The Impact of Potency on Feminine Workforce Involvement in West Africa. Evidence from Countries in West Africa

John Wiredu[1,*], Qian Yang[1], Paul Otoo[2], Johnpaul Ogochukwu Igbonaju[1]

[1]School of Management, Northwestern Polytechnical University, Xi'an, China
[2]School of Economics and Management, Chang'an University, Xi'an, China
*Corresponding author: johnwiredu50@gmail.com

Abstract The last 30 years have also seen a dramatic global decrease in fertility in the developing world. World Bank has made known that significantly greater stages of Feminine work force participation can be connected to more returns on human capital and education. Feminine work force involvement is a major macroeconomic phenomenon which signifies growth and development for any country, and one vital part of this subject is the connection between potency and feminine labor force input. The study uses data from 18 countries in West Africa for the period of 1995 to 2015, to assess the outcomes of potency on female workforce involvement using the pooled OLS and Fixed Effects Method. The dependent variable was fertility rate whilst the independent variables are female workforce input, male work input, and growth rate. The study finding shows that the fertility rate over the period of 1995-2015 has a negative effect on female work force input and has been declining.

Keywords: potency, feminine, work input, growth rate, West Africa

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1. Introduction

1.1. Background

Participation of female labor forces (FLFP) is a significant growth and development factor [1]. Gary Becker addressed the household in the way economists have historically dealt with firms. The Author sheds latest light on how households allocate time. As a result, the Author noted the effect of wages on decisions that affect women's participation in the workforce, such as fertility and marriage. Becker correctly predicted that women would have fewer children and delay marriage longer as women's salaries rose. The theoretical basis for this study is based primarily on the substitution and income effects described in Gary Becker's work. The income effect suggests that the wage rate is negatively related to the hours that an individual supply to the labor market. For example, a wage increases results in higher incomes for goods and services, including leisure time (or time not spent on the labor market). Therefore, a wage increase can lead the individuals to spend fewer time on the market because he or she chooses to "consume" more leisure. The effect of substitution proposes an opposite result. According to the theory of substitution effect, the fee of relaxation time increases with increasing wages. An

individual will therefore need less leisure and spends more time on the market. The theory of fertility economic and the theory of maternal incompatibility provide two theoretical bases for understanding in what way potency relates to work. Firstly, the theory of maternal incompatibility focuses on the conflict between childcare and paid work, as childcare remains primarily the responsibility of women, and the theory suggests that women are less likely to continue working after birth [2,3,4]. Therefore, child care is linked to less labor market activity for women due to temporary or longer withdrawals from work [5]. Proponents expect that the increase in labor participation resulting from modernization and industrialization will reduce female fertility to an increase in their labor participation, which will lead to dramatic declines throughout the world. [6] in an illustration of 97 countries, uncovers that a rise in total fertility rate (TFR) of one match to a reduction of around three percent in the participation of women in the labor force. The normal TFR in this sample is 4.34, which means that the average female has a 13 percent reduction in labor force participation due to children. Other theorists have criticized the notion, emphasizing that it only exists where conflicts between working and mothering demands arise [3]. In contrast to the thesis of incompatibility that highlights non-economic fines, the theory of fertility economics places a greater finest on economic penalties, arguing that the rising economic activity of women rises

the relative expense of children, thereby reducing demand for children. Decreasing fertility is expected to increase female employment, which will alternatively reduce fertility through a variety of plausible mechanisms [7]. The outcomes of these demographic trends are, however, still understudied in developing countries. The rate of impact of any specific problem depends on the country being studied (the culture of the people and the structure of the household, to indicate a few the general value system of the persons concerned. If there is a lowly apprehension of a group of people, the consequences of such a study are undeniably disappointing. Caldwell also stated that "fertility research in less developed countries suffer from three limitations: an obsession with modernization, ethnocentricity and a restriction of the scope of the investigation to the point where the questions supply their own answers." Consequently, we can end that a good understanding of the society being studied is of paramount importance. As it can be said, the most harmful distortion relates to the way a researcher with inadequate understanding views the nature of the family as a social and economic unit. In spite of the variety of convincing arguments about why African fertility changes could yield socioeconomic growth and development at the individual and national levels, there has been no breakthrough so far. This issue aforementioned shows a number of limitations in theory, data availability, research design, and substantive focus applying this thinking in African settings, childbearing costs for employed women are expected to induce fertility transition, the study therefore seeks to find out if it is so in the West

1.1.1. Problem Statement

Developing countries have witnessed significant changes in both fertility and female employment and in the last thirty years. The evidence on the impact of potency on work force input remains spotty in West Africa. There are by now several literatures works which investigates the outcomes of potency on female work force participation in various regions, as well as few individual countries in West Africa. [8,9] but none in West Africa there is a gap in literature. The gap in literature is that many significant dynamics peculiar to African region are unnoticed when these studies use un-complex approaches to examine sensitive issues. The research therefore tries to find out the impact's potency has on feminine work force input pertaining to the West African region.

1.1.2. Research Significance

This study's contribution to literature is unique because this is the first study in relation to this subject done in West Africa. several studies have been done on this topic but most of these works are limited to individual countries in west Africa. This study uses comprehensively all countries found in the Economic Community of West African States (ECOWAS). The study seeks to apply best available gender theories in order to explain the impact of potency on feminine work input in West Africa. Although several gender theories have been proposed, their application in numerous areas of studies has produced good results. The study focuses on economic factors, (such as economic growth, employment rate, fertility rate). The analysis applies existing theory among numerous

gender theories. The outcome may aid identify why with existing laws, policies and conventions of gender inequality exist. The research is reasonable on the basis that it would serve as decent grounds for concept development which would give understanding that would be helpful in relation to further interventions for female fertility on labor input and to improve knowledge by obtaining opinions on the impact of fertility on female work input in West Africa. This would be a helpful resource which would be beneficial to individuals, organizations, the government and the academia.

1.1.3. Theoretical Significance

The study seeks to apply best available gender theories in order to explain the effect of potency on feminine labor input in West Africa. Although several gender theories have been proposed, their application in numerous areas of studies has produced good results. The study is to assess empirically the effects of potency on feminine work input in West Africa.

Practical Significance

The key aim of this research is to assess the effect of female fertility on labor participation in West Africa Countries. The study focusses on economic and social factors, (such as economic growth, education, and social norms). The analysis will apply existing theory among numerous gender theories. The outcome would aid identify why with existing laws, policies and conventions of gender inequality exist. The research is reasonable on the basis that it would serve as suitable grounds for concept development which would give understanding that would be helpful in relation to further interventions for feminine potency on work input and to improve knowledge by obtaining opinions on the impact of potency on feminine work input in West Africa. This would be a helpful resource which would be beneficial to individuals, organizations, the state and the academia. Also, this study is justified on the grounds that it will provide recommendation for further studies on the perceptions of causes female fertility on labor participation and its adverse effect on the international efforts to reduce the gender inequality gap though a lot of similar research has been done in this regard.

2. Literature Review

2.1. Fertility

Fertility is seen as one of the unambiguous of the main concepts in this study. It simply refers to giving birth and is biologically restricted to females between menarche and menopause which is usually from 15 to 45 years. Fertility trends are different with respect to countries over time [10]. The key measure of fertility discussed in this manuscript is the total fertility rate (TFR), an approximation of the sum of children a female would have, if she lives to the expiration of her procreative durations and if the program of age-specific childbirth rates remains persistent over her procreative lifetime [10].

Fertility is not simply childbearing but rather child rearing, the processes a woman goes through from caring for and fostering a baby from childbirth to adulthood, that

results to the bad or good association between potency and work force participation. Children require much care and attention when they are between infancy and preschool mothers have to closely supervise their children constantly and mostly, they might not be able to involve themselves in other activities because it is time consuming. [11] concept describes that the key cause of potency activities is the rising demand for woman workers. The causes which can perpetually impact a female's decision to labor involve; her husband's expected future incomes, her earning prospective and variations in preferences in the home. Usually, female work force input is interfered for short intermissions during which they have children. Ermisch's concept distinguished two types of women; "workers" and "non-workers. Thus, the opportunity cost of getting kids is high. A kid would demand extra of the couples' time and decrease the family's present income because of the loss of the wife's earnings. Once the number of women in the work force rises, fertility tends to decline during periods of economic growth.

Ermisch defines in his concept that as many females decide to work best of their lives, the normal age at earliest birth rises and the gaps between births reduces. Women employed in professional positions tend to wait long periods between marriage and the birth of their first child. He also identifies the inter-generational influences on female's labor force input. The daughters of working mothers are more possible to work in the course of their childbearing period. Thus, there is an indirect impact on a woman's fertility from her mother being employed. Believes that varying economic situations will cause couples to adapt their required family size. During economic development the ratio of two payee families with the least wanted family size would rise. Simultaneously, economic growth has the impact of increasing the preferred family size of single earner families.

2.1.1. Female Labor Force Participation

Female labor force participation (FLFP) is seen as essential indication of the degree to which women are included in economic activities of any nation [8]. Female work force participation is defined as the decision of women to be part of the working population as compared to being among economically inactive population. The basic measurement for FLFP is Female labor force participation rate (FLFPR). FLFPA is the proportion of the female working age population who are economically active. FLFP specifically measures the portion of a country's female population aged 15-64 who involves themselves in the work market, either by working or hunting for job. Many researchers have come out with various theories why women make the decision to participate in the labor force. Mincer in 1962 propounded the Work-Leisure Choice model stated that women decide on how much time to spend on work and leisure. The theory assumed that households; the suppliers of labor in an economy are rational and try to maximize their utility. There is a trade-off and this trade-off occurs when females allocate time between the alternatives. This means that consuming more of leisure and less of work results in less income and vice versa. Women therefore make decisions based on the income the market is prepared to pay. In [12] also expounded that the choice on whether to work or have more leisure time is hinged on the remuneration from work (wage rate). The increase in wage rate because of the participation in more of work will lead to what is known as the substitution effect. Cost of leisure time has now increased and individuals would rather devote their time to work. Consequently, as wage rate rises and individual's real income also rises, leading to an increase in normal goods (leisure which was earlier assumed as a normal good) the higher wage would make individuals consume more of leisure this will cause a decline in hours spent working causing what is termed as the income effect [13]. [9] observed that women's involvement in labor tend to change in relation to the growth stages of an economy. Thus, very poor countries tend to have higher female participation than rich countries and as the country begins to grow the female participation declines.

2.1.2. Growth Rate

The growth rate assesses how fast the economy of a country is growing. When the economy expands the GDP growth level is positive. If it's growing, businesses, jobs and as well as personal income will also grow. But if it expands above 3-4 percent, then it could reach the peak. During that point, the bubble bursts and economic growth stalls. If it's contracting, then businesses will hold off financing in new procurements. Businesses stop hiring new employees until they are self-reliant the economy will progress. This depresses the economy. Without jobs, customers have less cash to spend. If the GDP growth rate goes negative, then the country's economy is in a recession.

2.1.3. Empirical Studies

A lot of notice has been drawn to the connection amid population advance and economic improvement, and one significant part of this interrogation is the link amid fertility and female work force involvement. Differences in female work force involvement and fertility associations have been described by the motherly role unsuitability hypothesis, which mentions that an opposite relationship occurs between women's employment and fertility only when the roles of being a worker and mother are conflicted. Since the earliest two decades, it is evident that Africa is gradually picking up in development. Most African governments have made substantial improvement in the legal, regulatory and policy framework to enhance women participation in the formal labor markets [14]. There have been few studies by several authors on why women get involved in labor force in Africa. [15], assessed the impact of education on work force involvement of married females and confirmed not just the effect of women education on work force involvement, but likewise that the husband's education positively influences the work force input of married women. [16] studied the determinant of woman work force input and found that both women's educational achievement and fertility decide women's labor force participation. Also, [17] used data from Ghana living standard appraisal to estimate the feminine work force participation and potency models and supposed that the two theories (labor force participation and fertility decisions) are intensely connected with each other and as such it must be learned together. The study showed that education has a negative effect on fertility whereas education and decreased family

size increase work force involvement in Ghana. In South Africa, female work force input has increased substantially over the earlier two decades. [18] found out that notwithstanding the progresses in female educational achievement and the extension of the market economy, the rate of feminine work force input is still little compare to their man counterparts. The connection between fertility and employment is vital to demography because of its influence on the fertility change and women's socio-economic standing in developed and developing areas. Accordingly, it has been learnt extensively at different levels in industrialized countries. While the fertility-employment connection at the micro-level in Western nations has been mostly negative, albeit current evidence of a steady setback in the direction from macro findings [19], the micro indication on less developed countries has produced varied results. In line with the developed country evidence, some researchers find the association between fertility and employment to be negative, e.g., [20]. Other researchers discover no association [21] whereas [21] discover no connection in the short period but a positive one above the long period.

A few empirical studies done using SSA data according to [22,23] offer evidence on the relationship at the micro-level. [24] observe that beyond other factors, there is a connection between employment and cost of child care in Kenya. He found out that fertility indirectly (based on increases in institutionalized childcare costs) impacts employment negatively, offering support to the incompatibility thesis. [23] study the connections among schooling, employment, and lifespan fertility differences in Kinshasa, Democratic Republic of Congo. They study how contemporary sector workers in view of education exhibit significantly lower fertility as compared to their informal sector peers that is labor fertility conflict and settle both education and employment status will be crucial to a sustained potency decline. The evidence from the [22] study is in line with what [23] concluded. In Addition, [22] in his study finds a role conflict in Lomé but not in Dakar. He stipulates that there is a negative association between female paid employment and fertility in Lomé but no noted relationship in Dakar, in his study evaluating the impact of employment potency in two culturally distinct settings - Dakar (Senegal) and Lomé (Togo). This result sharply conflicts the industrialized world. Comparative proof on the work-fertility association in developing nations as a whole is unusual, with the only proof based on the United Nations evaluation of the Global Fertility Survey data of the 1970s (United Nations 1987). But this proof is now out-of-date. A latest cross-country study of the impact of fertility on employment organized by [6] is coherent with the United Nation (1987) results. Nevertheless, this latter study is global, including both advanced and developing nations. Against this background, large-scale literature on the work potency association has been sparse in Africa, partly because to a perceived weak link between the two variables and partly due to until recently, data scarcity.

[8] in their paper the impact of fertility and education on feminine work force input in Ghana, focusing on the part played by fertility and education sought to find forces behind female work force participation for urban and rural dwellers in Ghana. The study applied a logistic regression on the Ghana living standards appraisal five on 8,687 households. They find out that women with basic and tertiary education have a higher propensity of involvement in labor force than those with now educational background. Their estimate tolled a different line when they saw a positive marginal effect for women with children, signifying that having more children increases the probability of participation. This observation was more noticeable in the rural urban estimates. The paper advocates that women's labor force input and household production are complements rather than substitutes considering the fact that women dominate in areas of self-employment and/or informal sector where women are able to combine work and household production. Audrey Siah and Grace Lee in their paper female labor force participation, infant mortality and fertility sought to study short-run and long-run connection and causality amid FLFPR, infant death rate and potency in Malaysia. The study uses unit root tests which permits two structural breakdowns, and these break periods are then adopted as figure variables in the limits testing process in an autoregressive distributed lag (ARDL) modelling method plus Granger-causality tests. The outcomes indicated that mortality variation has a significant and progressive long-run effect on potency rate and women's decisions on child bearing are unchanged by their occupation state. They also did not find any indication that the presence of children hampers re-employment and continuous female employment. Margit Bussmann in 2009 found out that there is a negative association between fertility and FLFP thus giving birth to more children increases the number of activities in home production which is supposed to be done. Since household production is mainly done by females, this reduces the time and energy which would have been used to earn an income. However, in [25] in their study found out that there is a positive connection amongst fertility then Female Labor Force Participation in OECD countries. They observed that the relationship is tied to economic development or growth of the country. Thus, if the country is not very industrialized there is a negative relationship and if the country becomes well developed the relationship shifts to positive. [6] in their study on Fertility, female labor force participation, and the demographic dividend tried to find out the effects of fertility FLFP in a group of countries using abortion regulation as a mechanism for fertility. They found out that legal controls on abortion decreases fertility and quote that, on normal, a live birth reduces a woman's participation in labor by almost two years through her reproductive life. Their result show that behavioral variation, in the shape of increased female labor supply, contributes to economic growth during the demographic transition when child bearing decreases. [12] in Europe tried to explore impact of fertility on work emphasizing their direct and long run effects. Using dynamic simulations of labor supply in different assumptions concerning the exogeneity of productiveness and modelling assumptions associated to initial settings, unstudied heterogeneity and serial correlation in the error terms. They find large straight and long-run impact of giving birth whiles being employed, and these effects vary greatly across countries. They also find that within nations the outcomes are subtle to the statistical hypothesis made

on earlier conditions, the addition of serial correlation and the hypothesis of firm exogeneity of kids. Though, the pattern across states is robust to these suppositions. We display that such outlines are largely coherent with prevailing institutional variances associated with the flexibility of the job markets and family rules. A researcher by [26] also revealed that women's full-time employment and country level employment rates have negative effect on fertility, when they tried to investigate female employment and fertility in developed countries. They used hierarchical Bayesian ideal to analyze individual data pertaining to country- level from 1995 to 2000.They found out fertility will reduce employment They noted that though child care enrolment and services available will reduce the rate at which fertility would have decreased.

[27] attempted to do a large-scale historic analysis to of fertility trend and labor force involvement using data from 21 Sub-Saharan countries from 1991 to 2005. He used a multi- method analysis utilizing DHS surveys of these countries to compare their fertility changes that is whether fertility will continuously decline or there will be an increase. He found out that fertility in these African countries were varied. He established that some countries had negative effect and while other countries registered positive effects. The main limitation pertaining to these studies is that many of these studies done in Africa focused on individual countries and used simple descriptive analysis with significantly few studies in applying statistics specifically to determine correlation between the determinants and the main cause. To my knowledge the gap in literature is that many significant dynamics peculiar to the West African region are overlooked or missed when these studies use simple methods to analyze different unique set of factors. This study proposes to identify and analyze demographic, institutional and social factors specific to the West African region, an area currently under- researched in literature.

3. Methodology

3.1. Data Collection

Secondary dataset used in this study was accessed from World Bank and International Labor Organization (ILO) database. The World Bank's group, United Nations in particular presents a number of indicators on fertility rate, education and policy relating to women's economic participation and entrepreneurship. The study uses data from 18 countries in West Africa from the period of 1995 to 2015 with total observations being 378.

Table 1. List of countries used for the regression

Benin	Gambia	Niger
Burkina Faso	Guinea- Bissau	Nigeria
Cameroon	Equatorial Guinea	Senegal
Cote d'Ivoire	Liberia	Sao Tome Phillipe
Cape Verde	Mali	Sierra Leone
Ghana	Mauritania	Togo

Table 2. Statistical variable description for the model

Variable	Description	Mean	Std. Deviation	Min	Max	Number of Observation
FT	Female	0.7361683	0.0820222	0.3754807	0.8878985	378
FL	fertility rate	49.8873	15.00409	22.2	75.8	378
ML	Female employment rate	71.59815	8.394963	58.2	88.3	378
GR	Male fertility rate Growth rate of total employment	4.831409	7.429209	-30.14522	106.2798	378

3.2. Econometric Analysis

3.2.1. The Empirical Model and Estimation Strategy

The econometric analysis considers labor force input rates of active fertile women between 15 years and above for the set of West African countries. Cross country regressions are represented by a panel of 18 developing countries for the period of 1995 to 2015. As methodology, the study therefore uses pooled OLS and also fixed effects in analyzing the effects fertility has on feminine labor force input in West Africa. The panel data approach allows us to control for heterogeneity, as well as test for more behavioral models than purely cross section or time series. This helps us to get a more informative analysis of the region. The pooled OLS is effective when there is homogeneity in the countries' panel data. However, there are differences so there is the need to include into the pooled OLS fixed effects method to cater for the inconsistences that occur as a result of the Pooled OLS.

The study uses a regression analysis where all variables go into logarithms to ensure that parameters are not taken as elasticities. To get rid of unit measuring difficulties and differing effects. The study in trying to find the effects of fertility on female employment used the pooled OLS with fixed methods to regress the fertility rate (FT) female employment rate (FL), male employment rate (ML) and growth rate (GR) and then add the log (FR) to the other three variables. To investigate the effect of fertility on female labor-force participation in West Africa may be subject to time lags. The study captures the influence of specific economic and social characteristics through a simple specification that links labor force participation and its main determinants as depicted in the literature:

$$FTit = a + \theta.FL + \delta.ML + \gamma.GR + \epsilon it \qquad (1)$$

$$\log(FTit) = a + \theta.\log(FL) + \delta.\log(ML) \\ + \gamma.\log(GR) + \epsilon it \qquad (2)$$

For the study, the growth rate will also serve as an independent variable because if there is a rise in the economic growth of the country women will be able to get jobs with ease thereby female labor participation will be high and when there is an economic recession or unemployment less women will be employed. Thus, the growth rate is performing a huge role as an independent variable of the study. All variables used in the study have been clearly defined for accurate calculation.

3.3. Type and Source of Data

This study used secondary data from journals, periodicals, statistics, newspaper and newspaper reports. Also, official websites such as ILO database on www.ilo.org, World Bank Group on www.worldbank.org, www.un.org and www.nepad.org. journals databases sites from the Elsevier and web of science

4. Analysis of Empirical Results

4.1. Fertility in West Africa

Figure 1 presents the fertility rate in West Africa. It shows the total births of women in West Africa. The highest fertility rate was recorded in Niger and Mali with a ratio of 1: 7 children from 1995 but declined gradually globally in 2015. Cabo Verde had a rate of 4.5 in 1995 but reduces to 3.2 in 2015. Generally, the fertility rates declined in all countries but at a slow pace. The reason for the fertility decline is attributed to the effects of women participating in labor, or governments policies etc.

4.1.1. Male and Female Work Force Input

In 1995 the gap between women and men force is declining showing that more women are involving themselves in the Labor market. The early1990s saw women participation in labor force to be very low in most west African countries. This may be attributed to the fact that by that time all these countries were into Agriculture and mainly subsistence agriculture. Women took charge of giving birth and taking care of them whilst their husbands farmed to feed their family. In 2000s when government policies in West African countries and legal conventions were advocating for gender equality, education of women and as well as economic rights of women to work. examples are: In 1995 Convention on Elimination of all kinds of Discrimination Against Women (CEDAW), New Partnership for African Development (NEPAD) and the Beijing Conference. Internationally, there were general advocation for women empowerment.

4.1.2. Growth Rate

Figure 2 therefore tries to see the economic level of the countries in West Africa. When a country's growth rate is high it signifies that the country is economically stable. studying the figure, we can see that Liberia in 1997 had the highest economic growth rate of over 100 in 2003 their growth rates decreased drastically because of war. Nigeria also had a high growth rate with 33% in 2004 whiles in 2015 all growth rates in the countries are low with the exception of Sao Tome which decrease to negative in 2015. When economic growth rates are high it implies that there is an increase in job therefore a lot of women will be employed. In the same vein, when there is a recession there will be unemployment so it is assumed that women's participation in the job market will reduce.

4.2. Regression Analysis

Table 3 displays the regression gotten from the usage of the pooled OLS method. From the table, the model shows that two of the independent variables were significant at 95% level in Pooled OLS estimation (LogFL=0.002* and LogML=0.001*). This indicates that LogFL and LogML may be good explanatory factors for the changes in the female employment rate. However, the coefficient on LogFL is negative and significant in Pooled OLS estimation. One of the independent variables (LogGR) was insignificant (Table 3). The coefficient on LogFL is negative (-0.113, see Table 3). This indicates that keeping all variables constant, female labor participation predicts fertility rate by 11.3%. The negative sign means a rise in FL will decrease FT and vice- versa. Also, the coefficient of LogML is 0.377, indicating that by keeping all variables constant, the male labor participation predicts fertility rate by 37.7%. The positive indicates a rise in male labor participation will increase fertility rate by that margin. However, the coefficient of growth rate is very low at 0.018. This suggests, by keeping all variables constant, growth rate in the ECOWAS region only increase fertility rate by 1.8%. Thus, the influence of growth rate does impact on fertility rate marginally.
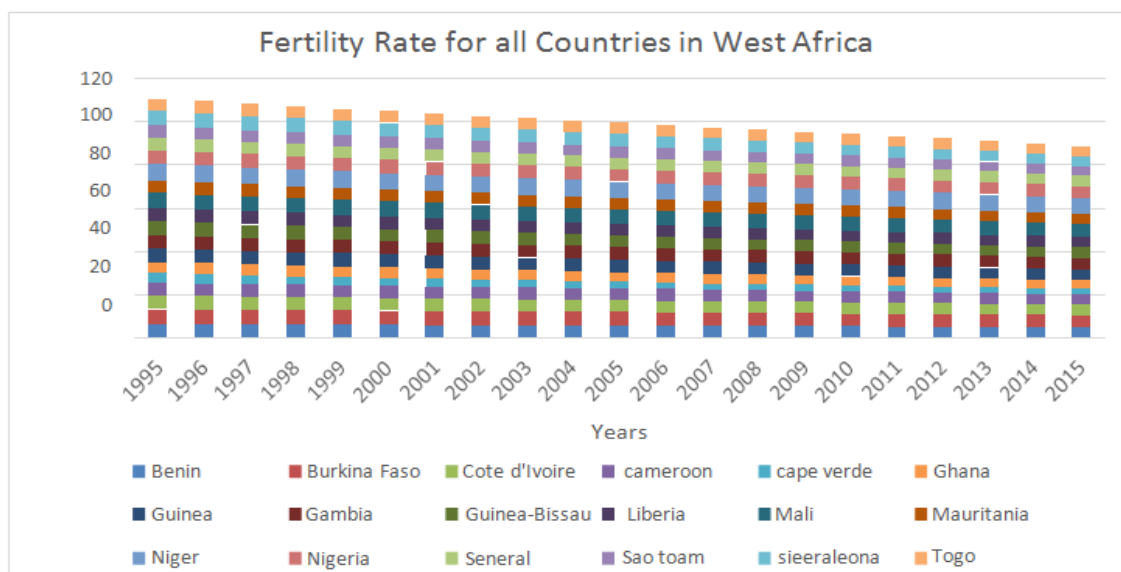

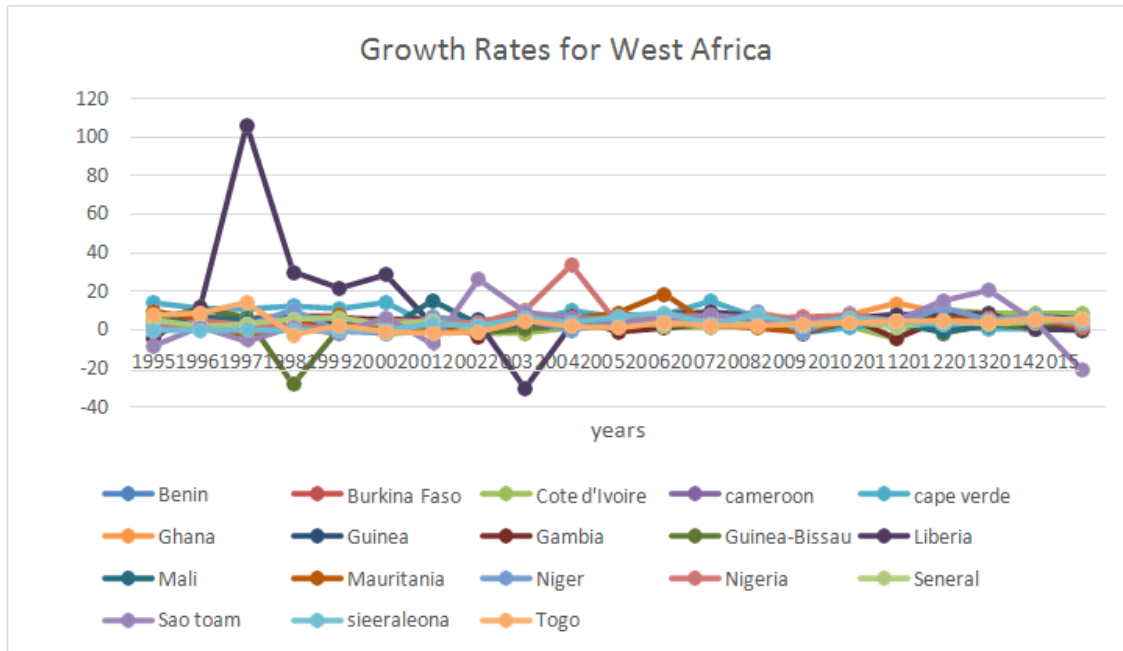**Figure 1.** Fertility rate for all states in West Africa (Source Author's construct, 2021)

Figure 2. Growth rates for West Africa (Source Author's construct: 2021)

The model for the Pooled OLS

$$\log(FT) = 0.214 + 0.377\log(ML)it$$
$$- 0.113\log(FL)it + 0.018\log(GR)it + \epsilon it$$

Table 3. Regression coefficients for the model estimating the impact of potency on female work force input using Pooled OLS dependent Variable Log FL using robust test

Log FT	Coefficient	Robust Standard Error	t-statistics	P value (P<0.05)
C	0.214	0.1660	1.38	1.170
Log FL	-0.113	0.0363	-3.11	0.002*
Log ML	0.377	0.110	3.44	0.001*
Log GR	0.018	0.156	1.38	0.380
Adjusted R- squared	0.0358			
R-squared	0.0443			
F-statistic	4.24			
Prob(F-statistic)	0.006			
No of observations	339			

* Significance level at 95%
Source Authors construct:2021.

Table 4 presents results of regression coefficients for the model estimating the impact of potency on female work force input using fixed effects method. In fixed effects method, unlike the Pooled OLS, the model considers characteristics of individual countries in its estimation. The overall model is statistically significant (F-statistic=0.002). All the independent variables are statistically significant at 95% (P=0.000). The result shows that fertility rate strongly and negatively correlated (-0.744) and significant (at P<0.000). The model estimation provides good results that explains the relationship between fertility rate, female labor participation, male labor participation and growth rate. The results suggest that female fertility over the period 1995-2015 has been on a declining trend. This result explains the sudden decline in fertility rate in the

ECOWAS region as discussed in section 4.2.1. The explanation to this result is that in the ECOWAS region, women who participate in labor force has to delay their child birth because of the time spent to childbearing and raising children to rather concentrate on their careers and vice versa.

Table 4. Regression coefficients for the ideals estimating the impact of fertility on female work force participation using fixed effects method; dependent Variable Log FL using robust test

Log FT	Coefficient. Std.	Standard Error	t-Statistic	P>/t/
C	0.883	0.414	2.13	0.048
Log FL	-0.800	0.184	-4.33	0.000
Log ML	0.636	0.232	2.73	0.014
Log GR	0.019	0.0144	1.35	0.195
Adjusted R- squared	0.0358			
R-squared	0.014			
F-statistic	7.66			
Prob(F-statistic)	0.002			
Correlation	-0.744			
Number of observations	339			

* Significance level at 95%.

These results contrast similar studies by [25] who found a positive connection between fertility and Female work force input in industrialized countries. This contrasting result is attributed to the following reasons. Firstly, industrialized nations have many child care facilities to cater to children. These developed countries have a high standard of living, and women are better paid than their counterparts in the ECOWAS region, who are primarily underpaid and cannot afford child care services. The coefficient on LogFL is negative (-0.800, see Table 4). This indicates that keeping all variables constant, female workforce input predicts fertility rate by 80%. The negative sign means a rise in FL will decrease FT and vice-versa by a threshold of 80%. Similarly, the

coefficient of LogML is 0.64, indicating that by keeping all variables constant, the male labor participation predicts fertility rate by 64%. The positive indicates a rise in male work participation will increase fertility rate by that margin. However, the coefficients of growth rate are very low at 0.019. This suggests, by keeping all variables constant, growth rate in the ECOWAS region only increase fertility rate by 1.9%. Thus, the influence of growth rate does impact on fertility rate marginally.

The model for the fixed effect

$$\log(FT) = 0.883 + 0.636 \log(ML) it$$
$$- 0.800 \log(FL) it + 0.019 \log(GR) it + \epsilon it$$

4.3. Diagnostic Test: Heteroskedasticity

It occurs when the variation of the error terms differs across observations. Data set is heteroskedastic if distribution has different variabilities (statistical dispersion) within different columns. Hence heteroskedasticity is the lack of homoskedasticity. Performing a regression analysis requires doing a heteroskedasticity of its variables. Presence of homoskedasticity invalidates statistical significance of results, which means that errors in the model are uncorrelated and their differences do not differ with the outcomes being modeled. The Breusch–Pagan is used to test for heteroskedasticity in a linear regression model. It tests whether the difference of the errors after a regression is reliant on the values of the independent variables. In this situation, heteroskedasticity is present. Test was conducted in Stata software using command "hettest" and presented following results:

- Ho Constant variance
- Variables fitted values of logft
- chi2(1) = 51.82
- Prob > chi2 = 0.000

Results showed that there is the evidence of heteroskedasticity.

4.4. Diagnostic Test: Multicollinearity

To demonstrate the impacts of diverse levels of multicollinearity on regression valuations, multicollinearity was evaluated by means of variance inflation factor (VIF) [28]. This assesses the inflation in the discrepancies of the parameter valuations due to multicollinearity possibly triggered through the correlated predictors. This is essential when at minimum two extremely correlated predictors are measured instantaneously by regression model. The adverse effect of multicollinearity in regression examination is very well accepted and much care to its outcome is written in the literature. The statistical literature stresses that the key problem connected to multicollinearity involves unstable and biased standard errors directing to unstable p-values for evaluating the statistical importance of predictors, which might result in unrealistic and untenable interpretations [29,30]. If the VIF is higher than 10 then there exist multicollinearity and vice versa. Results showed that the null hypothesis is rejected, which is no evidence of multicollinearity.

Table 5. Multicollinearity results

Variable	VIF	1/VIF
Log ML	1.40	0.713
Log FL	1.39	0.721
Log GR	1.02	0.982
Mean VIF	1.27	

5. Conclusion

Referencing from the general results of the estimation done by pooled OLS and fixed effects method there is a negative relation between the fertility and work force participation hence fertility has a negative effect on work force participation of women. All the independent variables are statistically significant at 95%. The result also showed that fertility rate strongly and negatively correlated but significant using the fixed effect method. The model estimation provides good results that explains the relationship between fertility rate, female labor participation, male labor participation and growth rate. The results suggest that female fertility over the period 1995-2015 has been on a declining trend. This result is explained in the sudden decline in fertility rate in the ECOWAS region. The explanation to this result is that in the ECOWAS region, women who participate in labor force have to delay their child birth because of the time spent to childbearing and raising children to rather concentrate on their careers and vice versa. Most researches done on this topic find that the impacts of fertility on female work force participation to be negative contrasting these researches is [25] who found a positive connection between fertility and female work force participation. The following were reasons attributed to the decline. There are more care facilitates in advanced economies and another reason was due to the fact more women are better paid in developed nations than in developing economies. The result also found female labor participation, when other variables are kept constant, contributes nearly 80% to reduction in fertility rate. On the other hand, male work force participation will predict fertility rate by 64% when all other variables are kept constant. Only growth rate predicts fertility rate marginally in the study area by 1.9% when all other variables are kept constant.

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