality
MLF does not Granger Cause RK		3.98652	0.0314	RK ↔ MLF

Source: Authors' computation, (2017)

The results of the Pairwise granger causality test are shown in Table 5. As indicated, the growth in female labour Granger causes growth in real GDP and HCI at 1 and 5 per cent level of significant respectively. This implies that female labour is vital for economic growth in Nigeria. The Granger causality also shows that there is a bidirectional relationship between growth in male labour and real capital stock in Nigeria. This entails that increasing the rate of capital stock causes increase in the demand for male labour needed to put the capital resources into useful productive factor. Increase in the growth of male labour also necessitates increase in the demand for capital stock needed to produce goods and services. Again, the results revealed that growth in real GDP Granger causes growth in male labour supply, implying that increase in economic growth will cause employer to employ more male labour.

The result of the Granger causality is consistent with the findings of Fabiyen *et al* (2007) who established that female labour is important in the growth of GDP in Nigeria because although female work force are relegated to menial work they are more likely to engage in productive activity than their male counterparts. The result imply growth in GDP response to growth in female labour force, thus increasing

the skills and opportunities of the female work force which increases the possibilities of the female work force to contribute positively to economic growth.

Conclusion and Recommendations

This study examined the impact of growth in female labour participation on economic growth in Nigeria for the period 1985-2016. Using the Dynamic Ordinary Least Square and Pairwise Granger causality analysis, the results indicated that growth in both the female and male labour forces in Nigeria impact negatively and significantly to economic growth showing a major departure from main stream theory. By implications, it shows that female and male workers cannot individually influence economic growth in Nigeria.

Based on these findings, the study thus suggest policy measures such as improving access of the girl child to quality education and training women geared towards improving labour productivity. This can be achieve through compulsory education especially for the girl child and providing educational subsidies for the girl child at higher education so as to encourage women and girls to further their education instead of opting for the option of marriage. Agencies of government that are responsible for job creation can encourage the employment of female labour by giving special privileges to women that have shown exceptional qualities in every employment opportunities. This will serve as impetus to women to seek high career opportunities.

Employment should not be based on political patronage or nepotism but on employees' ability and capability. This will ensure that those who are capable and willing to work are employed into public or private offices. The government should also encourage productivity by promoting public- private partnership. Private sector can be made participate more in the economy when the ease of doing business is favourable for investors. Employment creation through the private sector will to ensure efficiency and reduce poor commitment to work that is prevalent in most public establishment.

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