

FEMALE LABOR FORCE PARTICIPATION IN SUB-SAHARAN AFRICA

Mamello A. Nchake¹ and Nthabiseng J. Koatsa

Department of Economics, National University of Lesotho

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Abstract

Although female labor force participation is an important macroeconomic phenomenon which indicates growth and development there is no consensus on the direction and magnitude of its determinants. This study contributes to the currently scanty literature on drivers of labor force participation of women in developing countries focusing on the Sub-Saharan Africa region. The findings show that female labor force participation tends to increase with the level of economic development, level of household expenditure, female education, and access to communication infrastructure while it declines with high unemployment rates and HIV prevalence among women. Policy and legal restrictions on gender equality in terms of economic opportunities at workplace and in credit markets are also major hindrances to female labour force participation. Given these findings, it is important for countries in the region to put more focus on implementation of policies and institutions that enhance women employment.

Key Words: Female Labour Force Participation, Labour market, Sub-Saharan Africa

JEL Codes: J16; J21; O55

¹ Carnegie scholar, School of Economics, University of Cape Town

1. Introduction

Female labor force participation (LFP) is an important driver (and outcome) of growth and development (Verick, 2014). Higher levels of female LFP are an indication of higher returns on human capital and education (World Bank, 2009). The participation of women in the labour force is more important in Africa where women are more active as economic agents than anywhere else in the world. Women contribute significantly in agricultural activities in Africa; they own third agricultural firms and mostly make up to about 70 percent of total employees (AfDB, 2015).

While women's labor force participation tends to increase with economic development, the relationship is not straightforward or consistent at the country level. Despite the notable growth in female labour force participation globally, there are still substantial gaps between men and women in the labour market. In 2015, it was estimated that only 50 percent of working age women (above 15 years) are in the labor market compared to 77 percent of men, with the least participation rate in Western Asia, Southern Asia, and Northern Africa (World Bank Indicators, 2016). In developing countries, the disparities across countries are more pronounced for women than for men despite the notable growth in the proportion of women in paid employment outside agriculture (Verick, 2014). This difference is driven by a wide variety of economic and social factors, which include economic growth, education, and social norms (Verick, 2014). However, the relationship between female labor force participation and these factors is both diverse and contentious.

In a traditional setting, the household, is considered to be the elementary decision unit, making consumption and labour supply decisions and household members maximize a unique utility function under a budget constraint. However, a major criticism of this assumption is that a household comprise of several adult members does not necessarily behave as a single rational agent. Gender theorists (for example Becker, 1965; Folbre, 1995) argue that the adult female members of the household are faced with a decision between paid work and unpaid household work that involves emotional care or 'caring labour'. Subsequent propositions (for example in Jaumotte, 2003) argue that work would be preferred if the opportunity cost working is lower or if the elasticity of female labor supply to wages is higher than that of home production.

A number of studies empirically analyse how various factors affect the women decision to participate in formal employment or unpaid household work. Some studies have used data from advanced countries (Jaumotte, 2003; 2009; 2011 & 2013) while others from developing countries (Verick, 2014). Some studies use data from a group of countries (Pissarides, 2003; Christiansen et. al., 2016a & 2016b) while other studies conduct country specific analysis (Gunatilaka, 2013; Rahman and Islam, 2013). A limitation of this literature, however, is that it mainly focuses on advanced regions. A few studies examine

drivers of female labour force participation in Africa (Casale, 2004, Sackey, 2005; Yakubu, 2010). But most of these studies use country-specific data and focus only on education as a driver of female LFP. An exception is the study by (Gronzales *et al.*, 2015) who analyse the effect of legal factors on female labour participation. However, the combine Sub-Saharan Africa with OECD countries which may hide some salient dynamics specific to Sub-Saharan Africa region.

In this study, we identify and analyse various determinants of female labor force participation, focusing on demographic, institutional and social factors specific to the Sub-Saharan African region. To our knowledge, there are no cross-country studies that analyse the impediments to female labour participation using cross-country data in the Sub-Saharan Africa region. This study is therefore important as it focuses on Sub-Saharan Africa, an area currently under-researched in this literature. Countries within this region share similar economic and social constraints that influence gender disparities across countries and this makes it possible to prescribe the general policy options to increase participation of women in the labour market.

The outcome of this study will inform policy makers and government institutions on the main factors that influence women participation in the labour market. This will enable formulation and implementation of policies that consider both supply and demand-side dimensions to enhance employment for women and reduce gender disparities in the labour market. The results will also enable policy makers to understand the nature of women's labour supply and how to improve access in order to take advantage of new labor market opportunities that arise as a country grows and, in so doing, contribute to the development process itself. This study will also underscore the effectiveness of policy, legal and institutional environment in ensuring the fulfilment of the Sustainable Development Goal on gender equality and the commitments under Africa's agenda 2063.

The remainder of the paper is structured as follows. The next section presents the overview on the context and trends in labour force participation in SSA. Section 3 reviews the existing literature on female labour force participation in Sub-Saharan Africa. Section 4 presents the methodology and econometric analysis of the data to identify the main drivers of female labour participation in the region. Section 5 provides a summary of findings and policy implications.

2. Background and trends on labour markets in Sub-Saharan Africa

2.1 Legal and institutional reforms on gender discriminations in selected African countries

Most African governments have made significant developments in the legal, regulatory and policy framework to enhance women participation in the formal labour markets (Gronzales *et al.*, 2015). These

efforts have resulted in positive effects on labour force participation in the past two decades (see table 2). For example, in Namibia, the “Married Persons Equality Act,” was enacted in 1996. This law equalized property rights for married women and granted women the right to sign a contract, head a household, pursue a profession, open a bank account, and initiate legal proceedings without the husband’s permission. As a result, Namibia experienced substantial increases in female labor force participation rates of 10 percentage points, in the following decade (Gronzales *et al.*, 2015). Malawi introduced similar laws invalidating customary law in 1994, combined with a nondiscrimination clause and equal inheritance rights for surviving spouses.

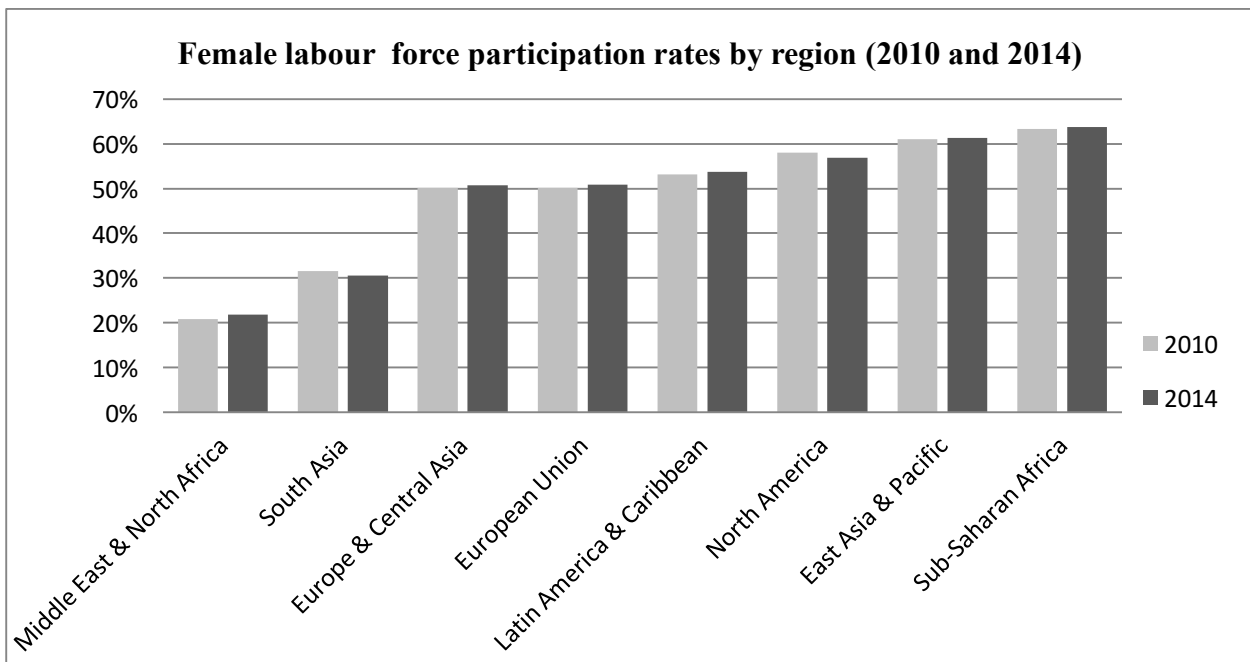
In 2006, Lesotho also approved the Legal Capacity of Married Persons Act 9 to enable women to own property, access financial and labour markets. This law came as a result of the country’s commitment to ratify all forms of discrimination against women under the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) in 1995 and the Protocol to the African Charter on Human and Peoples’ Rights on the Rights of Women in Africa in 2004 (AfDB, 2005). However, Lesotho still operates under a dual legal system whereby the common law (Roman Dutch law) and the customary law are both valid.

Kenya’s constitution prohibited gender discrimination from 1997. However customary law-traditional rules governing personal status and communal resources-was exempt from this nondiscrimination clause and prevailed in a number of areas, including inheritance and property rights afforded to women. The major reform which was implemented in 2010 involved amending customary law to rectify the non-discrimination and equal treatment clause in matters related to personal status, inheritance, and property rights of women and their representation in parliament.

The restrictions on women participation in economic activities (for example, to acquire permission from their husbands) was removed many other Sub-Saharan countries following the Convention in 1995. In South Africa, for example, the restrictions were removed in 1998 and in 2004 in Mozambique. However, there are still some countries in Sub-Saharan Africa (for example Lesotho, Ghana and Botswana) where customary law still restrict the full implementation of the constitutional clause on gender non-discrimination. The removal of such restriction could significantly reduce the gender gap which has remained unchanged over the past decade, as shown in figure 2 below.

2.2 Trends labour force distribution across regions

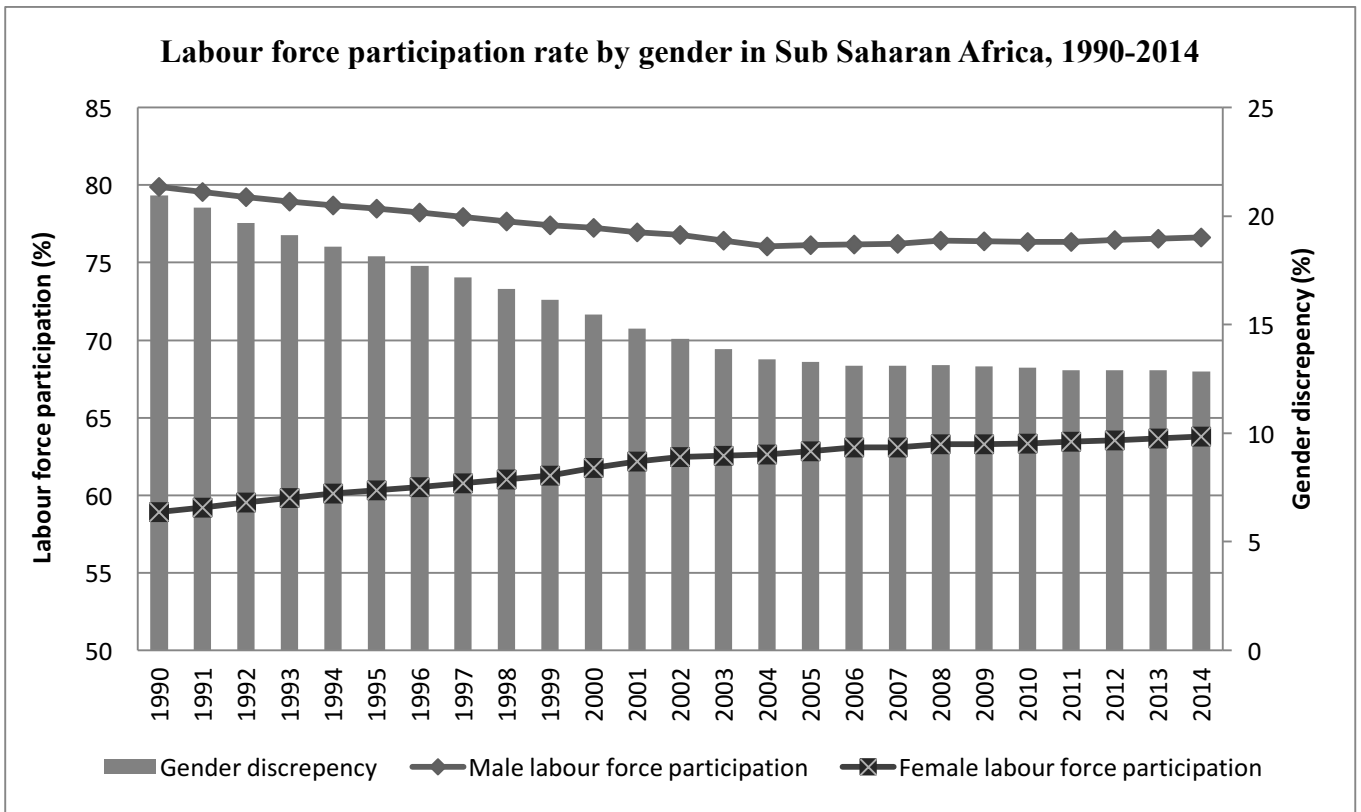
Although the global female labor force participation rate has remained stable over the past two decades across all regions, it has remained significantly higher in Sub-Saharan Africa at 63% in 2010 and 64% in 2014 compared to other regions (see Figure 1).



Notes: Data obtained from World Bank Indicators (2016). Female Labor force participation rate is defined as the proportion of the female population ages 15 and older that is economically active: all females who supply labor for the production of goods and services during a specified period (ILO).

Figure 1: Female labour force participation rate by region for 2010 and 2014

However, the data (see Figure 2) shows a wide gap between male and female labour force participation within the Sub-Saharan region between 1990 and 2014, with male participation significantly higher than female participation. Although male labour force participation has declined from 80% in 1990 to 76% in 2014, it was still significantly higher than female labour force participation (by 10%) by 2014. These discrepancies between female and male participation in the labour force points to large potential of increasing female labour participation within the region.



Notes: Data obtained from World Bank Indicators (2016). Labor force participation rate is defined as the proportion of the population aged 15 years and older that is economically active (ILO).

Figure 2: Annual labour force participation rate by gender in Sub Saharan Africa, 1990-2014.

Another interesting insight is that the non-decreasing gender gaps in the labour market over the past 10 years in the Sub-Saharan region. The data (see Figure 2) show that from 1990 to 2003, the gap between male and female participation declined from 21% to 14%. However, between 2004 and 2014, the discrepancies between males and females in the labour market remained at 13 percent. This could be attributable to a combination of cyclical and structural factors. In a case where the trends are attributable to the cyclical factors, as the economy recovers, there should be an improvement in the participation rates in the labour market. However, if the trends are due to structural factors such as legal and policy restrictions, then participation rates would improve through adoption of the appropriate policies and removal of the legal restrictions on gender disparities.

This questions the effectiveness of policies that have been introduced to reduce the gender discrepancies within the region. Hence this study investigates the key determinants of female labour participation in the Sub-Saharan participation.

3. Literature review on female labour force participation

Labour force participation is influenced by labour supply and labour demand factors. Recent theoretical developments have encompassed many demand and supply side factors in trying to explain the participation decision in the labour market. The starting point is the standard, neoclassical static labour supply model which suggests that an increase in the wage rate increases the supply of labour (Blundell and MaCurdy 1999). Two distinct effects emanate from the trade-off between labour supply and leisure as proposed by this model. The substitution effect between labour hours and leisure shows that higher wages increase the price of leisure, which is the opportunity cost of work, and hence reduces demand for it. On the other hand, the income effect emanates from the argument that an increase in the individual's or household's income will increase the demand for leisure and hence reduce labour supply. This implies that an individual labour supply already participating in the labour market will depend on the relative strengths of the income and substitution effects. In contrast, for a person who is not already engaged in work, an increase in the wage rate increases the incentive to work, and an increase in non-labour income or the incomes of other household members is a disincentive to enter the workforce. However, gender theorists argue that the trade-off between a female's decision to join the labour market involves choosing between paid work and unpaid household work that involves emotional care or 'caring labour' as described by Becker (1965) and Folbre (1995). Subsequent studies (for example, Jaumotte, 2003) also show that work would be preferred if the opportunity cost of working is lower or if the elasticity of female labor supply to wages is higher than that of home production.

A variety of factors contribute to the increase on both demand and supply sides (Pissarides *et al.*, 2003). The importance of the educational attainment is particularly underscored as it affects an individual's choice to participate in the labour market. Increased education improves female labour participation quantitatively and in terms of improved self-esteem and provides them with competitive work skills (Tansel, 2001; Ejaz, 2007; Angel-Urdinola and Haimovich, 2009).

However, the empirical literature provides inconclusive results on the effect of education on labour outcomes. The hypothesis is that higher returns to education increase participation of women in the labour market compared to men (Duraisamy, 2000; Sackey, 2005; Yakubu, 2010; Tymaz, 2009; Dayioglu and Kirdar, 2009). Studies from the developing countries has found a U-shaped relationship between educational attainment and female labour force participation whereby the most uneducated women participate in subsistence activities and informal employment (Verick, 2014) while poorly educated women (primary school level) join the labour force due to family compulsion and better-educated women (college graduate level) are encouraged by higher waged and competitive work skills (Das, 2006; Olsen

and Mehta, 2006; Klasen and Pieters, 2015). Another group of this research report a positive relationship (Bhalla and Kaur, 2011; Faridi, Malik and Basit, 2009; Hafeez and Ahmad, 2002) while other studies found a negative relationship between the two (Das and Desai, 2003; Dasgupta and Goldar, 2005; Kingdon and Unni, 1997; Kottis, 1990).

Another important driver of female labour force participation is the level of economic development. The relationship is explained in a U-shaped curve where the participation of women is high in poor countries and low in high income countries (Tsani et al., 2013). At the initial stages of development, most women work in family enterprises partly because of the increase in market opportunities for men and partly due to social barriers against women from entering the formal labour market. As the country develops, the work skills and capabilities also improve enabling more economically active women to participate in the paid labour market. However, female labour force participation can also be a driver of economic development. As more women enter the labour market, economies tend to grow (Verick, 2014).

There have also been changes on the labour demand side. One key driver is the social demographic dimension (such as fertility and birth rate) which can be complex and multi-dimensional as it also depends on social attitudes and lifestyle. The empirical literature is ambiguous on the effect of the demographic factors on female labour participation. While most country-specific studies have reported a negative association (for example, Bloom et al., 2009; Mishra and Smyth, 2010), the cross-country studies have found a positive relationship (for example, De Laat and Sevilla-Sanz, 2011). The social attitudes and life styles that have evolved towards child-bearing later in life contribute to declines in fertility rates (Goldstein et al., 2009; Lesthaeghe, 2010; and, OECD, 2011). Yet society's attitudes to women's work remain ambiguous, and the clash between family values and egalitarian perspectives are an obstacle to greater gender equality in the labour market (Fortin, 2005; and, Unnk et al., 2005). This suggests that cross-national differences in household composition, social differences and fertility behavior explain variations in female employment patterns (Desai and Jain, 1994; Anxo et al., 2007; De Hénau et al., 2007; Michaud and Tatsiramos, 2011 and; Thévenon, 2009).

Legal and institutional framework can also affect participation of women in the labour market. Supportive regulations and policies, such as gender-specific anti-discrimination laws, help working parents to cope with family responsibilities (Jaumotte, 2003; Misra et al., 2011 and; Blau and Kahn, 2013). Manning (1996), for example, found a positive impact on wages and employment for women due to the introduction of the Equal Pay Act of 1970 and the Sex Discrimination Act of 1975 while Blau and Kahn (1996) found that centralized wage-setting institutions greatly lower the gender pay gap in the United Kingdom. On the other hand, excessive regulations restrict supply and increase prices of services that support female participation in the labour market such as childcare. Pissarides et al., (2003), for example

found a strong negative effect of high administrative costs of setting up a business on female labour participation.

Policy initiatives such as availability of maternity leave can also encourage female labour participation. The literature have cited a non-linear relationship. Jaumotte (2003) for example, has shown that while properly designed maternity benefits can support participation of women in the labour market, it can also lead to reduction of skills and earnings if it is prolonged (Ruhm 1998; Edin and Gustavsson 2008). As parental leave is mostly taken by women, it can indirectly encourage employer discrimination and discourage employers from hiring women for positions that require costly qualification and training periods (Mandel and Semyonov 2005). This implies that policies that encourage greater parity between paternity and maternity leave could support a more rapid return to work among mothers and help change underlying gender norms (World Bank 2012a).

Against this background, it is apparent that gender disparities in the labour market are significant and yet persistent across countries owing to the impact of numerous factors. The literature shows that in developed countries, the elasticity of female labour supply in response to own wage changes appears to have declined significantly although it is hard to argue that this is the case in developing countries (Blau & Kahn 2003). However, research that seeks to understand the main sources of gender disparities in the labour market is scanty and inconclusive, particularly in Africa. To our best knowledge, no study has analysed the drivers of female labour force participation focusing only on Sub-Saharan African countries.

4. Methodology

4.1 The empirical model and estimation strategy

The empirical analysis in this draws from the framework used by Thévenon (2013) and Gonzales et al. (2015). The econometric analysis considers the determinants of the aggregate female labour force participation rates of economically active women of between 15-64 years old for a set of SSA countries. We capture the influence of specific economic and social characteristics through a simple specification that links labour force participation and its main determinants as depicted in the literature:

$$LFP_{it} = \alpha + \theta \cdot Demographics + \gamma \cdot Education + \delta \cdot Policy + \phi \cdot Legal + \rho \cdot X + \varepsilon_{it} \quad (1)$$

Where the dependent variable, *LFP* is female labour force participation rate for country *i* and year *t*. *Demographics* include fertility rate of a woman; *Education* is the total number of years of schooling of a woman aged 15-64; *Policy* represents policy efforts in each country that influence female labour force

participation such as maternity leave; *Legal* is the legal restrictions that influence female labour participation; *X* is a vector of controls that can affect labour market dynamics such as institutional framework, infrastructure, social attributes and economic factors. Finally, $\varepsilon_{i,t}$ is the two-way error component term; $\varepsilon_{i,t} = \sigma_i + \tau_t + \mu_{i,t}$ where σ_i is the unobserved individual country-specific effects. τ_t is unobserved time effect; and $\mu_{i,t}$ is the remaining part of the stochastic disturbance term. These fixed effects correct for the biases from estimating panel data (Baldwin and Taglioni, 2006).

Based on equation (1), three sets of analysis are considered to analyse the drivers of female labour force participation. The first specification considers the demographic factors, measure of development, labour market dynamics, infrastructure, institutions and social factors. This is given by equation (2):

$$LFP_{it} = \beta_0 + \beta_1 FE_{it} + \beta_2 BR_{it} + \beta_3 HE_{it} + \beta_4 UN_{it} + \beta_5 INFR_{it} + \beta_6 INST_{it} + \beta_7 HIV_{it} + \sigma_i + \tau_t + \mu_{it} \quad (2)$$

Where *FE* is average number of years on schooling by women in education; *BR* is birth rate (per 1000 population); *UN* is total unemployment rate as an indicator of labour market equilibrium²; *HE* is percentage growth in household final consumption expenditure; *INF* is an indicator of communication infrastructure such as subscription of mobile and fixed line telephones; *INST* is a measure of institutional framework designed to hinder/encourage women participation in the labour market; *Policy* is an indicator of policy programs aimed at improving female labour force participation such as maternity leaves nursing breaks for nursing mothers. Finally, *HIV* is a variable that captures any social attributes such as incidence of HIV among economically active female population.

The second model analyse female labour participation controlling for policy related factors in addition to the standard determinants on education, demographics and labour and dynamics. This is given by equation (3):

$$LFP_{it} = \beta_0 + \beta_1 FE_{it} + \beta_2 BR_{it} + \beta_3 HE_{it} + \beta_4 UN_{it} + \beta_5 INFR_{it} + \beta_6 INST_{it} + \beta_7 Policy_i + \sigma_i + \tau_t + \mu_{it} \quad (3)$$

Finally, when men and women are subject to different laws, they respond differently to economic market conditions. This study analyses whether these differences can explain female labor force participation. This is given by equation (4):

² **Total unemployment rate** is defined as unemployed workers as share of the labour force (working-age population), in %. Aggregate rates refer to the 15-64 age group (ILO database).

$$LFP_{it} = \beta_0 + \beta_1 FE_{it} + \beta_2 BR_{it} + \beta_3 HE_{it} + \beta_4 UN_{it} + \beta_5 INFR_{it} + \beta_6 INST_{it} + \beta_7 Legal_i + \sigma_i + \tau_t + \mu_{it} \quad (4)$$

To analyse equations (2), (3) and (4), we use the fixed effects approach, which assumes that labour market characteristics and policies are homogeneous across countries. The fixed effects model corrects for the biases from estimating panel data (Baldwin and Taglioni, 2006). For comparisons, the analysis considers three measures of female labour force participation i) the ratio of female to male labour force participation rates of prime-age population (15-64 years old). ii) the aggregate labour force participation for a full-time female worker and iii) the aggregate labour force participation for a part time female worker.

4.2 Data description

The dataset used in this study was accessed from the International Labour Organisation (ILO) database, Barro-Lee database, World Bank's Women, Business and the Law database and the various datasets from World Bank. The World Bank's Women, Business and the Law Database (WBL) in particular presents a number of indicators on legal restrictions and regulations relating to women's economic participation and entrepreneurship, including limitations related to accessing institutions, owning and managing property, getting a job (such as restrictions on women's work, including working at night or in certain industries), building credit, and going to court. The database provides detailed information on the manner in which laws and regulations have been used to establish differences on the basis of gender, generally to the disadvantage of women. For selected indicators, the database allows for tracking legal changes back to 1960, providing sufficient information to assess the economic effects of such restrictions. The data covers 37 Sub-Saharan African countries over the period 2005-2014. The selection of countries in the sample depends on the availability of the data.³

³ The detailed table of the variable description and the sources are in the appendix.

Table 1: Summary statistics of determinants of female labour force participation in SSA (2005-2014)

Variable	Median	Mean	Standard deviation	Min	Max	No. of Obs
Female labour force participation rate (age 15+)	67.6	65.5	15.6	25.3	90.5	370
Male labour force participation rate (age 15+)	79.9	78.9	8.1	61.9	91.8	370
Female average years of total schooling (age 15+) ⁴	3.8	4.5	2.4	0.8	9.6	62
Birth rate (per 1,000 people)	38.2	37.2	7.3	10.6	51.6	370
Number of children per woman ⁵	0.8	0.8	0.1	0.3	1.1	370
Household final consumption expenditure (% GDP)	0.7	0.7	0.3	0.3	2.3	342
Female unemployment rate	7.5	10.7	8.9	0.3	44.8	333
Male unemployment rate	6.6	8.7	7.2	0.8	33.2	333
Share of women's living with HIV (ages 15+)	58.7	57.0	7.0	19.8	69.1	340

Table 1 presents the summary statistics of the key variables used in the paper. The data show a significant variation particularly for the dependent variable where the maximum female labour force participation rate is 90%, the minimum rate, 25% and the mean is 65%. On the contrary, labour force participation rate for men across the Sub Saharan Africa is relatively higher with average of 79%, varying between 62 % and 92%. Another key determinant is the average female years of schooling which shows that on average women years of schooling is about 4 years with minimum 0.8 years and maximum 9.6 years. Our sample also shows that female unemployment is relatively higher (maximum is 45% and average is 11%) than male unemployment (maximum is 33% and average is 9%). One important variable in our sample is the percentage share of women aged 15 years and above who are living with HIV. The data shows that on average 57% of women is HIV positive with maximum of 69% and 19% minimum.

5 Empirical Results and Discussion

Table 2 presents the results based on specification (2).⁶ Column 1 presents the basic results of the neo-classical model where labour supply is only determined by years of schooling. The second column controls for demographics, labour market dynamics and family characteristics. The third column account for infrastructure while columns 4-5 account for intuitional factors and column 6, social factors.

⁴ The data is available at 5-year intervals.

⁵ See the Appendix for detailed explanation.

⁶ Since the number of time series observations (years) are significantly smaller than the number of cross-sectional observations (countries), we do not need to worry about time series estimation procedures such as stationarity, spurious regression and cointegration of the variables.

Table 2: Regression results on labour force participation and institutional framework (2005-2014)

Variables	(1)	(2)	(3)	(4)	(5)	(6)
<i>Average years in education</i>	0.226** (0.097)	0.260** (0.113)	0.279** (0.114)	0.289** (0.107)	0.273** (0.107)	0.316*** (0.067)
<i>Birth rate</i>		-0.226** (0.104)	-0.292*** (0.089)	-0.494*** (0.168)	-0.291*** (0.099)	-0.441*** (0.128)
<i>HH consumption expenditure</i>		0.008* (0.008)	0.014* (0.007)	0.020** (0.008)	0.016** (0.006)	0.003* (0.007)
<i>Unemployment rate</i>		-0.071*** (0.019)	-0.048*** (0.013)	-0.073*** (0.022)	-0.072*** (0.018)	-0.077*** (0.022)
<i>Infrastructure</i>			0.001** (0.000)			
Institutional Factors						
<i>Control of corruption</i>				-0.046* (0.022)		
<i>Government effectiveness</i>					-0.058* (0.032)	
Social factors						
<i>HIV prevalence among women (15+ age)</i>						-0.028*** (0.010)
<i>Constant</i>	3.407*** (0.207)	5.555*** (0.435)	4.289*** (0.399)	5.765*** (0.639)	5.169*** (0.432)	5.164*** (0.579)
<i>Year FE</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Country FE</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Observations</i>	64	48	46	47	48	46
<i>Adj. R-squared</i>	0.51	0.57	0.60	0.65	0.63	0.75

Notes: The dependent variable is computed at the year and country level. All regressions assume that there are common characteristics across time and across countries respectively. The corresponding standard errors are robust heteroskedasticity-consistent. *** p<0.01, ** p<0.05, * p<0.1

The results provide some interesting insights on the main determinants of female labour force participation in SSA. First, increases in female labor force participation is associated with increases with number of years a woman has spent in school. The results are consistent with those reported by other studies such as Steinberg and Nakane (2012). A step further is to test whether the relationship could be non-linear as it has been found in the literature but the results show no evidence of non-linear relationship with female labour force participation. Second, birth rate as an indicator of family size is negatively associated with female labour force participation.⁷ On the face of it, this suggests that women in larger families are prone to remain at home to take care of the family in the case of SSA. This also reflects the fact that the conflict

⁷ We also run the same results using the number of children per woman as an indicator of family size and the results do not significantly change.

between women's productive and reproductive roles increases the opportunity cost of having children. Third, as expected, an increase in household expenditure is associated with an increase in participation of women in the labor market. Forth, high unemployment negatively contributes to LFP of women. This is consistent with recent data which reflects a persistently high unemployment in (for example, ILO, 2016). Communication infrastructure as measured by the number of mobile and fixed line telephone subscribers increases LFP of women. This is in line with the fact that communication infrastructure enables access to information about the labour market. Although statistically insignificant, the contribution of birth rate and number children per woman on LFP is negative. Perception on corruption and government effectiveness show a negative association with female labour force participation. This implies that in SSA, fairness in implementation of employment policies is expected to reflect more male participation which is the case. However, the variable is insignificant.

An important insight from this study is the overwhelming adverse effects of the HIV pandemic to changes in the female labor supply in SSA. As the number of economically active women who are diagnosed with HIV increases, the contribution of women in the labour market declines.

Table 3: Regression results on labour force participation and policy framework (2005-2014)

Variables	(1)	(2)	(3)
<i>Average years in education</i>	0.260** (0.113)	0.260** (0.113)	0.260** (0.113)
<i>Birth rate</i>	-0.226** (0.104)	-0.226** (0.104)	-0.226** (0.104)
Policy Factors			
<i>Breaks for nursing mothers</i>	0.173** (0.077)		
Who Pays for maternity leave? ⁸			
<i>Government + Employer</i>		-0.217 (0.204)	
<i>Government (100%)</i>		-0.423*** (0.106)	
<i>Average days for maternity leave</i>			0.151** (0.098)
<i>Constant</i>	4.816*** (0.413)	4.989*** (0.442)	4.080*** (0.435)
<i>Year FE</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Country FE</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Observations</i>	48	48	48
<i>Adj. R-squared</i>	0.57	0.57	0.57

Notes: The dependent variable is computed at the year and country level. All regressions assume that there are common characteristics across time and across countries respectively. The corresponding standard errors are robust heteroskedasticity-consistent. *** p<0.01, ** p<0.05, * p<0.1

⁸ Baseline outcome is Employer

Table 3 presents the results on labour force participation, accounting for various policy determinants. Policies that are friendly to women such as maternity leave positively affects female labour force participation. Policies that protect nursing and pregnant women at workplace such as maternity benefits by employers and nursing breaks at work, also contribute positively to women participation in the formal labour markets.

Table 4: Regression results on labour force participation and legal framework (2005-2014)

Variables	(1)	(2)	(3)	(4)	(5)	(6)
<i>Average years in education</i>	0.261** (0.112)	0.260** (0.113)	0.260** (0.113)	0.260** (0.113)	0.260** (0.113)	0.260** (0.113)
<i>Birth rate</i>	-0.214* (0.108)	-0.226** (0.104)	-0.226** (0.104)	-0.226** (0.104)	-0.226** (0.104)	-0.226** (0.104)
Legal Factors						
<i>Gender clause in the constitution</i>	0.570*** (0.143)					
<i>No gender discrimination at workplace</i>		0.397*** (0.095)				
<i>No gender discrimination in occupation</i>			0.300*** (0.064)			
<i>No gender discrimination in credit markets</i>				-1.298*** (0.321)		
<i>Equal remuneration between men and women</i>					-0.907*** (0.172)	
<i>Law protecting women after maternity</i>						0.731*** (0.152)
<i>Constant</i>	4.941*** (0.459)	4.479*** (0.435)	4.689*** (0.451)	5.555*** (0.435)	4.989*** (0.442)	4.257*** (0.405)
<i>Year FE</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Country FE</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Observations</i>	46	48	48	48	48	48
<i>Adj. R-squared</i>	0.69	0.57	0.57	0.57	0.57	0.63

Notes: The dependent variable is computed at the year and country level. All regressions assume that there are common characteristics across time and across countries respectively. The corresponding standard errors are robust heteroskedasticity-consistent. *** p<0.01, ** p<0.05, * p<0.1

Legal restrictions are also important in influencing female labour force participation in SSA. In particular, as depicted by table 4, legal restrictions on gender discrimination in the workplace and in accessing credit show strong and significant negative association with female labor force participation in in the SSA region. On the positive side, an inclusion of the gender non-discrimination in the constitution reduce the restrictions on female labour force participation as the coefficient is positive and highly significant. Similarly laws that provide protection to child-bearing women even after maternity positively influence women to participate in the labour markets.

Robustness Checks

Further interrogation of the data is essential. First, there is need to test the robustness of the dependent variable by using alternative measures of female labour force participation. We use the percentage share of female to male labour force participation rate. This is the proportion of a country's working-age population (ages 15 and older) that engages in the labour market, either by working or actively looking for work, expressed as a percentage of the working-age population. The results presented in table 5 shows that the results presented in tables 2-4 are robust to use of a difference measure of female labour force participation. Improvement in female human capital remains positively associated to women participation in the labour market. Fertility of a woman is negatively associated to the decision of a woman to join the labour force. Institutional and legal restrictions also negatively relate to female labour force participation. Finally policies that support women at workplace positively influence women to increase their participation in the labour market and social issues such as HIV prevalence among economically active women remain a significant factor that negatively influence female labour force participation.

Table 5: Regression results on labour force participation and legal framework (2005-2014)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>Average years in education</i>	0.120** (0.044)	0.260** (0.128)	0.178*** (0.046)	0.173*** (0.044)	0.176*** (0.041)	0.260** (0.128)	0.260** (0.128)	0.345** (0.135)	0.164*** (0.049)	0.260** (0.128)	0.260** (0.128)	0.260** (0.128)
<i>Birth rate</i>		-0.226** (0.119)	-0.389** (0.140)	-0.353** (0.124)	-0.358** (0.127)	-0.226** (0.119)	-0.226** (0.119)	-0.368** (0.133)	-0.299** (0.117)	-0.226** (0.119)	-0.226** (0.119)	-0.226** (0.119)
Institutions												
<i>Perception on corruption</i>			-0.014* (0.023)									
<i>Government effectiveness</i>				-0.043* (0.035)								
Policy Factors												
<i>Breaks for nursing mothers</i>					0.173** (0.077)							
Who Pays for maternity leave? <i>Government + Employer</i>						-0.217 (0.204)						
<i>Government (100%)</i>						-0.423*** (0.106)						
<i>Average days for maternity leave</i>							0.151 (0.098)					
Social Factors												
<i>HIV prevalence among women (15+ age)</i>								-0.017** (0.006)				
Legal Factors												
<i>Gender clause in the constitution</i>									0.250*** (0.050)			
<i>No gender discrimination in occupation</i>										0.300*** (0.064)		
<i>No gender discrimination in credit markets</i>											-0.907*** (0.172)	
<i>Law protecting women after maternity</i>												0.731*** (0.152)
<i>Constant+Controls</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year FE</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Country FE</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Observations</i>	64	48	46	47	48	48	48	30	46	48	48	48
<i>Adj. R-squared</i>	0.34	0.57	0.67	0.65	0.60	0.57	0.57	0.69	0.59	0.57	0.57	0.57

Notes: The dependent variable is computed at the year and country level. All regressions assume that there are common characteristics across time and across countries respectively. Other controls include growth in household final consumption expenditure, infrastructure and unemployment rate. The corresponding standard errors are robust heteroskedasticity-consistent. *** p<0.01, ** p<0.05, * p<0.

6 Conclusion and Policy Implications

This study examines the main drivers of female labour force participation in the Sub-Saharan Africa region. The results reveal that female labor force participation in the region is positively driven by the level of economic development, level of household expenditure, female education, and access to communication infrastructure; while it is adversely driven by the unemployment rate and HIV prevalence among women. The number of children that a woman bears negatively affects their participation in the labour market. Finally, the rating of public sector on accountability, transparency and control of corruption are found to negatively drive female LFP, although not significantly. Policy and legal restrictions on gender equality in terms of economic opportunities workplace and in credit markets are also major hindrances to female labour force participation. The results are robust to use of alternative measure of female labour force participation.

Taken together, these results suggest policy and institutional frameworks that are in place to encourage participation of women in the labor force are not effective enough to counter the challenges facing SSA, such as, high unemployment and HIV prevalence especially among women. This result explains the recent trend in female LFP as indicated by the data and reinforces the need to put more effort and focus on eliminating economic, social and legal restrictions, reducing unemployment and curbing the HIV pandemic in SSA.

7 Further analysis

Further interrogation of the data will be considered. First, is additional robustness check of the dependent variable by using alternative measures of female labour force participation such as part-time employment and full-time employment of women. This is because during labour market transitions, some women may be forced to seek part time jobs while in some cases women choose to work part-time in order to allocate the remaining time to household responsibilities. Second, the results could be subjected to use of labour force participation rates of price age years as labour force participation decisions could also differ by age groups.

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Appendix

Definition of variables

Female education

Definition Female education represents the average years of education attained by females over age 15. The Barro-Lee (2014) dataset provides improved data disaggregated by sex and by five-year age intervals. It provides educational attainment data for 146 countries in five-year intervals from 1950 to 2010.

Source Barro and Lee (2014) Educational Attainment Dataset.

Demographic Variables

1. *Birth Rate*: Birth rate, crude (per 1,000 people)

2. *Number of Children per Woman*: Number of children (total population 0-14) per woman (total female population 15-64):

$$NC = \frac{\text{child population (total population 0 – 14)}}{\text{Total female population (female population 15 – 64)}}$$

World Bank Definition

Total fertility rate represents the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with current age-specific fertility rates.

Sources

OECD Database on Labour Force Statistics

World Development Indicators (Original source: United Nations)

Time Period

OECD and World Bank: 1960–2012

Institution Variables

Government Effectiveness (estimate): captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.

Control of Corruption (estimate): captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by

elites and private interests. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.

Source

World Bank Indicators

Time period

2000-2015

Social variables

HIV prevalence: Prevalence of HIV, total (% of population ages 15-49).

Policy Variables

1. *Maternity Leave*: number of weeks for which a pregnant woman is entitled to leave work before and after childbirth regardless of income support. Source OECD Family Database
2. *Breaks for nursing mothers*: Are nursing mothers entitled nursing breaks?
3. *Who pays for maternity leave?* This is a categorical variable with three alternatives; Employer (100%)=1, Government + Employer=2 and Government (100%)=3
4. *Average days for maternity leave*: What is the length of paid maternity leave?

Sources

Social Institutions and Gender Index (SIGI) regional Report for Sub-Saharan Africa.

World Development Indicators

Legal Variables

The 50 Years of Legal Rights Database tracks changes in women's right to access legal institutions and use property for 100 economies over a period of 50 years.

Variables

1. Can women work in the same occupations as men?
2. Can married woman open a bank account?
3. Is there a non-discrimination clause covering gender/sex in the constitution?
4. Are mothers guaranteed an equivalent position after maternity leave?
5. Can women do the same jobs as men?

Source

World Bank Women, Business and the Law Database. The database compiles information that examines the degree to which the legal ability of women to interact with public authorities and the private sector is different from that of men.

Time Period
1960–2010