Trade Openness and Female Labour Force Participation Rate in Nigeria

By

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Abstract

Gender differences and productivity issues are among the key challenges facing most developing nations. This has stimulated a lot of researchers' interest towards avenues to address these challenges. This study examined the relationship between trade openness and female labour force participation rate (FLFPR) in Nigeria. It adopted the autoregressive distributed lag (ARDL) bound estimation technique using data from World Development Indicators (WDI) and found that trade openness (TO), primary school education enrolment for female (PEEF), secondary school education enrolment for female (SEEF) and total fertility rate (TFR) have long-run positive impact on female labour force participation rate (FLFPR), while women with HIV has a negative impact on FLFPR. Trade openness, total fertility rate and women with unhealthy status have a short run negative impact on FLFPR, while female primary and secondary school education have short run positive impact on FLFPR. It was recommended that trade openness should be enhanced in Nigeria so as to enable women participate more in economic activities; government expenditure must be efficient enough to provide all social needs that will encourage schooling among Nigerian female and all citizens at large.

Key words: bounds test, gender, informal sector, labour force, unpaid labour

JEL: C32, F16, J21

1. Introduction

Above 50 percent of the global population is dominated by women who perform about 67 percent of available jobs, and earn 10 percent of the global income, with below one percent of asset in their name (International Labour Organization (ILO) 2013). This implies that women perform a vital function in nations' socio-economic structure but their impact seems unrecognised. In most developed countries, the contribution of women is seen more in the formal aspect of the economy but their contribution is tilted towards the informal sector of most developing nations (Nooreen, 2013).

The distribution between men and women across countries vary within manufacturing companies, formal and informal sectors of the economy, agricultural sector and other professions. Men have a greater chance of getting high-paid jobs and standard employments (full-time, permanent, top managerial skill) than women; since they have easier access to education, skills, loan and other fecund assets (United Nations, 2002). However, women are likely to sacrifice or reduce their participation in the labour force because of their responsibilities at home (National Bureau of Statistics (NBS) 2016).

Most aspects of economic activities and outcomes in Nigeria are gender biased; as a result, there is a considerable amount of macroeconomic losses with regard to economic expansion, growth, and income parity (International Monetary Fund (IMF) 2018). IMF (2018) further states that if Nigeria could bring the rate of gender inequality low to that of its peers, the country's real GDP per capita growth will rise by 1.25 percent annually. Gender inequality has also been a feature of the country contrary to the UNDP Report (1995) which states that "development is not engendered but endangered".

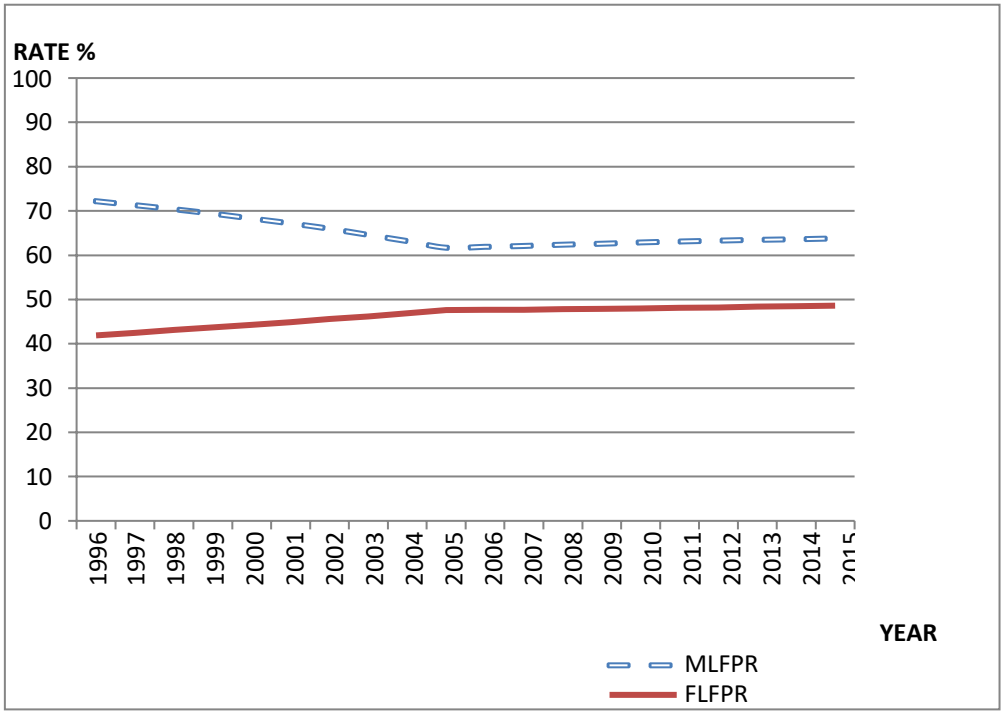
Some efforts have been made by Nigeria government to address these gender issues, especially by adopting the affirmative action to achieve gender equality in political and economic participation (Ethel, 2017). Also, one of the objectives of Millennium Development Goals (MDGs) states the achievement of full and constructive employment for everyone including women and youth to eradicate poverty (NBS, 2016), yet gender disparity still persist in Nigeria. According to the National Gender Policy Strategic Framework (2008) most policies and structures adopted to foster

women empowerment and gender equality have little or no effect in terms of quality representation in the labour market or political appointments for women.

Trade openness leads to structural change in an economy and this has different effect on men and women. The introduction of trade openness in Nigeria coincides with increased participation rate of female in labour force as shown in Figure 2, yet its impact on the participation of female in the labour market is not clear. Trade tends to make paid employment for women more available and accessible, especially in export sectors which gives them higher social and economic independence and more power over household resources. Most women employed in the export led industries also tend to earn much more than they would have earned in the traditional sector (Jane, 2005). Trade theory is of the view that the more a less developed country participates in international trade the more likely it may provide new job opportunities which favours low-skilled workers such as females in export led industries and this will in turn induce women with less skill to get involved with the economic activities (Simone and Tanankem, 2016).

NBS (2016) states that senior state civil servants are made up of 32.9 percent women and 67.1 percent men while the junior state civil servants are made up of 35.7 percent women and 64.3 percent men. The NBS (2016) further states that the distribution of Federal Staff by grade level 01-06, 07-10, 12-15 and 15-17 is 78.3, 75.3, 63.6 and 72.1 against 21.2 24.7, 36.4 and 27.9 respectively for men and women. This indicates that there is a wide gap in the gender spread of the work force. However, in as much as a large gap exists in gender distribution of labour force involvement in Nigeria's economic activities, the gap is seen to be slowly getting narrower year after year. This could be as result of the increase in women involvement in labour force comparative to their male counterparts as portrayed in the Figure 1.

FIG 1



Male and female Labour Force Participation Rate in Nigeria.

Source: Author's plot with data from World Development Indicators (World Bank, 2015)

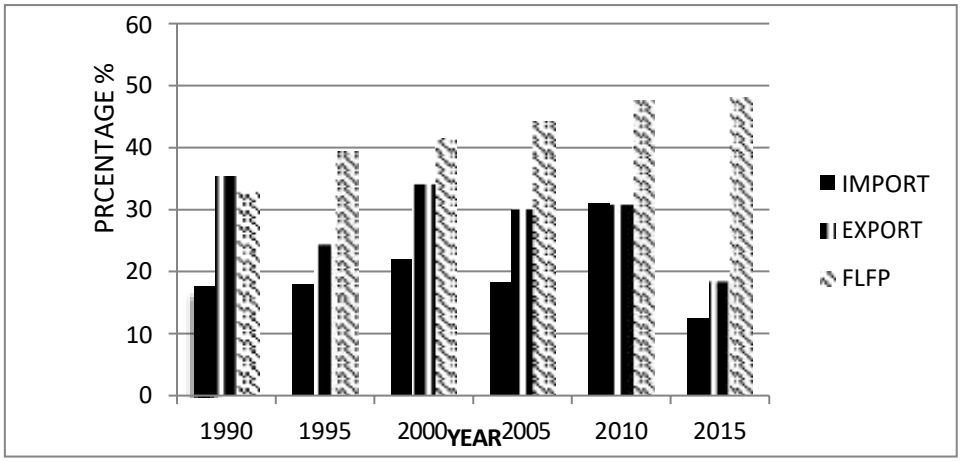
MLFPR – Male Labour Force Participation Rate

From fig 1, labour force participation rate for female was 41.9 in 1996 and in 2015 it became 48.6 indicating about 6.7percent increase after 19 years while that of men was 72.2 in 1996 and 63.8 in 2015 indicating about 8.4percent decrease. This analysis depicts that the gender disparity in work force participation have gradually decreased over the years. The relative rise in women participation in economic activities in Nigeria could arise from improved level of education, better government policies (such as affirmative action to actualise gender balance in political participation) favouring women, advancement and innovations fostering trade openness and decrease in household responsibility for women.

According to World Development Report (WDR) (2012), trade openness fosters globalisation and brings about changes in education, changes in education facilitates the participation of women in the labour market because the higher a woman's education, the more she tends to participate unlike her less educated counterpart in the labour market. Hence, since the level of education (for both men and women) has increased around the world, the involvement of women in paid job has also

risen. The inception of trade openness in Nigeria coincides with consistent increase in female labour force participation rate as shown in fig 1.2:

FIG 2



Import, Export and Female Labour Force Participation rate.

Source: Authors plot with data from World Development Indicators (World Bank, 2015)

From Fig 2, it can be deduced that the consistent rise in female labour force participation rate in Nigeria can be linked to trade openness since the period which the increase kicked off coincides with the period which trade openness was introduced in Nigeria. This notwithstanding, the report given by World Economic Forum (WEF) (2017) is that "Nigeria ranks 122 out of 144 in global gender gap", this indicates that Nigeria is still far from narrowing the gender gap.

There is no general agreement in literature on whether trade openness really increase women labour force participation rate since different authors found different results in their research work. Some found a positive link between trade liberalisation and female labour force participation rate while others found a negative relationship. Surprisingly, most of the research works on women labour force participation rate in Nigeria focused on the determinants of women participation in the labour market while that on trade openness (liberalisation) focused more on its impact on Nigerian economic growth and employment rate. To address this issue, this study examines the effect of trade openness on female labour force participation rate.

2. Review of Literature

The importance of trade to a nation was identified early in Europe in the 17th and 18th centuries by merchants, traders, bankers, philosophers and government officials who advocated mercantilism (Shodhganga, 2010). The term mercantilism was first noted by Adams Smith. The principle laid emphases on the significance of international trade and introduced the idea of balance of payment. Precious metals, such as gold and silver, were used as money/currency and quantity held by a country denotes the nation's wealth and power. The more precious metals a country possessed the wealthier and more influential it was. Since, all nations could not have excess of export against import simultaneously and the quantity of precious metal was limited, only one nation could enjoy the benefit of trade at the disadvantage of the others. Inflows of precious metals were enjoyed by countries characterized by excess export over import. As a result of this, policy advocacy by mercantilists was promotion and encouragement of exports and restriction of imports (Echekoba, Okonkwo & Adigwe, 2015).

Adam Smith being the major advocate of free trade and wealth increment of the trading nation also introduced the notion of absolute advantage. Smith (1937) proposed that all country ought to focus in the production of goods which it has absolute advantage in and import the goods it has absolute disadvantage in. His theory is made on the assumption of two nations, two goods and one production factor (labour) and that is why it is sometimes referred to as labour theory of value.

David Ricardo who is also a classical economist took smith's absolute trade theory to the next level in his "Principle of Comparative Advantage" which was introduced in the Principles of Political Economy and Taxation book published in 1817. The theory simply applies the principle of division of labour in different countries whereby a country can produce a couple of goods but cannot produce them all at the same cost (Ahuja, 2008). The comparative cost theory contends that a country can have absolute advantage in the invention and production of two different goods not in favour of another country and in such situation; it would benefit both countries to be specialties in the production and exportation of only one of the goods which it has comparative advantage or which its comparative cost is lower, where it then import the goods it has comparative disadvantage or which its comparative cost is higher.

The comparative advantage theory of the classical economists is based upon labour theory of value which demonstrates complete specialization in gains from trade. In the 20th century, this comparative trade theory was modified by Eli Hecksher (1919) and Bertil Ohlin (1933) by

considering the difference in factor supplies and endowment that is land, labour and capital on international trade. This factor endowment trade theory also analysed the effect trade has on the payment and return on these factors of production. According to Hecksher & Ohlin (1991), the production possibilities for all commodities are the same for all countries and hence, the ratio of the domestic product prices and the productivity of factor endowment will be the same for all countries. Therefore, the need for trade arises not because of the difference in productivity of labour in different countries for different goods but because of different factor endowment in different countries (Chang, 2005).

This theory explains what happens to factor allocation and income distribution when relative product prices change. Intra–industry trade refers to barter of goods and services between identical nations that export & import closely related but distinguished products. According to researchers such as Grubel and Lloyd (1975) and Krugman (1979) this validated the idea that economies of scale and imperfect competition results to trade regardless of the presence and absence of comparative advantage. Krugman (1979) reinforced the intra-industry model into an organised general equilibrium model by accommodating the general equilibrium of Dixit and Stiglitz's (1977) theory of monopolistic competition for the first time.

The human capital theory, according to Arrow (2003), postulates that individuals (both men and women) go to the labour market with different preferences, experiences, skills and education qualifications. The theory assumes that employers and employees are rational and would make the utmost decision. On the employee side, the theory assumes that the workers seek for the most paid jobs considering their preferences, skills and qualifications. Employers, on the other hand, seek to maximize profit by maximizing output (productivity) and minimising cost.

Radical feminists are of the view that subordination of women does not emerge from production but is linked specifically to reproduction and sexuality (Echols & Willis, 1990). They argued that home events are perceived as replicating and not producing labour power. According to Firestone (1972), sex-education launched directly from biological experience: men and women were created different and unequal. Her view and emphasis on procreation and sexual category was criticized because of its projection on the notion that the role of women in child birth is mainly for their subordination. Some empirical works have been done to check if trade liberalization leads to a

decrease/increase in women employment and the results vary from one researcher to another and from one country to another as seen in the following works.

Wamboye and Seguino (2014) analysed the impact of economic and trade structure on women's relative access to work in thirty-eight countries in Sub-Saharan Africa (SSA). They adopted three methods of estimation in this analysis [fixed effects (FE), random effects (RE) and two-stage least squares (TSLS)] on panel data for the period 1991–2010 and the findings was mixed. Trade expansion affects women's absolute and relative employment in mineral Exporting Countries (MECs) negatively and affects non-oil mineral exporting countries (NMECs) positively when holding other factors constant. If trade variables are disaggregated into exports and imports, its gender effect differs across sectors. For instance, import and export affects women's relative employment rates negatively in NMECs and MECs.

Tejani and Milberg (2010) used the female intensity of employment model that is made up of three main variables: growth in export, growth in the capital intensity of production and gender wage gap and a sample of 60 economies comprising of highly developed and developing countries to study the effects of trade liberalization on the female share of employment in manufacturing for the period 1985 to 2007 and the result revealed that employment of women relatively rose in developing countries but fell in developed countries. Their findings however showed that while there is an increase in women strength of employment in Latin American countries, most Southeast Asian and Pacific nations witnessed a decline in female employment and both regions are involved in import liberalization policy. Aguayo & Tellez (2011) suggested that the difference in the findings of Tejani and Milberg (2010) with regards to the two different regions could be because Southeast Asia and Latin America opened up to trade at different periods of time and were at different stages of industrialization.

Siddique (2009) used computable general equilibrium model to study the gender dimensions of the impact of trade liberalization in Pakistan and found that female's employment in unskilled jobs in Pakistan has risen as a result of trade liberalization. Their real wages also increased more than that of the males in all aspects of labour. To support this claim, Chinhui et al. (2012) used Mexico established level data to examine the relationship that exist between tariff reductions involved with the North American Free Trade Agreement (NAFTA), exports, and demand for women employees by building a model with existing and new machines that involve various amounts of white and

blue-collar tasks and found that reductions of tariff allows new firm into the export sector thereby leading to increased exports. Silvio and Li (2012), further buttressed these findings by employing country and industry-level data to study International Trade, Female Labour, and Entrepreneurship in Middle Eastern and North African (MENA) countries and found that using industry-level data, trade excessively affects female owned firms with higher female employee positively and also formed an informal prove that a link exists between a country's specialization and its measures of female labour participation which is consistent with theories of brain-based technological bias.

Atif et al. (2015) backed up these findings by employing OLS and ARDL approach to analyse the impact of Foreign Direct Investment (FDI) and Trade Openness (TO) on gender-based Labour Force Participation Rate Difference (LFPRD) and Wage Ratio (WR) in Pakistan. The result suggests that trade openness results to a fall in gender-based Labour Force Participation Rate difference and suggests that FDI in non-services sector should be promoted since it is observed to boosts female participation labour force rate (FLFPR).

Abdullah and Bakar (2011) employed Engle-Granger and Johansen test to analyse the causal and co-integration relationship between Total Fertility (TF) and women Labour Force Participation Rate (WLFPR), their findings indicated that a long run relationship exists between TF and WLFPR in all selected Asian countries. Njimanted and Mukete (2016) adopted two models with Generalized Method of Moment estimation technique and observed that female labour force in Cameroon are determined by fertility rate, male labour force, per capita and dependency ratio and economic growth variable is seen to affect female labour supply negatively and male labour supply positively.

David and Matthew (2013) made use of co-integration and error correction estimation approach to investigate the relation between trade liberalization and industrial growth in Nigeria and it revealed a positive and statistically significant correlation between trade liberalization and industrial growth in Nigeria. The result further revealed that structural changes had positive impact on Nigerian industrial growth.

Oyeyemi and Temitayo (2014**)** used Ordinary least Squares to examine if any relationship exist between female labour force participation and fertility in Nigeria and obtained a positive insignificant result. They also employed data obtained from Nigeria Demographic and Health

Survey and found a negative relationship between female labour force participation and fertility. The result further revealed that literacy rate and contraceptive incidence positively influence fertility while GDP per capita negatively influence fertility

Babalola and Akor (2013) made use of probit model to examine the factors affecting labour force participation of married women within the working age (18-60) in Adamawa state and found that education affects women participation in labour force positively while husband's with employment and family size affects female labour force participation negatively.) analysis is in line with the findings of Babalola and Akor (2013). They based their study on 2009/2010 Nigerian Living Standard Survey (NSLSS) collected by National Bureau of Statistics (NBS) to analyse the effect of education status of women on their labour market participation in rural Nigeria using control function and found that education level have a positive significant impact on women labour market participation (WLFP). WLFP is seen to be increasing at the initial stage with age and later it began to fall.

Matthew and Azuh (2013) employed the fixed-effect model with secondary and primary data to assess the role of trade liberalization on the formal- informal sector in Ado Odo/Ota Local Government Area of Ogun state of Nigeria. The primary data was obtained by administering questionnaires to discuss the possible avenues whereby trade liberalization could affect the reduction in wage variance between registered and non-registered workers between the periods 1981 to 2008. The findings revealed that in the manufacturing sector, related trade variables such as import penetration ratio affect the reduction in wage disparity between registered and non-registered workers positively.

Umoru (2013), examined employment and international trade flows in Nigeria using unit root test, co- integration and vector error correction (VEC) model and the result shows that the long-run effect of foreign direct investment on employment is positive and that of trade volume and trade liberalization is negative. To buttress the findings, Akinlo et al. (2013) carried out a research on the effect of trade liberalization on some selected poverty indicators in Nigeria (1980-2009) using Generalised method of Moments (GMM) and found out that trade liberalisation does have an insignificant effect on the enhancement of both female and male labour force participation rate in Nigeria.

3. Research Methodology

Theoretical Framework

The theoretical footing of this analysis stems from Gary Becker's theory of discrimination and human capital theory so as to cover contemporary dynamics that have emerged in recent times. Gary Becker's discrimination theory suggests that in a closed economy or non-competitive market, gives room for firms to purchase discrimination from extra profits they make (i.e. pay men more than women). Discrimination in labour force imposes an extra cost on the firm because it is usually caused by employer's biasedness based on non-productivity issues (Artecona & Cunningham (2002). Contrarily, firms' involvement in international competitive markets have zero excess profits and hence cannot afford to buy discrimination; if they do, and they will be forced out of business since their profit will become negative (Becker 1971). Since trade openness increases competition by allowing foreign producers to enter the market, it should bring about a decline in surplus profits and exclude those resources that create discrimination between the employment of male and female, thus reducing costs and increasing their productivity.

The Model

The autoregressive distributed lag model (ARDL) used by Atif et al. (2015) which was proposed by Persaran et al. (2001) to model the impact of globalisation on gender-based Labour Force Participation Rate Difference (LFPRD) in Pakistan served as a spring board for this work.

Model specification for this study is as follows:

$$FLFPR_t = \alpha_0 + \alpha_1 TO_t + \alpha_2 PEEF_t + \alpha_3 SEEF_t + \alpha_4 TFR_t + \alpha_5 HVF_t + \mu_t \quad (1)$$

where:

FLFPR - Female labour force participation rate (% of total population ages 15+ modelled ILO estimate)

TO - Trade Openness i.e. a proxy for trade liberalisation ($\frac{\text{import+ export}}{\text{GDP}}$)

TFR - Total Fertility Rate (births per woman)

PEEF - Primary Education Enrolment for female (Percentage of students in primary education who are female)

SEEF - Secondary Education Enrolment for female (Percentage of students in secondary education who are female).

HIVF - Human Immunodeficiency Virus for female (percentage of women with HIV)

ARDL model which uses bound test was used to measure the extent to which trade openness affects female labour force participation rate and to test for a long-run and short-run relationship among relevant variables. The calculated F-test statistics is compared with tabulated F-values provided by Pesaran et al. (2001). The ARDL models are known for having lags of the dependent variable, as well as lags (and possibly the current value) of the explanatory variables. Rewriting equation (1) in an Autoregressive Distributed Lag (ARDL) model form:

$$\Delta FLFPR_t = \lambda_0 + \sum_{i=1}^{n} \lambda_{1t}\Delta FLFPR_{t-i} \sum_{i=0}^{n} \lambda_{2t}\Delta TO_{t-i} + \sum_{i=0}^{n} \lambda_{3t}\Delta PEEF_{t-i} + \sum_{i=0}^{n} \lambda_{4t}\Delta SEEF_{t-i} + \sum_{i=0}^{n} \lambda_{5t}\Delta TFR_{t-i} + \sum_{i=0}^{n} \lambda_{6t}\Delta HIVF_{t-i} + \lambda_7 FLFPR_{t-1}$$

$$+ \lambda_8 TO_{t-1} + \lambda_9 PEEF_{t-1} + \lambda_{10} SEEF_{t-1} + \lambda_{11} TFR_{t-1} + \lambda_{12} HIVF_{t-1} + \varepsilon_t \ldots \ldots (2)$$

From equation 2, the summation signs together with the terms determine the short-run relationship while the others correspond to the relationships of the long-run among the variables. λ_{1t}, λ_{2t}, λ_{3t}, λ_{4t} , λ_{5t} and λ_{6t} are the short-run parameters and λ_7, λ_8, λ_9, λ_{10}, $\lambda_{11}$and λ_{12} are the long-run parameters. Δ and n is the first difference operator and the lag lengths of the model, respectively, while λ_0 and ε_t is the constant and error term respectively.

The first step is to conduct the Wald F statistics test (the bound test) so as to obtain the co-integration among the variables. If a long run relationship (co-integration) exists, then an estimate of a long run model (levels model) and the short run model (conventional Error-Correction Model) will be done. Pesaran et al. (2001) provided the tabulated F- values used for comparison with the F–test statistics. The F-values are the upper bounds and lower bounds which depend on the numbers of variables.

Unit root is employed to examine time series stationarity by looking at the pattern and trends in the data to examine if the variables exhibit constant mean, variance and covariance over the time series. The test reveals the order of integration of the unit series being examined. The Phillips-Perron test was adopted. Once the absolute Phillips-Perron test statistic is greater than MacKinnon critical value at 5% level of significance, the variable is stationary.

The second pre-estimation test carried out is the appropriate selection of number of lags for the ARDL model. There are different ways and methods of selecting a lag length. For this work, the

criterion for lag length selection was the Akaike Information Criterion (AIC) which selected 4 lags automatic.

Jarque-Bera (JB) normality test will be conducted. The test is carried out to check whether the error terms follow a normal distribution.

Hypothesis Testing:

H_0: JB=0 (the error term follows a normal distribution)

Decision Rule:

Reject H_0 if the probability value is less than 0.05 or,

Reject H_0 if $JB_{cal} > JB_{tab}$with 2 degrees of freedom.

The annual time series data for the period 1980 to 2016 were employed for this study. Data were sourced from the World Bank Development Indicator, which was published by the World Bank Group. The estimation was carried out using E-views version 9.0 Econometric Software.

4. Results and Discussion

The results of the Phillips-Perron test at level and first difference form are projected in Table 1:

Table 1: Test Result of Unit Root

Variable I(0)	Phillips/Perron (ʈ cal)	5%Critical value I(0)	Remarks (ʈ tab)I(1)	Phillips/Perron (ʈ cal)	5%Critical Value I(1)(ʈ tab)	Remarks
FLFPR	-1.777647	-3.544284	Not stationary	-4.771732	-3.548490	Stationary
TO	-2.719182	-3.544284	Not stationary	-8.514434	-3.548490	Stationary
TFR	-1.709387	-3.544284	Not stationary	-4.752711	-3.548490	Stationary
PEEF	-2.208728	-3.544284	Not stationary	-5.965115	-3.548490	Stationary
SEEF	-2.691202	-3.544284	Not stationary	-5.630134	-3.548490	Stationary
HIVF	-3.674945	-3.544284	Stationary			

Source: Authors' estimation using E-views 9.0

From Table 1, we can see that the critical values for the level form stationarity show that all variables were non-stationary at level form except Human Immunodeficiency Virus for female (HIVF). However, when the other variables were differenced, they all became stationary at order

one (I(1)). The unit root test sets the environment ready for ARDL bounds test and actual estimation.

Results of ARDL Bounds test

As the unit root tests certified the condition for the application of ARDL model, the long-run equilibrium relationship was examined by carrying out the bounds tests. The results of the ARDL bound test can be seen in Table 2:

Table 2: Results of ARDL Bounds Test

F-Statistics	I(0) Bound (lower bound 5% level	I(1) Bound (upper bound) 5% level
5.144428	2.62	3.79

Source: Authors' estimation using E-views 9.0

The results in Table 2 show that co-integration (long-run relationship) exist between the independent variables since 5% upper bounds critical value (3.79) is less than the calculated (F-statistic) value (5.144428) of the female labour force participation rate (FLFPR). A Similar result was found by Atif, et al (2015). This implies that the ARDL model can be established to determine the long-run and short run slope coefficient

Results of the ARDL Model

The choice of selection of the lag lengths was guided by the Akaike information criterion (AIC), and the lag lengths selected through this criterion are 3, 2, 2, 2, 2 and 0 for FLFPR, TO, TFR, PEEF, SEEF and TFR, respectively. From the ARDL result portrayed in table 3, the study found that first previous year of FLFPR does not have statistical significant effect on FLFPR, while the second previous year of FLFPR had a positive significant long run effect on current FLFPR. This indicates that in the long run, a unit increase in FLFPR at the second previous year brings about on the average 1.7% increase in current FLFPR in Nigeria. The third previous year of FLFPR had a negative significant long run effect on current FLFPR. This implies that in the long run, a unit increase in FLFPR at third previous year brings about on the average 2.8% decrease in current FLFPR in Nigeria.

This study further observed that the current year of trade openness (TO) had a positive and significant long run effect on FLFPR, implying that a unit rise in trade openness in the current year brings about on the average 1.1% rise in female labour participation rate in Nigeria. However, the first and second lags of trade openness had negative and positive insignificant effects respectively on labour participation rate of women. This finding is line with the findings of Wamboye and Seguino (2014) and Sivakumar and Sharma (2019). These results can be seen in Table 3:

Table 3: Long-run analysis of ARDL estimates

Variables	coefficient	Std. Error	t-value	Prob[y]
FLFPR(-1)	-0.034157	0.191471	-0.178391	0.8671
FLFPR(-2)	1.698842	0.726439	2.338589	0.0795
FLFPR(-3)	-2.72781	1.114230	-2.448157	0.0706
TO	1.091395	0.648848	3.178279	0.1679
TO(-1)	-1.806585	0.568416	-1.682050	0.0336
TO(-2)	1.373384	0.731616	1.877192	0.1337
PEEF	0.084363	0.014490	5.822029	0.0043
PEEF(-1)	0.008576	0.015366	0.558073	0.6066
PEEF(-2)	0.002035	0.018139	0.112175	0.9161
SEEF	0.088516	0.034558	2.561394	0.0625
SEEF(-1)	-0.004550	0.020099	-0.226385	0.8320
SEEF(-2)	-0.013569	0.031048	-0.437048	0.6846
TFR	0.062063	1.60216	3.183207	0.0307
TFR(-1)	86.80876	65.72048	1.320878	0.2570
TFR(-2)	273.5624	85.93925	0.217203	0.0334

HIVF	-0.034157	1.157786	-4.274024	0.0129

Source: Authors' estimation using E-views 9.0

Furthermore, the study found that the current year of primary school enrolment of female (PEEF) had a positive significant long run effect on female participation in labour force. This implies that an additional year to female primary school education brings about on the average 0.1% increase in the proportion of women in the labour force in Nigeria. However, the first and second previous year of PEEF had positive and insignificant long run effect on FLFPR. The works of Baah-Boateng, Nketiah-Amponsah and Frempong (2013); Adebiyi and Onifade (2014); and Forgha and Mbella (2016) observe a similar outcome.

It was also observed that secondary school education enrolment (SEEF) for females had a positive significant effect on female participation rates in labour activities, thus show-casing that secondary education is an important factor for female participation in labour market activities. This result is similar to the findings of Adebiyi and Onifade (2014); and Forgha and Mbella (2016). The first and second lags of this variable had no significant impact on female labour engagement in the labour market activities.

Just like the work of Abdullah and Abu (2011); Baah-Boateng, Nketiah-Amponsah, and Frempong (2013); Atif et al (2015); and Forgha and Mbella (2016), fertility rate also had a strong influence on the ability of women to participate in labour market activities. This study found that total fertility rate (TFR) had a positive and significant influence on the engagement of women in labour market activities. This does not conform to a priori expectation, which ordinarily would reduce female participation in labour markets. For the first and second lags, total fertility rate has respectively positive and negative but insignificant effects on female participation in labour market activities.

Finally, the study found that Human Immunodeficiency Virus in Female (HIVF) had a negative significant effect on participation of women in labour market activities in the long run, implying that the more the number of women with HIV, the lower the rate of participation of women in labour market. This signifies that women health is a significant factor determining the level which they participate in the labour force. The observation is similar with the findings of Nanfosso and

Christian (2010); Baah-Boateng, Nketiah-Amponsah, and Frempong (2013); and Sivakumar and Sharma (2019).

Short-Run Results

The results of the short-run analysis shows that primary school enrolment, secondary school enrolment, trade openness, total fertility (negative and correctly signed) are all significantly influencing female participation in labour market activities. However, the error correction term (ECT(-1)) has negative sign and is also statistically significant, which confirms the existence of a long run relationship among the variables in the model. It shows that about 97% of the deviations from long run equilibrium are taken care of in the next period. The results of the short-run are shown in Table 4.

Table 4: Short-Run Analysis of ARDL estimates

Variable	Coefficient	Std.Error	t-value	Prob[y]
D(FLFP(-1))	0.631381	0.021540	29.31247	0.0000
D(FLFP(-2))	0.105699	0.023367	4.523370	0.0000
D(TO)	-0.741815	0.059293	-12.51094	0.0000
D(TFR)	-3.105270	1.877551	-2.30607	0.0000
D(PEEF)	0.032942	0.002023	16.28508	0.0000
D(PEEF(-1))	0.001163	0.001885	0.617297	0.5382
D(PEEF(-2))	0.002123	0.001868	1.136103	0.2582
D(PEEF(-3))	0.003381	0.001931	1.751311	0.0825
D(SEEF)	0.044699	0.002760	16.19257	0.0000
D(SEEF(-1))	0.000684	0.002416	0.282973	0.7777
D(SEEF(-2))	0.001554	0.002376	0.653946	0.5144
D(SEEF(-3))	0.003132	0.002212	1.415572	0.1595

D(HIVF-1)	-0.001375	0.001390	-0.989050	0.3247
ECT(-1)	-0.970737	0.203743	-5.218099	0.0452
C	-0.002768	0.007037	-0.109141	0.9133

Source: Authors' estimation using E-views 9.0

Diagnostic Tests

Heteroskedasticity Test

Breusch-Godrey hetroskedasticity test was adopted to ascertain whether the error term has constant variance or not. Summary of the result is presented in Table 5:

Table 5: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.859370	Prob. F(27,4)	0.1581
Obs*R-squared	30.42370	Prob. Chi-Square(27)	0.2955
Scaled explained SS	0.498835	Prob. Chi-Square(27)	1.0000

Source: Authors' computation using Eviews 9.0.

From table 5, p-value (0.1581) is greater than 0.05. Therefore, we do not reject the null hypothesis. We therefore conclude that there is no heteroskedasticity in the model.

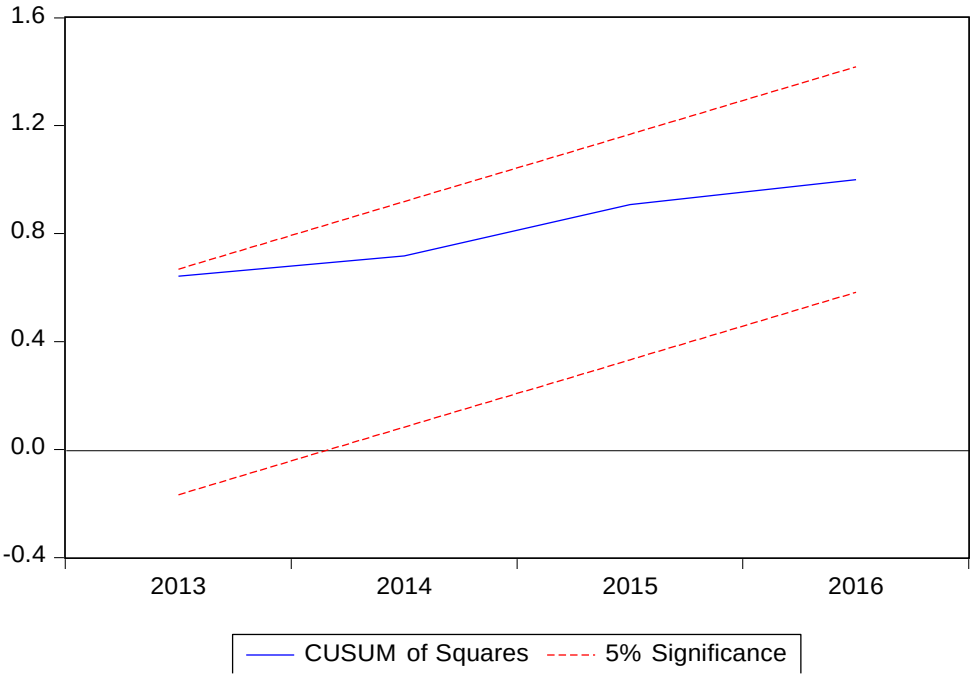
Normality Test

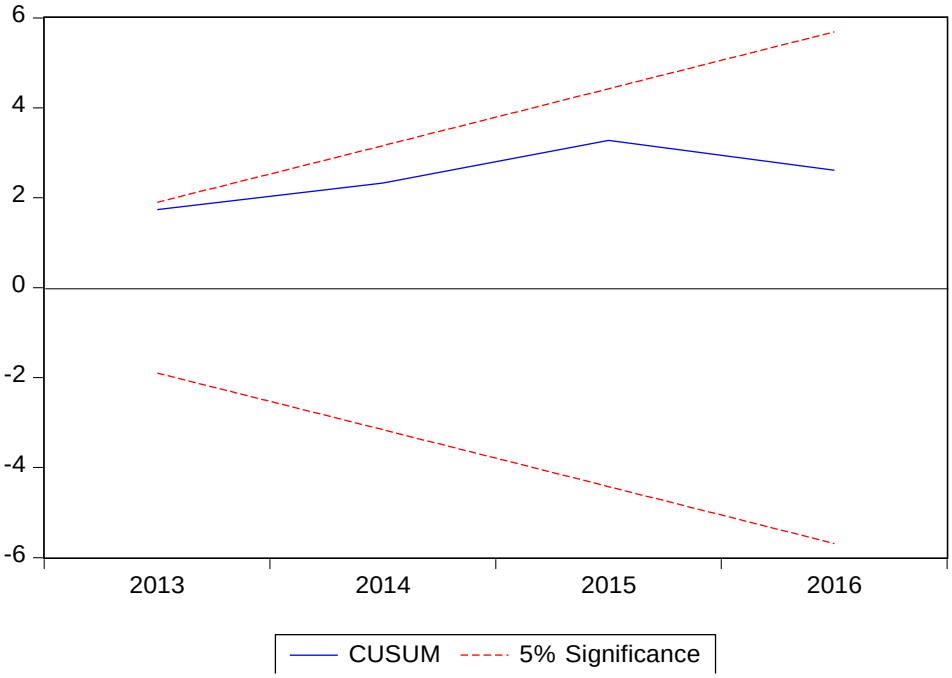
Following Jarque-Bera (JB) normality test, since the probability value (0.987) is greater than 0.05, we do not reject H0. We therefore conclude that the error term follows a normal distribution.

Stability Test

To check the stability of parameters CUSUM and CUMSUMSQ tests are used. Both tests confirm the stability of parameters in the model since it is within the boundary. This can be seen in the Figure 3

Figure 3


1.6
1.2
0.8
0.4
0.0
-0.4
2013
2014
2015
2016
CUSUM of Squares
5% Significance



Source: Authors' plot using E-Views 9.0

5. Conclusion and Recommendations

This study adopted the ARDL model to analyse the relationship between trade openness and female labour force participation rate in Nigeria between 1980 and 2016. The study found that trade openness is negatively related to female labour force participation in the short run and positively related in the long run. The different levels of education (primary and secondary) is found to be positively related to FLFP both in the short and long run which suggests that any of the levels of education fosters female labour force participation. To validate the empirical findings of the study, standard diagnostic test was applied on the estimated models. The major conclusion based on empirical findings of the study is that female labour force participation rate is increased by trade liberalisation/openness. We therefore recommend the following:

i. Efforts to promote international trade should be made by the government and Nigerian citizens since trade fosters women participation in the labour force which could increase productivity and reduce the gender gap in the labour market.

ii. A permanent and consistent increase in government expenditure on education must be efficient enough to provide all social and fiscal infrastructures that will encourage schooling

among Nigerian female and all citizens at large. Policies that encourage and improve education in private schools should also be encouraged. This is because female education leads to higher involvement in female labour force participation which will reduce the gender gap in the labour market.

iii. Greater emphasis on policies and programmes that would enlighten women on measures to take to prevent human immunodeficiency virus (HIV) should be made by government and NGOs. Also the government should provide more efficient and stable health centres that will sustain the supply of drugs for HIV patients and keep them strong while they live.

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