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A COMPARATIVE ANALYSIS OF THE RELATIONSHIP BETWEEN FEMALE LABOUR FORCE PARTICIPATION AND ECONOMIC GROWTH: A CASE STUDY OF NIGERIA AND GHANA

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Abstract

The study compares the relationship between female labour force participation and economic growth in both Nigeria and Ghana from 1990 to 2012 using ordinary least square regression and Granger causality techniques. In Ghana, fertility rate was positively related to the female labour participation, thus a positive change in the fertility rate will induce positive growth and rise in the female labour supply; Primary school enrolment and secondary school enrolment show positive relationship with female labour participation, though not statistically significant. In Nigeria, fertility rate had positive relationship with the female labour force participation though not statistically significant. Also, the primary school enrolment was negatively related to the female labour force participation. The result of ganger causality shows that there is a unidirectional causality running from labour force participation to economic growth in both countries. Both countries did not confirm the existence of U-shaped hypothesis between female labour participation and economic growth.

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1. INTRODUCTION

West-African countries are small in area compared to the other parts of Africa, but makes up the largest population cluster in sub-Saharan Africa (Lewis et al, 2000). Most of the population live in the southern coastal area, along the Atlantic, as a result of European trading that led to economic development beginning in the 1200s. These countries have been tagged the poorest region in the world (Pfeffermann, 2001; World Bank, 2010). The argument on which this is premised cannot be over-emphasised, considering the uniqueness of the circumstances surrounding the economic growth and development of the continent. Really, the population growth is a key factor as a determinant of the national income (Aidi, Emecheta and Ngwudiobu, 2016 and Peterson, 2017), but this is different from the number and quality of the population who engage in the productive activities. In other words, the higher the proportion of the population who participate in the productive activities, the higher the level of per capita income vis-à-vis the level of the GDP (Duval, Eris and Furceri, 2010). But usually, the proportion of the population in the category is very low and even where it is adequate, the quality of the participating labour is far below average in some other part of the world. The distribution problem culminated into the unique characteristic of West-Africa where the majority of the citizen are poor and grow poorer in the face of abundant resources and huge population without adequate improvement in their living standard compared to what is obtainable in the other part of the world (World Bank, 2005a; United Nations, 2005). In other words, there has been a wide divergence between population growth, labour force participation and economic growth level in West-Africa and the rest of the world (Ravallion, 2001; Artadi and Salai-Matin, 2003; and Calderon &Severin, 2010).

It is a known fact that the female labour-force participation is much lower than that of the female population (World Bank Data base, 2013 and International Labour Organisation Statistics, 2013). This difference is to some extent rooted in culture and social norms, but it also reflects economic incentives. The female participation behaviour has attracted increasing interest due to equity and efficiency reasons. The labour force participation of women remains determined to a large extent by the level of female education, overall labour market conditions and cultural attitudes (Jaumotte, 2003). Furthermore, labour is a key variable in any production. By definition, an increase in the economy's GDP is expected to increase the production of goods and services. Production of goods and services is in-turned depends on labour force participation. Thus, a country's economic growth is considerably dependent on the labour supply and productivity of the labour force (Pattel, 2012). In addition, statistics from OECD shows the GDP

annual growth rates between countries from 1998 to 2002 differ greatly. Diversity in economic growth patterns is very common and questions have been raised on reasons for differences in economic growth in different countries in the world (Castellacci, 2004). For instance, GDP in Nigeria expanded 6.81 percent in the third quarter of 2013 over the same quarter of the previous year. From 2005, until 2013, Nigeria GDP growth rate averaged 6.8 percent reaching on all time high of 8.6 percent in December of 2010 and a record low of 4.5 percent in March of 2009 while GDP in Ghana expanded 3.90 percent in the second quarter of 2013 over the previous quarter. From 2006 until 2013, Ghana's GDP growth rate averaged 1.8 percent reaching on all time high of 7.8 percent in March of 2011 and a record low of 5.9 percent in June of 2010 (World development Indicator, 2014)

A country's most important macroeconomic objective remains how to achieve accelerated economic growth and subsequently, economic development. In order to achieve this laudable objective labour force participation stands out as one of the major catalyst. However, over the past several decades there had been drastic change in labour force participation rate especially for women (Farr, 2012; DiCecio *et al*, 2008; and Tansel, 2002). Available data showed that Ghana had an encouraging female labour force participation rate that was not less than 66 percent while similar figure for Nigeria was less than 40 percent within the years 1990 and 2010 (International labour organisation, 2012). Thus, it is important to know the impact of female labour force participation on Economic growth in both Nigeria and Ghana. This is to know if differences in female labour force participation cross the countries (Nigeria and Ghana) will really account for differences in economic growth in the countries. It will also avail us the opportunity to know the relationship that exist between female labour force participation and economic growth in both countries.

In addition, finding the relationship between female labour force participation and economic growth in both countries is important since no consensus has been reached by the existing literature on the kind of relationship exists between female labour force participation and economic growth. For instance, Costas *et al* (2012) and Patel (2012) found a positive relationship between female labour force participation and economic growth while Klasen and Lamanna (2009), and Baliamoune-Lutz & McGillivray (2009) found a negative relationship. Besides, Lahoti (2013); Nooreen *et al* (2013); Tansel (2002); Fatima and Sultana (2009); and Kottis (1990) argue that female labour force participation tends to decline with economic growth, plateaus at a certain stage of growth before rising again giving it a U-shape.

Finally, more comparative studies between Nigeria and Ghana can be done by find the direction of causality between female labour force participation and economic growth since no study has examine and compare the direction causality in both countries. In addition, studies conducted in Pakistan (Nooreen, Muhammed and Naeem, 2013), Jordan (Chamlou *et al* 2011), Ghana (Sackey, 2005), Australia (Emily, 2012), India (Aaronson *et al*, 2014, and Rahul & Swaminathan, 2013), Republic of Korea (Bauer and Young, 1987), Zimbabwe (Mupunga, 2013) show

inconclusive result on the direction of causality between female labour force participation and economic growth. Hence, this study will fill the aforementioned gaps by using two countries to enable us carry out a comparative analysis.

The rest of this study is arranged as follows: Section II contains the review of relevant literature. Section III explains the theoretical framework, methodology, model specification, data source and measurement. Section IV is about empirical analysis and discussion of result while Section V contains the conclusion and policy recommendation.

2. REVIEW OF LITERATURE

Achieving economic growth and development has been major concern of the economists since it is one the key macroeconomic goal. Labour force participation has been argued for and against to be having positive relationship with economic growth in both country and across studies. Emily (2012) found in Australia that growth in GDP per capita was driven by growth in labour utilisation and growth in labour productivity. Babatunde and Adefabi (2005) foundin Nigeria that a long run relationship between education and economic growth, and that a well-educated labour force appeared to significantly influence economic growth both as a factor in the production function and through total factor productivity. On the contrary, Ivan and Oleg (2008) for U.S. found that an elevated real economic growth resulted in decreasing labour force participation while Moren-Galbis (2012) found that economic growth reduces unemployment of skilled labour among OEDC. According to Olivier *et al* (2013), it is the women participation that positively impact economic growth among OECD countries.

Furthermore, findings from a number of empirical investigations in developing countries suggested that marginal effect of schooling on women's labour force participation was very low at the primary education level and rises sharply at post- secondary education level (Schultz, 1990b, 2002, and Lam and Duryea, 1999). The studies argued that at a higher level of education, market wage offers rose faster than reservation wages with additional years of schooling. A study conducted by Sackey (2005) for Ghana found female education to have significant positive relationship with female labour force participation in both urban and rural Ghana while fertility had a negative effect on female participation in the labour market. Ackah *et al* (2009) and Ntuli (2007) also found negative effect of fertility on female participation in Ghana and South Africa respectively. Shaheen *et al* (2011) found that larger family size was associated with higher participation of women in the Pakistan labour market, while Kofi *et al* (2003) found that the presence of children less than five years of age had no significant effect on labour market participation in Zimbabwe and Ghana. In addition, Fadayomi and Olurinola (2014) established that household size, status in the household, gender of head of household have significant impacts on labour force participation in Nigeria.

Moreover, Baah- Boateng *et al* (2013) argued that women with basic and tertiary education have a higher propensity of participation in Ghana. The study also suggests that having more children increases the likelihood of labour participation. Ugwu (2013) found that female labour force employment had a positive impact on the gross domestic product of the Nigerian economy while the male labour force employment showed a negative relationship with the gross domestic product of Nigerian economy. The a-priori expectation for male participation was in contrary to the empirical result in the study. Babalola *et al* (2013) found that women's education had a positive effect on labour force participation of married women while husband's employment and household size show a negative effect in Adamawa state in Nigeria. Contrary to Ugwu (2013) and Ivan and Oleg (2008); Lahoti (2013) found no significant positive relationship between economic development and women participation rate in labour force for India.

Tsani, Paroussou, Fragiadkis *et al* (2012) considered U-shape hypothesis and found that lower female labour force participation rates may lead to marginally lower economic growth in Southern Mediterranean countries, while the removal of region specific barriers to female labour force participation may encourage economic growth. In the vein, Cakir (2008) for Turkey found that economic development, unemployment, urbanization rate and total fertility rate have negative relationship on female labour force participation. On the other hand, it was found that education and agricultural share in the employment had positive effects on female labour force participation. Evidence from the time series shows proved the existence of considerable slowdown in the decline of female labour force participation rates. The study also shows an inverted U-shaped relationship. In addition, Nooreen, Muhammed and Noman (2013) for Pakistan follows U-shaped relationship and found that increase in education and dynamics of economic activity increased the women labour force participation in later stage of growth. Tsani *et al* (2013) confirmed the U-shape relationship between female labour participation and economic growth in South Mediterranean. Similarly, Tansel (2002) affirmed U-shape hypothesis and found that economic development has strong and positive effects on women labour supply but negative effects on unemployment.

Moreover, Fatima and Sultana (2009) confirm U-shaped relationship between women labour force participation and economic development in four provinces in Pakistan. Lincove (2008) reconsidered U-shaped female participation curve by focusing on the interaction between growth, female education and female labour. The study concluded that there was a negative relationship between economic growth and female labour force participation, that is, economic growth hindered female labour force participation. On the other hand, his longitudinal models suggested that this hindrance was not as big as previously thought; it also suggested that female schooling can increase female economic participation.

2.1. DETERMINANTS OF LABOUR PARTICIPATION

Ejaz (2007) found that age, educational attainment, marital status had significant positive effects on female labour force participation in Pakistan. Aminu (2010) had identified level of education, assets possession like own-home, living in free accommodation and residing in urban areas as factors determining labour participation in Nigeria. Umoru and Jameelah (2013) found education to be a significant determinant of labour productivity in Nigeria. According Salazar (2002) in Madrid, women's increasing participation in the labour market in all industrialized countries changed not only the composition of the labour force but also the processes at work within the households. In Nigeria, Aromolaran (2004) found that primary education was more productive in non-wage work relative to wage work while post-secondary education was more productive in wage work.

In addition, Klasen and Pieters (2012) established that participation of females with low education was essentially motivated by income and insurance considerations, while for highly educated women participation is mainly driven by opportunities reflected in market wages for India. Mupunga (2013) established that the major factors that determine female labour force participation are real wages offered in the non- agricultural sectors that are dominated by men, gross domestic product per capita, female education and male unemployment rate for Zimbabwe. Mon (2000) found in urban Zhejiang province (China) that age; education; presence of other adults in the household and marital status significantly determinants women's labour supply.

3. THEORETICAL FRAMEWORK

The U-shaped hypothesis is a fundamental proposition in this study. It makes a claim on the long term relationship between female labour force participation and economic growth. The theory posits that in the early stages and process of economic development, there is a rapid increase in the blue-collar jobs which raises the employment due to industrialization and urbanization which is reflected in the growth of the manufacturing sector. As a result of the opportunities in the blue collar jobs, male labour force participation increases so do their earnings and wages. On the other hand, female labour force participation declines because of the increase in family income.

As development takes place in the economy, introduction of technology and household appliances minimize the opportunity cost of time of female in the household and leads to increase in education which in turn leads to the increase in the demand for women in the white collar jobs. The higher demand for females' education increases female's earnings. Therefore, during rapid industrialization, female choses leisure to work which resultantly increases the female labour supply.

This transition of female labour force participation through the development cycle is what has been termed the U-Curve hypothesis. The left side of the U-Curve represents the period when the economy is significantly skewed

towards agriculture while the right side portion shows that industrial activities are dominant and the share of GDP is higher.

3.1. METHODOLOGY AND MODEL SPECIFICATION

The Ordinary Least Squares (OLS) econometric technique is employed for this study using time series. In line with the theoretical framework discussed above, the study adopted the U- shaped hypothesis using ordinary least squares (OLS) econometrics technique. This will be used to conceptualise the relationship between female labour force participation and its determinants. Specifically, the GDP and its square are used for the estimation of U- shaped relationship between female labour force participation and economic growth. This approach has been adopted by several authors including Nooreen and Naeem (2013), Tsani *et al* (2012) among others. Based on the general form of U- shaped curve, the relationship between female labour force participation and economic growth is modelled as follows:

$$FP_t = f(Y_t) \tag{1}$$

Where:

FP_t = Female Labour Force Participation
Y_t = Level of Economic Growth (GDP)

Other determinants of female labour force participation used in this study were school educational enrolment and fertility rate. The choice of education as one of the variables was prompted by the works of Umoru and Jameelah (2013), Nooren and Nooman (2013), Babalola et al (2013) among others. The choice of fertility rate was prompted by the work of Ackah *et al* (2009) and Cakir (2008) among others.

Also,

$$FP_t = f(ED_t + FR_t + Y_t) \tag{2}$$

Where:

- *ED* is the level of education (literacy rate) for women;
- FP is the total fertility rate;
- *Y* is the level of economic growth;
- and Subscript *t* represents the time period of scope of the study.

The level of education was used as school educational enrolment. *ED* was further disaggregated into Primary school enrolment and Secondary school enrolment of women. Therefore, the model was converted to;

$$FP_t = f(PE_t + SE_t + FR_t + Y_t + Y_t^2) \tag{3}$$

Where:

- *PE* is the primary school enrolment;
- *SE* is the secondary school enrolment;
- *FR* is the total fertility rate;
- *Y* is the gross domestic output;
- and $Y^2$is the square of the gross domestic output.

It was pointed by Ehrlich (1975,1996) and Cameron (1994) that adopting log- linear specification is a better option for empirical analysis. The log- linear specification provides reliable, efficient and unbiased results. So log- linear specification is as follows:

$$FT_t = \alpha_0 + \alpha_1 InY_t + \alpha_2 InY_t^2 + \alpha_3 PE_t + \alpha_4 SE_t + \alpha_5 FR_t + \varepsilon_t \qquad (4)$$

Where α_0 is the intercept, $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ and α_5 are the slope coefficients of the variables, ε_t is the error term while subscript *t* is time.

In order to estimate the short - run relationship among the variables of female labour force participation, this research work adopted the Error Correction Model. The ECM in the equation below is the error correction term in line with Nooreen, Muhammed and Naeem (2013).

A priori Expectations:

$$\alpha_1 > 0, \alpha_2 > 0, \alpha_3 > 0, \alpha_4 \; and \; \alpha_5$$

$$\Delta In\, FP_t = \alpha_0 + \sum_{i=0}^{n} \alpha_1 \Delta FP_{t-1} + \sum_{i=0}^{n} \alpha_2 \Delta Y_{t-1} + \sum_{i=0}^{n} \alpha_3 \Delta Y_{t-1}^2 + \sum_{i=0}^{n} \alpha_4 \Delta PE_{t-1} + \sum_{i=0}^{n} \alpha_5 \Delta SE_{t-1} + \sum_{i=0}^{n} \alpha_6 \Delta FR_{t-1} + \varphi ECM_{t-1} \qquad (5)$$

Where ECM_{t-1} is lagged error term and φ is estimate of lagged error term which captures the speed of adjustment from short run towards long run equilibrium path. Here, the differenced of female labour force participation was explained by difference of the independent variables plus lagged error term and stochastic term.

In line with the work of Engle and Granger (1987), this study adopted the ECM - type of granger causality tests. The bivariate causality test helped to address the causality issue between female labour force participation and economic growth. Given that the series are first difference stationary, the error correction equations used for testing causality between female labour force participation and economic growth are as follows:

$$\Delta FP_t = \alpha_0 + \sum_{i=0}^{n} \alpha_i \Delta FP_{t-1} + \sum_{i=0}^{n} \alpha_{2i} \Delta Y_{t-1} + \alpha_0 ECM1_{t-1} \quad (6)$$

$$\Delta Y_t = \alpha_1 + \sum_{i=1}^{n} \alpha_{4i} \Delta Y_{t-1} + \sum_{i=1}^{n} \alpha_{5i} \Delta FP_{t-1} + \alpha_1 ECM2_{t-1} \quad (7)$$

Where $ECM1_{t-1}$ and $ECM2_{t-2}$ are the lagged residuals of the long run co-integrated equations.

3.2. SOURCE OF DATA

The study depended primarily on secondary (annual) data sources. Notable variables used in this study include Real Gross Domestic Product (RGDP), female labour force participation rates, educational enrolment (primary and secondary), literacy rate and fertility rate. Central Bank of Nigeria Statistical Bulletin, Ghana Statistical Bulletin, World Development Indicators of the World Bank, National Bureau of Statistics, Federal Reserve Economic Data and International Labour Organisation Statistics were important sources of this study.

3.3. DATA SPECIFICATION AND MEASUREMENT OF VARIABLES

In order to carry out a comparative study of the Female Labour Force Participation and Economic Growth in Nigeria and Ghana, this study used an annual data over the period of 1990 to 2012, containing five variables namely: Gross Domestic Product per capita, literacy rate in form of educational enrolment (primary and secondary), fertility rate and female labour force participation rate for the two countries. These variables are measured as follows:

Economic growth: In this study economic growth was measured by real GDP. Economic growth is expected to have a positive impact on female labour force participation.

Literacy rate: Individuals in a country with the ability to read and write. This is measured using primary and secondary school enrolment of women between the ages 15 to 64.

Education: It is the total percentage of the population of official education age which is measured as the gross enrolment ratio in education of primary and secondary education by women. Education is expected to increase female labour force participation because it increases the potential earnings and therefore the opportunity cost of not working.

Labour Force Participation Rate: It is measured as:

$$\frac{Actual\ labour\ force}{Potential\ labour\ force} \times 100 \quad (8)$$

Where the potential labour force is taken to be the entire population minus young people less than 15 years of age, people who are psychologically ill, and

those above 65 years of age who may have retired. The actual labour force on the other hand refers to those people who are employed or willing to work but have no job and/ or are currently seeking for job.

Female Labour Force Participation Rate is measured as the proportion of a country's female working age population that engaged actively in the labour market either by working or looking for job. It provided an indication of the relative size of the female supply of labour available to engage in the production of goods and services.

Fertility rate is the average number of children that would be born to a woman over her lifetime or the average number of live births that a woman would have under the assumption that she survived to the end of her reproductive life (15 to 49 years of age). The coefficient of fertility rate is expected to be negative because after giving birth, mothers would spend most of their time on breastfeeding and childcare and therefore may choose not to participate in the labour market (Contreras *et al*, 2010).

The choice of these variables were being guided by previous studies of Kottis (1990); Mishra and Russell (2010); Psacharopoulos and Tzannatos (1989); Semyonov (1980); Sackey (2005); Babalola and Akor (2013); Tansel (2001); Tsani *et al* (2013); Nooreen and Naeem (2012); Aminu (2010); Anugwom (2009); and Mupunga (2013) among others.

4. EMPIRICAL ANALYSIS AND DISCUSSION OF RESULTS

Unit Root Test

In an attempt to test for the stationarity of the variables used in this study, the unit root test on all variables was carried out using the Augmented Dickey-Fuller (ADF) test and Phillip-Perron (PP) test with constant/intercept alone.

Table 4.1. *Result of Unit root test for Nigeria*

	ADF		**PPF**	
Variable	1stΔ	Status	1stΔ	Status
FPN	-4.6429* (0.0017)	$I(1)$	-2.5483** (0.0184)	$I(1)$
LNYN	-3.9293** (0.0301)	$I(1)$	-5.2299* (0.0021)	$I(1)$
PEN	-3.04446** (0.048)	$I(1)$	-3.0365* (0.0045)	$I(1)$
SEN	-4.3068** (0.0174)	$I(1)$	-5.8426* (0.0010)	$I(1)$
FRN	-3.6285** (0.015)	$I(1)$	-7.0647* (0.0000)	$I(1)$

Table 4.2. *Result of Unit Root Test for Ghana*

	ADF		PPF		
Variable	1stΔ	Status	Level	1stΔ	Status
FPN	-4.2283* (0.0041)	*I(1)*	_	-34123** (0.0216)	*I(1)*
LNYN	-7.1642* (0.0000)	*I(1)*	_	-10.1392* (0.0000)	*I(1)*
PEN	-4.1376* (0.0047)	*I(1)*	_	-4.1788** (0.0178)	*I(1)*
SEN	-5.8356* (0.0007)	*I(1)*	_	-5.9541* 0.0006	*I(1)*
FRN	-3.3203** (0.0302)	*I(1)*	-3.4124 (0.0216)	_	*I(0)*

Source: *Authors' computation*
NB: (*) and (**) imply the rejection of the null of non-stationarity (unit root) at 0.01 and 0.05 significance levels respectively. ADF-Fisher Chi-Square, PP-Fisher Chi-square: with the Null of Unit root (assume individual unit root process)

Cointegration Test Result

The study adopted the Engle and Granger residual based test and Engle Single equation method in order to ascertain the long run relationship of the variables which include the female labour force participation rate, fertility rate, primary school enrolment, real gross domestic product and secondary school enrolment in Nigeria and Ghana.

The test revealed that RGDP had long run relationship with other variables while female labour force participation as a dependent variable showed no long run relationship, that is not co-integrated with other variables, with tau-statistics of -2.5181 and z-statistics of -14.2873, the p- value of 0.8202 and 0.5296 showed the null hypothesis of no co-integration among the variables when female labour force participation as a dependent variable was statistically accepted. The Engle and Granger residual test (table 3) reaffirmed the result of the single equation by accepting the null hypothesis of no co-integration at 5% level of significance. This implied that Error Correction Estimation will not be applicable in Ghana owing to the lack of long run equilibrium. However, in order to achieve the objective by estimating relationship between the variables, the Ordinary Least Square was adopted by differencing the variables at different lags and also based it on the information criteria.

The Nigeria variables showed that the variables were co-integrated when Female Participation rate, Primary school enrolment, Real Gross Domestic Product and Fertility Rate were used as dependent variables (Table 4.2). The Engle and Granger Residual based test (table 4.3) reaffirmed the existence of long run relationship given the ADF statistics of residual which is greater than 5% critical value -3.0299, thus the residual is stationary at 5% level of significance.

Table 4.3. *Cointegration test for Ghana and Nigeria*

Variable	Ghana		Nigeria	
	t-stat (p – value)	z - stat (p – value)	t-stat (p – value)	z - stat (p – value)
FP	-2.5181 (0.8202)	-14.2873 (0.5296)	-3.6522 (0.3644)	-33.4813 (0.0000)
FR	-2.6849 (0.7605)	-7.1282 (0.9530)	-3.2423 (0.5308)	-24.1387 (0.0219)
PE	-3.9392 (0.2539)	-14.4926 (0.5271)	-5.1884 (0.0050)	-56.7916 (0.0000)
RGDP	-1.7946 (0.9674)	-3.16116 (0.0000)	-3.2720 (0.5181)	-23.3161 (0.0332)
SE	-3.3003 (0.5002)	-22.2752 (0.0772)	-4.1326 (0.2293)	8.3212 (1.0000)

Source: Author's Computation using E-views7

Table 4.4. *Engle and Granger residual based test for cointegration for Ghana and Nigeria*

Variable	ADF - Stat	Critical value	Remark
Residual for Ghana	2.3388	1% level -3.7880	Not Stationary at level
		5% level -3.0112	
		10% level -2.6461	
Residual for Nigeria	-3.5586	1% level -3.8315	Stationary at level (5% Critical level)
		5% level -3.0299	
		10% level -2.6551	

Source: Author's Computation using E-views 7

GHANAIAN MODEL

Table 4.5. *The estimation of the relationship between female labour participation and other variables in Ghana*

Dependent Variable: Female Labour participation in Ghana

Variables	Coefficient	t - stat	P - value
Δ (FR_G)	41.2680	2.8185**	0.0167
Δ(FR_G(-1))	-60.8783	-3.9934*	0.0021
Δ(PE_G)	0.0053	0.1017	0.9208
Δ(PE_G(-1))	-0.0178	-0.6901**	0.5044
Δ(LOG(RGDP_G))	-20.6820	-0.9690	0.3533
Δ(LOG(RGDP_G(-1)))	9.6425	3.6485 *	0.0038
Δ(LOG(RGDP_G))∧2	154.0103	1.3563	0.2022
Δ(SE_G)	0.0378	0.2984	0.7709
Δ(SE_G(-1))	0.1505	2.5152	0.0287
C	-1.8567	-2.3771	0.0367
R - Squared	0.8117		
Adjusted R - Squared	0.6687		

F - Statistics	5.486
Prob(F – Statistics)	0.0051
Durbin - Watson	1.8913

Source: Author's Computation using E-views7

The relationship between female labour force participation and variables of economic growth, secondary school enrolment, primary school enrolment and fertility rate were estimated using Ordinary Least Square. Having taken into consideration the non-stationary nature of the variables by differencing to obtain stability and coupled with the inability of the variables to achieve long run equilibrium. The diagnostics results of the model showed that there existed no serial correlation and heteroskedasticity. The Durbin-Watson of 1.891 (close to 2) indicated the likelihood of no auto-correlation, while F-statistics (5.486) with p-value of 0.00051, indicated that the coefficients of the model are jointly different from zero. In capturing the explanatory power of the model the R-square showed that about 81.78% of the model variation was captured by the explanatory variables. Although after correcting for the loss in the degree of freedom (the Adjusted R-square) the explanatory power reflected that about 66.87 percent of variation was accounted for the model.

The coefficient of the model showed that fertility rate was positively related to the female labour participation, thus a positive change in the fertility rate will induce positive growth and rise in the female labour supply, and this contradicts the submission of Sackey (2005) who submitted that there exists a negative relationship between female labour participation and fertility rate in Ghana. Primary school enrolment shows positive relationship with female labour participation, though statistically not significant at 5% level of significance. This is in support to the research work of Mehak (2007). This positive relationship may be attributed to the fact that many women in Ghana are self-employed and engage in informal sector economic activities while those in the formal sector are endowed with child care centres (Boasteng *et al*, 2013).

The theory of U- shape hypothesis says that if the coefficient of log of economic growth is negatively signed and statistically significant, while the squared of log of economic growth is positive and statistically significant, one can come to conclusion that there exists U-shape hypothesis. From the result, it showed thatthe coefficient of log of economic growth is negative, though statistically not significant, but the square of economic growth is positively signed and also not significant. This implies that the hypothesis of U-shape hypothesis did not hold in Ghana and this further confirmed the submission of previous scholars like Steel (1981) and Goldin (1994) who has asserted that U-shape hypothesis is mostly applicable in advanced economies.

The secondary school enrolment was positively related to the female labour force participation, the coefficient of 0.037 showed that a unit change in secondary school enrolment will lead to 0.037 increase in female labour force

participation. Its p-value of 0.7709 revealed the statistical insignifance of the variable.

NIGERIAN MODEL

Table 4.6. *The estimation of the relationship between female labour participation and other variables in Nigeria*

Dependent Variable: Female Labour participation in Nigeria

Variables	**Coefficient**	**t - stat**	**P - value**
Δ (FR_N)	0.8689	3.0607	0.0120
Δ(FR_N(-1))	0.116	0.0309	0.9760
Δ(PE_N)	-0.0052	-0.7122	O.4926
Δ(PE_N(-1))	-0.0086	-2.4355	0.0351
Δ(LOG(RGDP_N))	-5.7155	-1.2873	0.2270
Δ(LOG(RGDP_N))∧2	73.8041	1.7612	0.1087
Δ(SE_N(-2))	-0.0270	-1.4776	0.1703
ECT_N(-1)	-0.4549	-2.5470	0.0290
C	0.0908	0.6610	0.5235
R - Squared	0.8645		
Adjusted R - Squared	0.7561		
F - Statistics	7.9754		
Prob(F – Statistics)	0.0017		
Durbin - Watson	2.2727		

Source: Author's Computation using E-views7

In estimating the coefficient of the model, the research adopted the Error Correction Technique, owing to the long run convergence of the variables. The coefficient of the model showed that fertility rate had positive relationship with the female labour force participation though statistically not significant. Also, the primary school enrolment was negatively related to the dependent variable and its p-value showed that it was statistical not significant at five percent. Although its two-period lagged showed that it was statistically significant at 5% and this tends to decrease the female labour force participation by 0.0055. The coefficient of multiple determination (R^2) showed that 86.45 percent variation in female participation rate was accounted for by the explanatory variables in the model. The Durbin Watson of 2.272 showed that the model was free from serial correlation, the F- statistics of 7.975 with p-value of 0.0017 revealed that the model was statistically significant and good for prediction.

Similar to what was obtainable in Ghana, the Nigerian model also rejected the hypothesis of the U-shape hypothesis in Nigeria. This contradicts the opinion and submission of studies which have asserted that the female labour participation and economic growth follows a U-shape (Goldin, 1995; Mammen and Paxson, 2000; and Tansel, 2001 among others). The insignificance of the log of economic growth and squared of the log of economic growth implies that U-shape hypothesis

was not applicable in Nigeria. Thus, the study concluded that the hypothesis failed in both Nigeria and Ghana. The secondary school enrolment also showed that the variable was negatively related to the female labour force participation and its p-value showed that it was statistically not significant. This result negates the findings of Aromolaran (2004) who submitted that secondary school enrolment increases female labour participation in Nigeria.

The Error Correction term showed that 45.49 percent of the disequilibrium error will be corrected annually. The coefficient of determination (R^2) showed that 86.4 percent variation of female participation rate is accountable to the model's explanatory variables. The Durbin Watson (D-W) of 2.272 showed that the model is free from serial correlation and the F-statistics of 7.975 with p-value of 0.0017 revealed that the model was statistically significant and good for prediction.

Table 4.7. *Summary of Causality Test Result*

Null Hypothesis	**F-Statistics**	**Chi-Square**	**Direction of Causality**	**Remarks**
$YN \rightarrow FPN$	3.1577 (0.0914)	6.3153 (0.0425)	There is causality from $YN$to FPN	Unidirectional causality
$FPN \rightarrow YN$	0.0708 (0.9321)	0.1417 (0.9316)	There is no causality between form $FPN$and YN	
$YG \rightarrow FPG$	3.5664 0.0723	12.5298 0.0283	There is causality from YG to FPG	Unidirectional Causality
$FPG \rightarrow YG$	1.9585 (0.1967)	3.9170 (0.1411)	There is no causality between FPG and YG	

Source: Author's Computation E-views7

From the table above, the null hypothesis that female labour force participation does not cause economic growth can be accepted while the null hypothesis that economic growth does not cause female labour force participation can be rejected. The causality test between female labour force participation and economic growth for both Nigeria and Ghana showed a unidirectional causality. It was shown from the results that female labour force did not cause economic growth, but economic growth caused female labour force participation for both countries.

This implies that an economy with better economic growth in terms of good standard of living, high per capita income and increased productivity will translate to an increased female labour force participation rate.

5. CONCLUSION AND POLICY RECOMMENDATIONS

5.1. CONCLUSION

The findings of the study followed the conclusion of many scholars that the U-shape hypothesis is mostly applicable in advanced countries. This study has therefore showed that Nigeria and Ghana (developing countries) failed to subject to

the theory of U-shape hypothesis. The study also found that the economic growth caused female labour force participation in both countries.

Moreover, as regards the factors that affected female labour force participation, there was high fertility rate in both Nigeria and Ghana, low per capita income and low educational enrolment in both countries. These were attributed to the disparity that existed between female labour force participation and economic growth. In conclusion, promotion of educational standards among women, improved economy and regulating the fertility rate are effective ways of achieving increased female labour force participation in both countries.

5.2. POLICY RECOMMENDATIONS

This study recommends that: the governments in both countries should formulate and implement macro- economic policies that consistently raise economic performance so as to raise the level of female participation in the labour market; the government should encourage necessary child care centres for babies both at the public and private sectors to encourage mother participation in labour force; government should prioritise female education and economic development by promoting the Universal Basic Education.

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