THE SUPPLY OF FEMALE LABOUR FORCE PARTICIPATION IN SELECTED AFRICAN COUNTRIES

ABSTRACT

In Africa, women constitute a great spring of manpower to sustainable development and are therefore a powerful but untapped economic resource. This study investigated the supply determinants of female labour force participation in selected African countries using secondary data sourced from the World Bank Data Bank. The study used ARDL procedures of dynamic panel model of Pooled Mean Group (PMG) and Dynamic Fixed Effect (DFE) to examine the relationship among the variables of interest for the period between 1990 and 2015. The study found a long run relationship amongst these variables and revealed that male unemployment, household income, female education, and fertility were the supply determinants of female labour participation in selected African countries. Based on the above findings, governments and policymakers in Africa should improve efforts in bridging the gender gap in employment by ensuring gender-sensitive policies and removing all forms of institutional barriers to female employment and productivity in the economy. They should also bear in mind the aftermath of employment policies on the female supply side. In all, female labour participation should be encouraged to facilitate economic development in Africa countries and in Africa as a whole.

Keywords: Supply, Female, Labour Participation, West Africa
1.0 INTRODUCTION

Female labour force constitutes about half of any country's labour force and it makes up substantial human resources a country can possess. Women are catalysts for change and good managers. One of the strong phenomena of recent times in the world has been the extent to which female have increased their share of the labour force by increasing participation in paid work, thus driving employment trend and collapsing the gender gaps in labour force participation rates (Verick, 2014).

In Africa, women constitute a great spring of manpower to sustainable development and are therefore a powerful but untapped economic resource. However, socio-economic and cultural background exerts an important influence on the women life cycle. Hence, the stalled or slow increase in female labour force participation in Africa from the 1990s to date (World Development Indicators, 2015). African women face a chain of barriers to achieving their full potentials, ranging from differential in educational attainment and quality, interruption of labour force participation related to fertility and child rearing, discrimination in term of employment practices and wage determination, relatively fewer role models, vulnerability and weak bargaining power, and environment that may be unfriendly to female membership of the workforce (South Africa's Report, 2015). Others are gender norm, restrictive cultural practices, discriminatory laws, and highly segmented labour markets. Empowering women and eradicating gender inequality could improve the productive potential of billions of African women thereby delivering a huge boost to African development potential (African Development Bank, 2015).

Female labour force participation rate is lower in the Middle East and North Africa than other regions of the world (Robinson, 2005). Young people entering the labour force, particularly women, face extremely high levels of unemployment. According to the World Bank, female unemployment rates are as high as 50 percent in some countries (World Development Report, 2012). High unemployment rate discourages women from joining the labour force and also limit the economic opportunities available to women.

There are several factors that could be responsible for low female labour participation in Africa, these are; low level of educational attainment and skill, reproductive function of women, urbanization, non-availability of child care facilities and other forms of discrimination against women (Tsani, Paroussos, Fragiadakis, Charalambidis and Capros, 2012). Other reasons have also been suggested for the lower female participation rates in Africa, particularly Northern Africa, for example, that low female employment has its roots in religious values and norms. Nevertheless, while these values may have affected the region social and legal conventions, it is intuitive to say that they are directly responsible for gender differences in economic inclusion.

Evidence from World Development Indicators (2015) reflects the gender trend in labour force participation in the world. The trend shows that the percentage of female labour force participation (FLFP) and male labour force participation (MLFP) in 1990 was 57.2 percent and 84.7 percent respectively. This kept on decreasing, though slowly, to 55.3 percent and 81.7 percent respectively by the year 2014. In sub-Saharan Africa, female labour force participation increased from 60.2 percent in 1990 to 65.2
percent in 2014, however, for male labour force participation, there was a decrease from 80.7 percent to 77.3 percent within the same period. In North Africa, though with other Middle East countries, there was a wide gap between FLFP and MLFP. In 1990 MLFP was 79.2 percent as against 19.1 percent of FLFP. By the year 2014, MLFP was 78.2 percent as against 23.2 percent of FLFP. What is quite surprising is that in spite all programmes geared towards bridging the gender gap; For example, the Convention on the Elimination of all forms of Discrimination Against Women (CEDAW), which is one of the most widely ratified human right treaties in the world. CEDAW was adopted by the UN General Assembly in 1979 and full implementation in 1981 marked a significant milestone in the international struggle for women's right (Bond, 2014 citing Christine Chinkin, Thoughts on the UN (CEDAW)). Also, the Beijing conference of 1995 that calls for a 30 percent affirmative quota for women in the economy and Women Economic Empowerment (WEE). At the national level, we have country-specific legal provisions and policies such as New Labour Act in Ghana, Gender Policy and Gender Committee and promotion of women workers in Export Company in Kenya. Labour legislation extension to agricultural and domestic workers and the inclusion of domestic workers, who are predominantly women under the Unemployment Insurance Act covering employed workers in South Africa. This act necessitates employers to register their domestic workers and pay a monthly levy to a Fund. The Fund covers maternity, unemployment, death, and sickness (Chen, 2008). Yet, there seem to be no or little improvement in female involvement in the economy between the period of 1990 and 2014.

Perhaps, the attention of all these programmes was mainly on female involvement in politics, sustainability, and empowerment with fewer cognizances to female economy involvement. On the other hand, while the percentage of female labour force participation in Africa remains low relative to male, without a substantial increase between these periods, there may be some institutional factors that could influence female involvement in the economy.

Efforts made to improve female labour participation both at international level, for example, the Convention on the Elimination of all forms of Discrimination Against Women (CEDAW) and measures at country-specific level seem sabotaged by African religious and cultural ideologies coupled with poor and inconsistent policy implementation. Though in recent times there has been global awareness through legislation and laws on the importance of women in families, communities and its multiplier effects in the economy, yet little or no effect have been seen on pulling female into the labour force. Another female labour force participation's impeding factors include age, marital status, ages and number of children, fertility and so on.

This study is important at this point in time due to the changing nature of the global economy which requires a better understanding of women participation in labour force. This can be seen through the growth of the world manufacturing sector and the shift to developing countries. Hence, this study will contribute to existing body of knowledge by selecting countries across all the five African regions (Northern, Central, Southern, Eastern and Western Africa) to analyse the supply-side determinants of female labour force participation in Africa as against the use of data from sub-Saharan countries and Middle East and North Africa.
(MENA) countries as a proxy for Africa in some studies (Robinson, 2005; Verme, 2015). This may not depict the country-specific characteristics of female labour force participation in African countries and also it is not an adequate representation of Africa (because of the inclusion of Middle East Countries).

This paper aims to specifically analyse the trend of female labour force participation in selected African countries and also investigates the push and pull supply determinants of female labour force participation rate in Africa.

The rest of this paper is organised as follows: section one presents a general overview of the study, highlighting the problem being addressed. Section two reviews the conceptual, theoretical and empirical studies of female labour supply in selected African countries. Section three discusses the methodological issue with the classical labour supply adopted to build the model. While section four presents and discusses the result. Section five presents the summary, conclusion and policy recommendation

2.0 LITERATURE REVIEW

2.1 Theoretical Review

The Classical theory of labour postulates that the amount of national income and employment depend on the aggregate production function, the supply and demand for labour. With a fixed capital stock and a given constant technology, the output would increase only when employment of labour increases, that is, labour employment and output move in the same direction. Therefore, based on the classical theory, with fixed capital stock, as the employment of labour increases the marginal productivity of labour would diminish. This is the famous law of diminishing return of classical economics. However, the supply of labour by households in the economy relies on household's pattern of preference between leisure and income. The classical theory assumes that in the short run when the population does not vary, the supply curve of labour slopes upward. The classical economists believe that the substitution effect is higher than the income effect of the rise in real wage and consequently the supply of labour rises with the increase in the wage rate. This can be written thus;

\[ N_s = f\left(\frac{w}{p}\right) \]

This implies that at a higher wage rate, more labour would be supplied and vice-versa. Other modern theories of labour that addresses women labour supply emerged in the 1960s. These include Work-Leisure Choice Theory by Mincer’s (1962), which states that the decision to enter the labour market by an individual or household is the desire for more income. Another variance of the model known as “Household Production Theory” by Mincer’s (1962) explains that families are both producers and consumers of goods. Families thrive to efficiently allocate their time, income and the collection of goods and services they both use and produce, in an effort to maximise utility. This theory was extended by Gary Becker in 1965 with a theory called “Time Allocation Theory”. The theory of time allocation relies on the power of patriarch as the decision maker who allocates labour time to each member of the household. Hence, the allocation of resources within a household is determined by the bargaining power of each household member.

2.2 Empirical review
Studies have been conducted on the determinants of female labour force participation across countries, both developed and developing economies. Lee and Chung (2008) examined the interrelationship between fertility and female labour force participation in Korea for the period between 1980 and 2006. The study employed a comparative trend analysis. The finding showed that there is a negative relationship between female labour force participation and fertility rate. Implying that as the number increases, motherly responsibilities and caregiving will increase, which may hinder the possibility of women participation in economic activities outside the home. While in 2013, Aboohamidi and Chidmi examined the determinants of FLFP in Pakistan and some Middle East and North Africa countries (countries in consideration were Egypt, Morocco, and Turkey). The study used panel data analysis and discovered that the literacy rate and urbanization rate were a positive coefficient of FLFP. While fertility rate, and per capita income were negative coefficient. However, female education enrolment and trade openness had no significant effect on FLFP in the countries under study.

In Africa with the use of survey data, Ntuli (2007) examined the determinants of female labour force participation in South Africa, for the period of 10 years (1995 to 2004). The study used the decomposition technique. It was discovered that there exists a strong positive relationship between education and female labour force participation. It was revealed that education has been the prime factor determining female participation in South African workforce during the first decade of democracy (1995-2004) in South Africa. But an inverse relationship was found between female labour force participation and non-labour income, marriage, fertility and geographical variations in economic development. Notwithstanding, a perceived change in female participation in work force is due to emigration, and a change in human capital and financial endowment.

In Uganda, Magidu (2010) made it known through ‘t’ test statistics and logistics regression that female individuals face a lower relative probability to participate in the formal sector than their male counterpart. It was also discovered unmarried female individuals tend to be engaged in the formal sector than informal sector activities. Lower education level and age are found to be related to female individuals in the informal sector and higher education is related to that informal sector. Location (either urban or rural) determines female labour force participation in formal sector indicating that an individual faces a high relative probability to participate in the formal sector if he or she resides in urban and it reduces as an individual move to rural. The study used the Uganda national service delivery survey of 2008.

In a study conducted in Ghana by Baah-Boateng, Nketiah-Amposah, and Frempong (2013). They investigated on the effect of fertility and education on female labour force participation in Ghana while applying logistic regression and established that women with basic and tertiary education have a greater tendency of participation compare with those with no education. It was, however, revealed that as the number of children increases the participation of women increases, that is, women with more children have a higher likelihood of participation. This contradicts the finding of Sackey (2005) who used Ghana living standard surveys and discovered a negative relationship between female labour force participation and fertility.
Also, in Nigeria, using household survey employment data and logistics regression model, Iweagu, Yuni, Chukwudi and Andenyangtso (2015) discovered a positive impact of marital status, poverty rate and per capita income on female labour force participation in rural sector of Nigeria while a negative relationship was found with religion as against the findings of Adeyemi, Odujina and Akintoye (2016), which discovered a positive relationship. Moreover, Forgha and Mbella (2016) investigated the determinants of FLFP in Cameroon and its influence on economic growth for 37 years. A GMM technique was used and it was observed that dependency ratio, fertility rate, male labour force and per capita income are a significant determinant of FLFP in Cameroon.

Some of the notable methodological processes used are logistic regression, ordinary least square, maximum likelihood estimation technique e.t.c. However, only a few studies exist on the determinants of FLFP across countries in Africa. Existing studies are done on country basis while some made used of data for Sub-Saharan countries and the Middle East and North Africa (MENA) countries as a proxy for Africa. This may not depict the country-specific characteristics of female labour force participation in African countries and also it is not an adequate representation of Africa (because of the inclusion of Middle East Countries).

3.0 METHODOLOGY

In order to investigate the supply determinants of female labour in selected African countries, this study adopted the classical theory of labour supply with little modification. The study used panel data covering the periods between 1990 and 2015. In the context of this study, the real wage rate may not be a good determinant of women working outside the home according to the classical, however, factors such as female education, fertility which coincides with the most productive stage of women lifecycle and availability of child care facilities are closely related to female decisions to be economically active outside home. Others are the need to complement or meet the financial needs of the family (which may arise as a result of spouse’s unemployment) and family average income proxied by GDP per capita.

The model is specified thus:

$$s^{\text{FLFP}}_{i,t} = \beta_0 + \beta_1 MU_{i,t} + \beta_2 GDP/p_{i,t} + \beta_3 EDU_{i,t} + \beta_4 FER_{i,t} + \varepsilon_{i,t} \tag{1}$$

Where: $s^{\text{FLFP}}$ – Supply of female labour force participation; $MU$ – Male Unemployment; $GDP/p$ – Gross Domestic Product per capita; $EDU$ – Female Secondary Education; $FER$ – Fertility (Birth per Woman); $\varepsilon_{i,t}$ – Error Term; $i=$ Countries; $t=$ 1990-2015

This study used panel co-integration techniques having tested for the stationarity of the variables involved. This study used mean group estimator, dynamic fixed effect and pooled mean group estimator to investigate the supply determinants of female labour in selected African countries.

The data used for this study is a panel data for a set of 20 countries from the five regions in Africa (Eastern Africa, Western Africa, Central Africa, Southern Africa, and Northern Africa), as depicted in table 3.1. Data were drawn from the World Bank Data Bank. Countries were selected from each region based on the following criteria (i) country with the highest gender ratio of the labour force participation rates in each region (ii) country with the lowest gender ratio of the
labour force participation rate in each region (iii) country closed to the average gender ratio of labour force participation for each region (iv) country with the highest population in each region provided it has not been chosen under other criteria, totaling 20 countries in all. The choice of these countries was guided by the Population Reference Bureau (2015); and for the highest population in each region was retrieved from the United Nations, World Population Prospect (2015). This is depicted in table 3.1

**Table 3.1: Criteria on the Choice of Countries across Regions**

<table>
<thead>
<tr>
<th>Regions</th>
<th>Highest gender ratio of LFPR</th>
<th>Lowest gender ratio of LFPR</th>
<th>Closest to the middle of the gender ratio of LFPR</th>
<th>Highest population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern Africa</td>
<td>Sudan</td>
<td>Algeria</td>
<td>Egypt</td>
<td>Morocco</td>
</tr>
<tr>
<td>Western Africa</td>
<td>Togo</td>
<td>Mauritania</td>
<td>Nigeria</td>
<td>Ghana</td>
</tr>
<tr>
<td>Eastern Africa</td>
<td>Malawi</td>
<td>Comoros</td>
<td>Chad</td>
<td>Zimbabwe</td>
</tr>
<tr>
<td>Middle/Central Africa</td>
<td>Democratic republic of Congo</td>
<td>Chad</td>
<td>Equatorial Guinea</td>
<td>Angola</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>Botswana</td>
<td>Swaziland</td>
<td>South Africa</td>
<td>Namibia</td>
</tr>
</tbody>
</table>


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 labor force participation rate over the male rate. 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. A ratio of less than one indicates that the male labor force participation rate is greater than the female rate while a ratio of more than one indicates that the female rate is greater than the male rate.

In Africa, this was higher for Sudan, Togo, Malawi, the Democratic Republic of Congo, Botswana, and lowest for Algeria, Mauritania, Comoros, Chad, and Swaziland. While Egypt, Nigeria, Zimbabwe, Equatorial Guinea, and South Africa are in the middle of the gender ratio of labour force participation rate. Moreover, with the use of United Nations World Population Prospect (2015) ranking, Morocco, Ghana, Ethiopia, Angola, and Namibia were chosen as the countries with the highest population in Africa, having chosen other countries under other criteria.

Countries used for this study are; Algeria, Sudan, Egypt, Morocco, Mauritania, Togo, Nigeria, Ghana, Comoros, Malawi, Zimbabwe, Ethiopia, Chad, Democratic Republic of Congo, Equatorial Guinea, Angola, Swaziland, Botswana, South Africa, and Namibia. Due to limited data availability across these countries, this study covered the period covering 1990 to 2015.

**4.0 DATA ANALYSIS AND INTERPRETATION**

**4.1 Trend and Development of Female Labour Force Supply in the selected African Countries**

The time series plot in figure 4.1 shows the trend and development of female labour supply in selected African countries.
The graphs reveal that the supply of female labour in Nigeria, Togo, Mauritania, Comoros, Algeria, Botswana, Swaziland, and Algeria exhibit the same trend pattern as they all maintain an upward trend from 1990 to 2015, while Democratic Republic of Congo and Chad exhibit a downward trend. The downward trend in female labour supply in Democratic Republic of Congo can be linked to the effect of mining on women and a long period of conflicts. Women in this country are largely relegated to lower paying support roles such as mineral transport and food service. They are uniquely vulnerable to sexual exploitation and transactional sex in exchange for a job in the mining sector coupled with lack of adequate education on rights and limited social support (World Economic Forum, 2015)

Figure 4.1: Trend Analysis of Female Labour Supply in the selected African Countries

![Graphs showing trend analysis of female labour supply in selected African countries.](image-url)
supply with about 81.1 percent of the total female population of the same age group (15 and above). The high supply of female labour force participation in Togo is attributed to labour legislation on women particularly working mothers. In Togo, labour code provides 14 weeks maternity leave which can be extended by an additional 3 weeks in case of complication or sickness resulting from pregnancy and childbirth. This is followed by 6 weeks of postnatal leave with full pay. Also, customary divisions of labour do not hold in Togo, though men do most heavy construction work. Women perform almost all other manual labour in towns, villages, though less machine work and control small market commerce. This is the same for Malawi in Eastern Africa, whose ministries have developed gender response indicators targets and demand sectoral gender budget allocation in order to improve female labour supply (Danish Trade Union Council, 2014).

Botswana has the highest female labour supply in Southern Africa and this can be linked to the initial rural development effort that provided basic infrastructure in the whole country transformed Botswana from a primarily rural-based population to an urban resident population (Moepeng, 2013). This makes the current labour market no longer meant for agriculture alone but consists of aggregate household labour demand and supply decisions propel the upsurge in female labour supply.

Although Comorian women have a comfortable social status and a degree of material autonomy, yet they are limited by cultural norms which are embedded in the Arabian culture, hence the least female labour supply in East Africa. Factors influencing female labour supply in this region includes unfavourable socio-cultural aspects that limit gender equality and that are rooted in gender relations in marriage, family and community life (Africa Development Bank, 2009). Also, it is difficult for Comorian women to maintain work and house chores equilibrium because of their comfortable social status and maternal autonomy. However, high level of discrimination against women and the influence of religious norm and cultural values which affect female decision to work outside the home are responsible for the least female labour supply in Mauritania, Algeria, Swaziland, and Angola.

4.2 Result of Panel Unit Root Tests

The result of the stationary tests conducted on all the data by means of heterogeneous panel unit root test (Im, Pesaran, and Shin (IPS) and Augmented-dickey fuller test) and homogenous panel unit root test (Levin, Lin, and Chin) are presented in table 4.1. A time series is stated as non-stationary if the mean and variance of the time series are dependent over time (Gujarati, 2004). On the other hand, a time series is stationary if the mean and variance are constant over time.

However, most economic time series are non-stationary and only attain stationary at the first difference level or at a higher level. It is quite important to determine the order of integration before embarking on panel co-integration test. This is as a result of the fact that a non-stationary series contains unit roots and such series has the tendency of sustaining shocks.

In table 4.3, the panel unit root test for supply of female labour force participation (SFLFP) and Female Education (EDU) are stationary at first difference.
Table 4.1: Panel Unit Test

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IPS</td>
<td>ADF-Fisher</td>
<td></td>
</tr>
<tr>
<td>SFLFP</td>
<td>-4.807</td>
<td>100.791</td>
<td>0.000*** -4.115</td>
</tr>
<tr>
<td>MU</td>
<td>-3.417</td>
<td>75.292</td>
<td>0.000*** -3.142</td>
</tr>
<tr>
<td>EDU</td>
<td>-19.971</td>
<td>330.644</td>
<td>0.000*** -16.210</td>
</tr>
<tr>
<td>FER</td>
<td>-8.789</td>
<td>555.405</td>
<td>0.000*** -9.835</td>
</tr>
<tr>
<td>GDP/p</td>
<td>-12.232</td>
<td>211.259</td>
<td>0.000*** -12.2</td>
</tr>
</tbody>
</table>

Source: Author's Computation (2017)
Note: *** indicate significance @ 1%

The stationary status of the variables in both models thus suggests that the Mean Group (MG) /Pooled Mean Group (PMG) and Dynamic Fixed Effect Autoregressive Distributed Lag (ARDL) can be employed or used to analyse the supply of female labour force participation. Hence, the ARDL procedure of MG, PMG, and DFE is adopted for the study.

The results of pooled ordinary least square estimation, (PE), fixed effect estimation (FE) and random effect (RE) are presented in table 4.2. The result of the Hausman test allowed for the selection of the fixed effect regression model. Since fixed effect regression is selected, in order to solve the heteroscedasticity problem, the robust fixed effect within regression is conducted while the standard error was adjusted for 20 clusters in the country.

The pooled OLS estimation (PE), fixed effect (FE) and random effect are presented in table 4.4. The result of the Hausman test allowed for the selection of the fixed effect regression model. Since fixed effect regression is selected, in order to solve the heteroskedasticity problem, the robust fixed effect within regression is conducted while the standard error was adjusted for 20 clusters in the country.

Table 4.2: Static Analysis of Supply of Female Labour Force Participation

<table>
<thead>
<tr>
<th></th>
<th>PE</th>
<th>FE</th>
<th>RE</th>
<th>Robust FE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SFLFP</td>
<td>0.0507</td>
<td>0.305</td>
<td>0.062</td>
<td>0.207</td>
</tr>
<tr>
<td>Mu</td>
<td>-0.0077</td>
<td>0.552</td>
<td>-0.008</td>
<td>0.544</td>
</tr>
<tr>
<td>Gdpp</td>
<td>0.1116</td>
<td>0.021**</td>
<td>0.119</td>
<td>0.014**</td>
</tr>
<tr>
<td>Edu</td>
<td>-2.3089</td>
<td>0.000***</td>
<td>-2.331</td>
<td>0.000***</td>
</tr>
<tr>
<td>Constant</td>
<td>55.8341</td>
<td>0.000</td>
<td>57.512</td>
<td>0.000</td>
</tr>
<tr>
<td>Sigma-u</td>
<td>20.627</td>
<td>24.210</td>
<td>20.627</td>
<td>24.210</td>
</tr>
<tr>
<td>Sigma-e</td>
<td>2.473</td>
<td>2.473</td>
<td>2.472</td>
<td>2.473</td>
</tr>
<tr>
<td>Rho</td>
<td>0.986</td>
<td>0.990</td>
<td>0.986</td>
<td>0.990</td>
</tr>
</tbody>
</table>

Wald chi2(6)= 152.38, Prob > chi2 = 0.0000; R-square: Within = 0.24, Between =0.22, overall = 0.17

Source: Author’s Computation (2017)
Note: ***, **, * indicate significance @ 1%, 5% and 10% respectively
The result of robust fixed effect regression showed a significant negative relationship between fertility and the supply of female labour; such that, a unit increase in female fertility decrease the supply of female labour by 2.331. However, male unemployment, GDP per capita and female education have an insignificant impact on supply of female labour force participation in selected African countries during the period under study.

Similarly, the number of observations is relatively lesser than the number of years. This study adopted also the Mean Group, Pooled Group, and the Dynamic Fixed Effect to explore the dynamic nature of the variables that determine the supply of female labour.

For comparison, Table 4.3 presents the regression results of MG and PMG estimation for the supply of female labour participation. The constraint of the common long-run coefficient from MG yielded higher standard errors (see appendices) and speed of adjustment. This is expected since MG is less restrictive, and thus potentially inefficient. In testing the hypothesis of slope homogeneity, we use Hausman (1978) test. The P-values of the Hausman test for PMG and MG is greater than 0.05 (0.9096) and hence does not reject the long run homogeneity restriction hypothesis. Thus, preference is given to Pooled Mean Group estimator as this is found to be consistent and efficient under long-run slope homogeneity.

Table 4.3: Mean Group and Pooled Mean Group Estimation Results of supply of Female Labour

<table>
<thead>
<tr>
<th></th>
<th>MG</th>
<th></th>
<th>PMG</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LR</td>
<td>SR</td>
<td>LR</td>
<td>SR</td>
</tr>
<tr>
<td></td>
<td>Coef.</td>
<td>p-value</td>
<td>Coef.</td>
<td>p-value</td>
</tr>
<tr>
<td>Sflfp</td>
<td>Coef.</td>
<td>p-value</td>
<td>Coef.</td>
<td>p-value</td>
</tr>
<tr>
<td>Mu</td>
<td>-6.1943</td>
<td>0.268</td>
<td>-0.2825</td>
<td>0.007***</td>
</tr>
<tr>
<td>Gdpp</td>
<td>1.9680</td>
<td>0.424</td>
<td>0.2561</td>
<td>0.000***</td>
</tr>
<tr>
<td>Edu</td>
<td>12.4121</td>
<td>0.298</td>
<td>0.2851</td>
<td>0.000***</td>
</tr>
<tr>
<td>Fer</td>
<td>87.537</td>
<td>0.279</td>
<td>3.5225</td>
<td>0.000***</td>
</tr>
<tr>
<td>ECT</td>
<td>-0.2006</td>
<td>0.000***</td>
<td>-0.0559</td>
<td>0.073*</td>
</tr>
<tr>
<td>D1.mu</td>
<td>-0.1078</td>
<td>0.359</td>
<td>-0.0713</td>
<td>0.702</td>
</tr>
<tr>
<td>D1.gdpp</td>
<td>-0.0213</td>
<td>0.138</td>
<td>0.0058</td>
<td>0.704</td>
</tr>
<tr>
<td>D1.edu</td>
<td>0.0129</td>
<td>0.903</td>
<td>0.0943</td>
<td>0.361</td>
</tr>
<tr>
<td>D1.fer</td>
<td>0.8780</td>
<td>0.788</td>
<td>4.0707</td>
<td>0.100</td>
</tr>
<tr>
<td>Constant</td>
<td>3.8287</td>
<td>0.557</td>
<td>1.3249</td>
<td>0.129</td>
</tr>
</tbody>
</table>

Hausman test: $\beta_{mg} = \beta_{pmg}$

Failed to reject $H_0$ (0.9096)

Source: Author’s Computation (2017)  Note: ***, **, * indicate significance @ 1%, 5% and 10% respectively
In table 4.4, the Pooled Mean Group (PMG) estimator is also compared with Dynamic Fixed Effect (DFE) estimator, and Hausman test is applied to test the difference. The P-values of the Hausman test for PMG and DFE is lesser than 0.05 (0.0344), this shows the rejection of the null hypothesis. And hence, preference is given to pooled mean group estimator as the efficient estimator.

Table 4.4: Pooled Mean Group and Dynamic Fixed Effect Estimation Results of supply Female Labour

<table>
<thead>
<tr>
<th></th>
<th>PMG</th>
<th></th>
<th>DFE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LR</td>
<td>SR</td>
<td>LR</td>
<td>SR</td>
</tr>
<tr>
<td>Sflfp</td>
<td>Coef.</td>
<td>p-value</td>
<td>Coef.</td>
<td>p-value</td>
</tr>
<tr>
<td>Mu</td>
<td>-0.2825</td>
<td>0.007***</td>
<td>0.1122</td>
<td>0.584</td>
</tr>
<tr>
<td>Gdpp</td>
<td>0.2561</td>
<td>0.000***</td>
<td>-0.1771</td>
<td>0.008***</td>
</tr>
<tr>
<td>Edu</td>
<td>0.2851</td>
<td>0.000***</td>
<td>0.0066</td>
<td>0.973</td>
</tr>
<tr>
<td>Fer</td>
<td>3.5225</td>
<td>0.000***</td>
<td>-2.0848</td>
<td>0.036**</td>
</tr>
<tr>
<td>ECT</td>
<td>-0.0559</td>
<td>0.073*</td>
<td>-0.0776</td>
<td>0.000***</td>
</tr>
<tr>
<td>D1.mu</td>
<td>-0.0713</td>
<td>0.702</td>
<td>0.0125</td>
<td>0.575</td>
</tr>
<tr>
<td>D1.gdpp</td>
<td>0.0058</td>
<td>0.704</td>
<td>0.0044</td>
<td>0.265</td>
</tr>
<tr>
<td>D1.edu</td>
<td>0.0943</td>
<td>0.361</td>
<td>-0.0014</td>
<td>0.955</td>
</tr>
<tr>
<td>D1.fer</td>
<td>4.0707</td>
<td>0.100</td>
<td>1.7740</td>
<td>0.013</td>
</tr>
<tr>
<td>Constant</td>
<td>1.3249</td>
<td>0.129</td>
<td>5.0112</td>
<td>0.000</td>
</tr>
</tbody>
</table>

**Hausman test:** \( H_0: \beta_{pmg} = \beta_{dfe} \) 0.0344  
Failed to accept \( H_0 \)

*Source: Author's Computation (2017)*  
*Note: ***, **, * indicate significance @ 1%, 5% and 10% respectively*

Based on the findings from PMG estimator in selected African countries. First, the long run result shows that male unemployment (MU), household income (GDPP), female education (EDU) and fertility (FER) are all statistically significant in determining the supply of female labour participation in selected African countries. However, male unemployment, GDP per capita as a proxy for household income and fertility rate (FER) do not show predicted sign and are statistically significant at one (1) percent and five (5) percent level of significance respectively. The result shows that an increase in household income and/or fertility rate of women increases the supply of female labour. While a one unit increase in male unemployment decreases the supply of female labour, such that a one unit increases in either household income and/or fertility rate increases the female supply of labour by 0.25 units and 3.52 units respectively.
However, in the short run fertility rate was only found to be significant and with a predicted sign. The Error Correction Model (ECM) reveals that the error correction term is significant, and it shows a negative value for all variables. This confirms the co-integration relationship according to Engel and Granger (1987). In addition, the ECT incorporates the long run information and shows that any deviation from long-run expected values is adjusted by 5.6 percent annually.

5.0 DISCUSSION OF FINDINGS, CONCLUSION AND POLICY RECOMMENDATION

5.1 Discussion of Findings

The results obtained in this study are quite imperative and have far-reaching implications for empirical and policymaking. Male unemployment, household income, female education, and fertility are the determinants of female labour supply in the long run. Male unemployment was expected to be positively related to the female supply of labour but this was found to be negative. This implies that male unemployment has a discouraging-worker effect on female decision to work outside the home. This may reveal the high level of unemployment in the country and therefore explain the unwillingness of women to pursue formal employment. Women prefer to be engaged in informal employment as male unemployment increases, because the possibility of obtaining formal employment seems unlikely, coupled with unfavourable employment conditions.

Against the theoretical prediction of a negative relationship between the supply of female labour and household income, the study discovered a positive relationship between the supply of female labour and household income. The negative relationship between income and work as envisaged can be obvious among high-income groups or families. Intuitively, Africa is a low-income region, hence the positive relationship between household income and the supply of female. Implying that women in Africa tend to work more even as household income increases; probably because of low wage Africa. This conforms to the study of Hua (2014), while testing if the probability of a full-time housewife is positively related to family income, the study found that negative relationship between family income and supply of female labour is common among high-income family groups and positive relationship is found in low-income families. However, it contradicts the study done on Nigeria by Iweagu, Yuni, Chukwudi, and Andenyangtso (2015). The study discovered a positive relationship between family income (proxied by GDP per capita) and female labour participation in urban and rural Nigeria. Education as a positive determinant of female labour supply was found valid in selected African countries. Increase in female education increase the opportunity cost of not working, thus the more educated a female is, the more reason to look for a job. This corroborates the study of Sackey (2005) in Ghana and Das, Jain-Chandra, Kochhar and Kumar (2015) in India. These studies opined that female education at all levels exerts a significant positive impact on women labour supply. In contrast to the study of Alcaino (2009), a positive relationship was found between fertility and female labour participation, such that as fertility increases female labour supply increases. This may imply that women in Africa have learnt how to simultaneously work outside and rear children or as the number of children increases, the more the need to work and cater to these children.

5.2 Conclusion
Leaning on our research findings, the study concludes that what determines the supply determinants of female labour force participation in Africa were male unemployment, household income, fertility and female education are responsible for the low supply of female labour. The prevalence of poverty in the region contributed to male unemployment because a society that is poverty ridden lacks the impetus and institutional framework to optimally maximize its human resources, hence male unemployment. Male unemployment has a negative impact on female supply and low household income which makes female to work as family income improves depicts the nature of Africa economic well-being. This also explains the reason to work by a female as the number of children increase. Moreover, in the contemporary world like Africa as a female level of education improves, the higher the opportunity of getting a better job and the greater the opportunity cost of not working.

5.3 Policy Recommendation

Based on the conclusion of the study, the government in conjunction with non-governmental organizations should devise means of reducing unemployment, particularly for unemployed married men who are capable and looking for a job in the region since this discourages female labour into the labour force. Thus, measures to reduce male unemployment and improve labour market conditions will contribute to increasing female labour supply.

An initiative to support parenting such as child care facilities or family support policies and early childhood development should be launched in order to enable female to combine work with childcare responsibilities. This should be supported by incentives targeting income groups when making tax and welfare policies. In addition, increasing girls' level of education will help to improve the pay gap between male and female. Persuasion, advocacy, and awareness raising will often be required, in combination with stipends or other financial support to motivate families to send their daughters to school. This will ensure a long-term effect on the economy.

5.4 Suggestion for Further Studies

In suggesting for further studies, this study has centered on the supply determinants of female labour force participation in selected African countries. Further studies can examine some of the less tested supply determinants of female labour force participation, such as age, marital status, female unemployment, traditions, and religious factors.
REFERENCES


   a. Bank Development Bank Indicators Website.