

# **Female Labour Force Participation and Economic Development: Does the ‘U’ Shaped Hypothesis Hold for West African Countries?**

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## **Abstract**

Theories show that there is a relationship between female labour participation and economic development, such that as a country transits from informal economy to formal economy, female labour force participation (FLFP) changes. This change and re-organisation of economic activities and the production system have further affected the position of women in the economy. Among the theories for understanding the phenomenon is the ‘U’ shaped hypothesis by Claudin Goldin. This study sourced data from World Bank Data Bank and investigated the validity of ‘U’ shaped hypothesis in 4 selected West African countries based on their gender ratio labour participation ranking. Using fixed effect estimation technique and ‘UTEST’ technique as suggested by Lind and Mehlum (2010), the study discovered that there is no clear evidence of ‘U’ shape in selected West African countries. While there is an inverted ‘U’ shape relationship between FLFP and economic development in Nigeria and Togo, there is no evidence of ‘U’ shape in Ghana and Mauritania. However, analysis on country specific level reveals the peculiarity of each country. This study concludes that there is no ‘U’ shape relationship between female labour

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force participation and economic development in selected West African countries. It is recommended that governments in West African countries should increase women empowerment and provide family support/child care services for working women.

**Keywords:** Female, Labour Participation, ‘U’ Shaped Hypothesis, Economic Development, Claudin Goldin, West Africa, Gender ratio of labour participation, UTEST.

### **Introduction**

This study investigates the relationship between female labour force participation and economic development by testing the validity of ‘U’ shaped hypothesis as propounded by Claudin Goldin in four (4) selected West African countries, namely, Nigeria, Ghana, Togo and Mauritania. Using panel data between 1990 and 2015, these countries were chosen based on the ranking of the Population Reference Bureau (2015) of gender ratio of female labour force participation in Africa. Female participation in the labour force is regarded as the driver of the economy as well as the outcome of growth and development in the country (Institute of Labour Economics (IZA), 2014). Though women participation in the labour force varies across countries, reflecting disparities in economic development, culture and ideology, norms, education level, fertility rate, access to child care and other supportive services, yet, literature has made it known that women dominate the informal sector and it has overall larger source of employment for females than it is for men (Chen, 2011). On the other hand, women represent 49.6 percent of the total world population but only 40.8 percent of the total workforce in the formal sector (World Bank & IFC, 2011).

As globalisation spreads and more developing economies modernise, there has been a shift from the informal sector to formal sector in most developing countries in Asia and South America (Verick, 2006). Increasingly emerging economies in Asia and South America are becoming the workshops of the world and females are gradually being incorporated into the formal production and manufacturing value-added chain (World Economic Forum, 2018). This transition seems to have left Africa behind as its economy is

still driven essentially by the informal sector (Stuart, Samman & Hunt, 2018). Specifically, in most African countries, about one third of the female populations are often involved in limited economic activities. Women make up about 50 percent of Africa's growing population, yet, they are under-represented in economic, social and political sphere (Ernst & Young, 2011). In the seven largest economies in Africa, namely: Nigeria, South Africa, Algeria, Morocco, Angola, Egypt and Libya, the average female labour force participation averaged about 32.7 percent (World Development Indicators, 2011). According to World Population Data Sheet (2015), in West Africa, Togo has the highest female labour participation (82.2%) and the least is in Mauritania (29.4%), while Nigeria, Africa's most populated country, happens to be in the middle range (48%).

Theories have shown that there is a relationship between female labour participation and economic development, such that as a country transits from informal economy to formal economy, female labour force participation changes (Robinson, 2005; Tsani, Paroussos, Fragiadakis, et al., 2012). Some of the theories that relate female labour participation with economic development are the emancipation theory, 'U' shaped hypothesis and constancy theory. However, the 'U' shaped hypothesis by Claudin Goldin stands out as it explains how female labour force participation decreases and later increases as any economy makes the transition from informality to formality. The 'U' Shaped hypothesis has been used to analyse different sorts of female labour force participation and development within and among countries (Robinson, 2005; Tsani *et. al.*, 2012). Gaddis and Klassen (2012) argue that the effect of economic development on female labour force participation is more complicated than it is portrayed by most of the existing empirical studies. The study states that the feminisation of 'U' hypothesis is basically based on the premise of economic development as a process of profound structural change and socio-economic transformation, forces that are not totally captured by GDP level, not even under a nonlinear relationship, and that rely on the country-specific nature of growth process.

There have been several studies on female labour force participation in Africa. Some are country specific analysis (e.g, Yakubu, 2010; Adebisi & Onifade, 2014; Morikawa, 2015; Tinguim, 2016), while others are cross country analysis using data on Sub-Saharan Africa and Middle East and

North Africa (MENA) (see Robinson, 2005; Aboohamidi & Chidmi, 2013; Verme, 2015). However, there have not been studies on regional basis, particularly in West African countries.

This study fills this gap by investigating the validity of the ‘U’ Shaped Hypothesis as regards the relationship between female labour force participation and economic development in selected West African countries. This study is unique in a number of ways. First, it focuses on West Africa countries, an important sub-region in sub-Saharan Africa. Two, it uses the Population Reference Bureau to select four countries in the sample, based on their gender ratio labour participation, which reduces the tendency for ambiguous selection. Three, it uses both the fixed effect and the ‘UTEST’ techniques as suggested by Mehlum, (2010) for West African data. These three features are peculiar to this study and form the foundation of its originality

The rest of this paper is organised as follows: Section two defines the concept of female labour participation and reviews theoretical and empirical studies of female labour participation and economic development. Section three discusses the methodological issues, while section four presents and discusses the result. Section five concludes and makes policy recommendations.

## **Literature Review**

### ***Conceptual Clarification***

#### ***Female Labour Force Participation***

Female labour force participation can be defined as the female decision to be part of a country’s economically active population, either employed or unemployed, as opposed to being among those who are not working or seeking work, that is, the economically inactive population of the economy (ILOSTAT, 2013). McConnell, Brue and Campbell (2009) opine that the labour force participation rate is determined by comparing the actual labour force with the potential labour force or what is sometimes regarded as “age eligible population”. For example, in the United States the actual labour force comprises those who are employed and those who are unemployed but who are actively looking for a job while the potential labour force can

be grouped as the age eligible population which excludes young people under 16 years of age and people who are institutionalised such as in penal and mental institutions or nursing homes or over age 64. Also, according to Psacharopoulos and Tzannatos (1989), female labour force participation is the ratio of two numbers, in which the numerator represents individuals who are economically active (labour force) and the denominator represents the labour force and the inactive population. The inactive population excludes the categories of unemployable persons like children, inmates of institutions, the disabled and the elderly. According to the International Labour Organisation (ILO), female labour force participation rate is a measure of the proportion of the population ages 15 and above that is economically active: all people who supply labour for the production of goods and services during a specified period (ILO, 2015). In calculating Female Labour Force Participation Rate (FLFPR), we divide the number of females in the labour force by the number of females in the working age population. The FLFPR indicates the rate of female labour supply available to be used in the production of goods and services in a particular country or region over a specified period of time. The rate serves as an important indicator of women status and benchmark of female empowerment in the society (Kapsos, Silberman & Bournpoula, 2014).

#### *Theoretical Literature*

In literature, there is yet no consensus on how transition from informal economy to formal economy affects female labour force participation. Notwithstanding, there are three competing hypotheses: the ‘U’ shaped hypothesis, emancipation hypothesis and constancy hypothesis. The emancipation hypothesis states that there is a direct relationship between industrialisation and increasing employment and freedom for women. The hypothesis stipulates that industrialisation fosters a new mentality and disintegration of patriarchy ideology. This hypothesis has been tested by numerous studies, using both cross-country and single country data (Engel, 1986; Solati, 2015). On the other hand, the constancy hypothesis states that women always work and the curvilinear pattern is often discovered to be a statistical artefact due to the under enumeration of women’s work activity during industrialisation (Rau & Wazienski, 1999). Implying that until 1982

when the International Labour Organisation (ILO) gave a standard definition of labour force activity, census and data collection methods were inconsistent (Robinson, 2005). This means women are frequently under-represented in labour force activity in early and mid-industrialisation, due to the fact that many activities that were performed by women during these stages were ignored.

The ‘U’ shaped hypothesis states that at the early stage of economic development, when incomes are very low and when agriculture dominates, women are in the labour force more often as unpaid workers on family farms and in family businesses. Fertility rates are high because their economic engagements allow them to combine it with child rearing. As the society becomes richer and the structure of the economy shifts towards industrial production, formal sector based economy emerges and female labour participation will start to decline because of the introduction of new technologies and the incompatibility of wage work and child care (Goldin, 1995). The decrease in female labour force participation owes, in part, to an income effect, but it may be reinforced by a reduction in the relative price of home produced goods and by a fall in the demand for female’s labour in agriculture or informal sector. But as the country develops further female labour force participation increases once again due to the improvement in female education and the value of women’s time in market rises still further relative to the price of goods, they move back into the paid labour force as reflected in the rising portion of the ‘U’ shaped curve. Moreover, the fall in fertility, the increasing availability of part time jobs and greater access to child care facilities enable women to combine work outside the home with child rearing. At this stage of development, the substitution effect dominates and the income effect declines and female labour force participation is positively linked to per capita income (Psacharopoulos & Tzannatos, 1989; Mammen & Paxson, 2000).

While there is on-going debate within literature on the relationship between female labour force participation and economic development, this study considers the ‘U’ Shaped Hypothesis as the most appropriate for West Africa. It, therefore, tests the theory using West African data and through this improves the existing literature.

***Empirical Literature***

Tansel (2002) used ordinary least square technique to investigate the validity of ‘U’ shaped hypothesis in Turkey. The study used both time series and cross sectional analysis across provinces in Turkey. The time series indicated that there had been a sharp decrease in FLFP recently. However, the household labour force survey of the past decade showed that the rate of decline had slowed down. Data was pooled from 67 provinces to estimate the relationship between FLFP and a measure of economic development with other determinants. The variables are log of per capita GDP of the provinces, a linear and quadratic term in log of per capita GDP. The result showed that there was a negative and positive relationship respectively, indicating a “U” shaped relationship. Other determinants of FLFP are economic growth, female education, agricultural employment, all of which have positive coefficients. In a similar study, Cakir (2008) used descriptive and time series to analyse the reasons behind differences in FLFPR in Turkey. The effects of economic development, different unemployment patterns, urbanisation rate and total fertility rate on FLFP were found to be negative. While education and agriculture share in the employment had positive effects on FLFP. Time series evidence revealed the presence of considerable slowdown in the decline of FLFPR. Both econometric models and time series proved that Turkey was experiencing the downward portion of the ‘U’ shape, probably due to being at the early stage of economic development.

Olivetti (2013) used panel data estimation technique and found a consistent ‘U’ shaped relationship between women’s role in the labour market and the process of economic development both within and across 16 developed countries in America. Conversely, in India, using dynamic panel models, Lahoti and Swaminathan (2013) could not find a significant relationship between levels of economic development and women participation rate in the labour force. The study was conducted between 1983 and 2010. The result from the study suggested that growth in itself was not a sufficient condition for the increase in female participation outside the home, rather the dynamics of growth itself matters. Also in Pakistan, Muhajid and Zafar (2012) investigated the relationship between female labour force participation and economic development between 1980 and

2010. The study used autoregressive distributive lag model (ARDL) and found a long run and ‘U’ shaped relationship between economic development and female labour force participation.

Hartani, Bakar, and Haseeb (2015) tested the relationship between female labour force participation and female total fertility rate for six Association of Southeast Asian Nations (ASEAN) countries (Indonesia, Thailand, Singapore, Malaysia, Vietnam and Philippine) between 1995 and 2015. Panel co-integration approach was used and the result showed that a 1 percent increase in female total fertility rate caused a 0.44 percent decrease in FLFP. However, the highest negative effect was found in Indonesia and the least in Thailand.

Verme (2015) used unbalanced panel data analysis to test the validity of ‘U’ shaped hypothesis in the Middle East and North Africa region between 1990 and 2012. The study discovered that though the region has outperformed other world regions in terms of the main drivers of ‘U’ shaped hypothesis, yet, there is no clear evidence of a ‘U’ shaped relationship between FLFP and economic development. Belke and Bolat (2016) investigated the long run determinants of female labour participation. The study made use of a dataset consisting of 148 countries (divided into 36 developed and 112 developing countries) between 1991 and 2014. The study used both fixed effects model and System Generalised Method of Moments (Sys-GMM) estimator. The fixed effect results showed that the ‘U’ shaped hypothesis was valid in developed and developing countries, while GMM results indicate that ‘U’ shaped hypothesis is not valid in developed countries in this period. In a study of 40 countries of the world Choudhry and Elhorst (2018) investigated whether the labour force of women in 10 different age groups can be lumped together. Findings from the study revealed that for every age group and explanatory variables in the model, an evidence of ‘U’ shape is established. In addition, Altuzarra, Galvez-Galvez and Gonzalez-Flores (2019) examined the relationship between female labour force participation and economic development in 28 European Union countries for the period between 1990 and 2016. Using ordinary least squares, fixed effects and GMM. Findings showed that there is an evidence of U shape. The study divided these countries into old 15 EU countries and new 13 EU countries.



While a U shape relationship was seen in the new 13 EU countries, there was no evidence of this for the old EU countries. Uberti and Douarin (2023) empirically investigated the observed heterogeneity in the dynamic path of female labour force participation in the course development. The study used ordinary least squares and confirmed that the conditional relationship between female labour force participation and economic development is significantly U shaped in countries with a history of plough agriculture. However, the time pattern of female labour force participation in countries with no history of agriculture is effectively flat.

Jaffri, Javed and Asjed (2015) empirically investigated the effect of urbanisation on FLFP in Pakistan for the period between 1982 and 2012 using Autoregressive Distributive Lag (ARDL) model and Error Correction Model (ECM). Extending to recent empirical studies that reveal that urbanisation can have both positive and negative effect on FLFP depending on the dominance of added worker effect or discouraged worker effect. The study showed that urban growth and gendered wage ratio negatively affects FLFP while GDP/capita has a positive effect.

Fussell and Zenteno (2004) used data from Mexican urban employment surveys to analyse the shifts in the ranks of cities by total wage and non-wage FLFP. The study used 6 cities representing distinct urban economies to perform logistic regression analyses of individual and household determinants of FLFP. It was discovered that the characteristics of the urban economies interact with household and individual characteristics creating different magnitudes of effects on women's likelihood and type of work they engage in.

Considering the emergence and the rise of female employment in Muslim societies, Mehmood, Ahmad and Imran (2015) formulated an empirical framework for the factors influencing FLFP. Data was obtained from World Development Indicators for 41 Muslim countries between 2003 and 2013. The study used the Generalised Method of Moments (GMM). The decision to work is influenced by some pull and push factors as those of the western world women. Attainment of tertiary education and female labour force has a positive link. Education improves the possibilities of better jobs and respectable salaries. It gives the impetus to enter into the job market with confidence. Inflation, per capita income, GDP, male unemployment and the

number of children have a positive impact on FLFP, except for the latter. These reviews show that there is a scarcity of studies on FLFP in Africa and this study is an attempt to fill that gap.

## **Methodology**

### *Theoretical Approach*

The basis for the analysis of the relationship between economic development and female labour force participation lies in the ‘U’ shaped hypothesis. This hypothesis was propounded by Claudia Goldin in (1990: 1999). The hypothesis describes three stages in the relationship between FLFP and economic development. The first stage describes a high rate of FLFP driven by informality and social constraints that define women involvement in economic activities. The second stage involves a period of transition where FLFP falls because of low skill premium among women and persistence in social constraints. The third stage describes a period of rising FLFP as the economy moves toward formality thereby reducing social constraints and diffusing technology (Goldin, 1990: 1999).

### *Model specification*

Data for the study were sourced from World Bank data bank, covering the period 1990 to 2015 from four selected West African countries (Togo, Nigeria, Ghana and Mauritania). This study adopts Tsani, *et. al.* (2012) model specification with some modifications. The model took a lead from the specification of ‘U’ hypothesis which has been used extensively. The model is specified thus:

$$FLFP_{i,t} = \beta_0 + \beta_1 LGDP/P_{i,t} + \beta_2 LGDP/P^2_{i,t} + \beta_3 EDU_{i,t} + \beta_4 FER_{i,t} + \beta_5 TU_{i,t} + \beta_6 FU_{i,t} + \beta_7 MU_{i,t} + \varepsilon_{i,t} \dots \dots \dots (1)$$

Where  $LGDP/P_{i,t}$  and  $LGDP/P^2_{i,t}$  represent the log of real GDP per capita and its square. FLPR is expressed as the number of female labour participants aged between 15 and above and divided by the total female population of the same age group. EDU represents female educational enrolment, and different forms of unemployment; total unemployment, female

unemployment and male unemployment. These are used in order to evaluate the different aspects of unemployment rates.

This was actually overlooked by previous studies.  $\hat{\alpha}_{i,t}$  is an error term capturing all other omitted factors, measurement errors and possible misspecification. If the feminisation ‘U’ hypothesis holds we would obtain  $\beta_0 < 0$  and  $\beta_1 > 0$ .

**Sources of Data**

Data for the study were sourced from World Bank data bank and the Population Reference Bureau (2015). The World Bank data covers GDP per capita (GDP/P), Female Education Enrolment (EDU), Female Employment Rate (FER), Total Unemployment (TU), Female Unemployment (FU) and Male Unemployment (MU) spanning the period 1990 to 2015. Data sourced from the Population Reference Bureau (2015) was used to select 4 countries (Nigeria, Togo, Mauritania and Ghana), based on their gender ratio labour participation ranking. These four countries were chosen according to the criteria outlined in Table 1.

**Table 1: Criteria on the Choice of Countries**

Regions	<i>Highest gender ratio of LFPR</i>	<i>Lowest gender ratio of LFPR</i>	<i>Closest to the middle of gender ratio of LFPR</i>	<i>Highest population</i>
<i>Western Africa</i>	Togo	Mauritania	Nigeria	Ghana

Source: Author’s ( 2023) (Retrieved from World Population Data Sheet (2015); United Nations, World Population Prospect (2015).

The gender ratio of the labour participation rates as provided by the Population Reference Bureau of World Population Data Sheet shows the ratio of the female labour force participation rate over the male rate, as depicted in Table 1. The labour force participation rate is defined as the proportion of the population ages 15 years and above who are economically active, including those employed and unemployed.

**Results**

***Summary of Statistics***

Given the summary of statistics as depicted in Table 2, the basic characteristics of the series in the model is summarised in a meaningful way that patterns might be revealed. The estimated mean value which is used to examine the data distribution was high for each square of the log of GDP per capita (LY2) with about 58.41, while fertility has the lowest mean value of 5.52. As regards standard deviation, all variables except for the supply of female labour force participation exhibits low variability across countries in the study.

**Table 2: Summary of Statistics**

	<b>Mean</b>	<b>Std. Dev</b>	<b>Skewness</b>	<b>Kurtosis</b>
<i>SFLFP</i>	55.02	20.32	-0.22	1.45
<i>LY</i>	7.62	0.52	0.08	2.23
<i>LY2</i>	58.41	8.01	0.21	2.28
<i>MU</i>	7.75	3.38	1.32	3.89
<i>EDU</i>	40.51	6.65	-0.95	2.58
<i>FER</i>	5.52	0.69	-0.55	2.01
<i>FU</i>	9.45	4.10	1.22	3.46
<i>TU</i>	8.40	3.51	1.28	3.76

*Source: Author's Computation (2023)*

On the other hand, all variables except for supply of female labour participation, female education and fertility are positively skewed. The estimated kurtosis statistics of male unemployment, female unemployment and total unemployment are greater than 3, which indicate that the distribution of these variables is thicker and therefore implies the presence of heterogeneity in data. However, the kurtosis statistics of supply of female labour force participation, log of GDP per capita, its square, female education, fertility is less than 3, implying that the tails of distribution for these variables are thinner than the normal distribution.

**Panel Unit Root Tests**

This study used heterogeneous panel unit root test (ADF- Fisher) and homogenous panel unit root (Levin, Lin and Chin).

**Table 3: Results of Panel Unit Tests**

Variables	Heterogenous root (ADF-Fisher)	Prob.	Homogenous root (Levin, Lin & Chin)	Prob.	Order of Integration
SFLFP	17.50	0.03**	-2.62	0.01**	I(1)
LY	24.16	0.00***	-2.73	0.00***	I(1)
LY2	23.65	0.00***	-2.73	0.00***	I(1)
MU	65.69	0.00***	-8.15	0.00***	I(1)
EDU	64.25	0.00***	-7.95	0.00***	I(1)
FER	36.44	0.00***	-6.21	0.00***	I(1)
FU	64.36	0.00***	-8.01	0.00***	I(1)
TU	64.77	0.00***	-8.06	0.00***	I(1)

*Source: Authors' Computation (2023)*

*Note: \*\*\*, \*\*indicate significance @ 1% and 5% respectively*

This is important in order to determine the order of integration of series before embarking on panel co-integration test. The results as depicted in Table 3 show that all variables attained their stationarity at first difference. Hence, the study proceeded to conduct a panel co-integration test and found a long run relationship among the series under study.

**Data Analysis**

The results of pooled ordinary least square estimation, (PE) and fixed effect estimation (FE) are presented in Table 4. The result of the Hausman test allowed for the selection of fixed effect regression model. The result from the fixed effect shows that log of GDP per capita and its square are not significant, indicating the absence of a 'U' shape relationship between female labour participation and economic development.

**Table 4: Regression Results using Fixed Effect Estimation Technique**

	<b>Pooled Effect</b>	<b>Fixed Effect</b>
<i>SFLFP</i>	<i>Coef.</i>	<i>Coef.</i>
LY	-54.34***	-9.90
LY2	3.05**	0.64
MU	-29.88***	-9.21**
EDU	-0.49***	0.09
FER	-12.58***	-6.91***
FU	-23.25***	10.97
TU	52.99***	52.99
Constant	386.96***	122.80
<i>R-square: Within</i>	<b>0.59</b>	<b>0.73</b>
<i>Between</i>	<b>0.99</b>	<b>0.51</b>
<i>Overall</i>	<b>0.99</b>	<b>0.42</b>
	<b>Wald chi2(7) – 8998.88</b> <b>Prob&gt;chi2-0.0000</b>	<b>F(3, 93) = 17.52;</b> <b>Prob&gt;F= 0.0000</b>

Source: Author's Computation (2023)

Note: \*\*\*, \*\*indicate significance @ 1% and 5% respectively

While male unemployment and fertility are negative and significantly related to supply of female labour participation in all the four western African countries in consideration, female education, female unemployment and male unemployment are insignificant. On the other hand, results from pooled effect show that all variables of interest are significant and there is evidence of 'U' shaped relationship between female labour force participation and economic development.

This study proceeds to conduct country specific analysis as shown in Table 5. According to the theory of 'U' shaped hypothesis, for the feminisation 'U' hypothesis to hold the coefficient of log of GDP per capita and its square must be negative and positive respectively ( $\beta_1 < 0$  and  $\beta_2 > 0$ )

. Based on this premise, Nigeria and Togo have an inverted ‘U’ shape, while this was not found significant in Ghana and Mauritania.

**Table 5: Country Specific Analysis of Female Labour Participation and economic development**

	<b>Nigeria</b>	<b>Ghana</b>	<b>Togo</b>	<b>Mauritania</b>
<b>SFLFP</b>	<b>Coef</b>	<b>Coef</b>	<b>Coef</b>	<b>Coef</b>
LY	81.54***	-213.39	223.41***	2.78
LY2	-5.07***	14.09	-16.54***	-0.14
MU	-12.27***	117.81**	-19.99	-28.26***
EDU	-0.01	0.35	0.35***	-0.001
FER	-9.49***	0.06	-8.12***	-0.04
FU	-9.22*	114.19**	-13.14	-11.95***
TU	21.74***	-231.53**	34.19	40.21***
Constant	-224.63***	858.22	-654.92***	14.54
Overall R2	0.99	0.83	0.99	0.99

*Source: Author’s Computation (2023)*

*Note:\*\*\*, \*\*, \* represent 1%, 5% and 10% level of significance*

Meanwhile in Nigeria, male unemployment (MU), female employment rate (FER) and female unemployment (FU) have negative and significant relationship with female labour participation, while total unemployment (TU) has positive and significant relationship with female labour participation. In Togo, female fertility (FER) and female education enrolment (EDU) have negative and positive relationships with female labour force participation respectively. However, unemployment in all its varying forms was found to be significant in Ghana and Mauritania.

**Table 6: Result from U-test technique**

	NIGERIA		GHANA		TOGO		MAURITANIA	
<b>Extreme point</b>	8.042		7.575		6.752		10.265	
	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound
<b>Confidence Interval</b>	7.584	8.730	7.123	8.339	6.568	7.271	7.503	8.256
<b>Slope</b>	4.648	-6.730	-12.720	21.524	6.083	-17.178	0.748	0.544
<b>T-Value</b>	3.598	-5.722	-0.728	6.223	2.032	-3.720		
<b>P&gt;(T)</b>	0.001	0.000	0.238	3.58e	0.029	0.001		
<b>Overall ‘t’ value</b>	3.60		0.73		2.03		Extremum outside interval – trivial	
<b>Overall p&gt;(t)</b>	0.001		0.238		0.03		failure to reject H0	

*Source: Author’s Computation (2023)*

To further test and validate the presence of ‘U’ shape between SFLFP and economic development in all these countries, the study used a technique propounded by Lind and Mehlum (2010).

The results of ‘U’ test presented in Table 6 validate the presence of inverted ‘U’ shape in Nigeria and Togo.

**Discussion of Findings**

The results obtained in this study showed that there is no evidence of ‘U’ shaped relationship between female labour force participation and economic development in selected West African countries. Male unemployment and fertility both exert a significant negative impact on female labour supply. This indicates that male unemployment has discouraging-worker-effect on female labour supply, and as fertility increases female labour participation declines.



On country specific analysis, the result shows that there is an inverted 'U' shaped relationship between female labour participation and economic development in Nigeria and Togo, such that at the initial stage of their economies, female participation increases, as their economies progress, female participation reaches the peak and later drops. This finding contradicts Olivetti (2013) and Belke and Bolat (2016) that discovered a normal 'U' shape between FLFP and economic development. Meanwhile, total unemployment has a positive impact on female labour participation while male unemployment, female unemployment and fertility are negatively related to FLFP in Nigeria. On the other hand, in Togo, education and fertility are positively and negatively related to FLFP respectively. This implies that the growth in the economies of Nigeria and Togo is not driven by the formal sector in which females need to be engaged to be able to drive the upward trend of the 'U' shape. Other factors that could be responsible for this inverted 'U' shape are: (i) The conditions needed to drive FLFP as the economies progress has not been met, e.g increase in female education; (ii) Fertility has not dropped (this can be seen in the population of Africa versus Europe and the number of children per birth).

Notwithstanding, in line with Lahoti and Swaminathan (2013) and Verme (2015), there is no 'U' shape (either inverted or not) in Ghana and Mauritania. This suggests that growth by itself is not sufficient to increase women's economic activities in these countries, but the dynamics of growth matter.

### **Conclusion and Policy Recommendations**

This study tests the validity of 'U' shaped hypothesis for the relationship between female labour force participation and economic development in selected West African countries. The study invalidates the hypothesis for full sample data from the four selected countries. This study therefore concludes that there is no 'U' shape relationship between female labour force participation and economic development in West Africa. However, there is an inverted 'U' shape relationship between female labour force participation and economic development in two of the four countries, Nigeria and Togo. This might be an indication that those two countries are gradually making the transition from informal to formal economy, while the social conditions that reduce FLFP may also be changing. Also, male

unemployment and fertility rate are significant determinants of female labour force participation in West Africa. This study therefore recommends that policy makers in West Africa should improve access to education for women to increase their chances of working in the formal sector and also provide family support and child care services for working women so that they can work and fulfil their child-care responsibilities.

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