Female participation to self-employment in WAEMU : The role of acces to cell phone and access internet

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Abstract

There is a growing consensus on female participation to self-employment. as the labor market is undergoing major changes due to the digitalization of employment. The study examines the role of the internet and mobile phones in female participation in labor markets between 1997 and 2023 in WAEMU. The study aims to fill gap in the literature, as most previous studies have focused on developed countries. First, two FGLS estimation models are estimated. However, the unit root test revealed the absence of a unit root, thus presuming the absence of a long-term relationship. However, we observed by the Hausman test that the effect is random so we used the FGLS to examine the effect of internet access and smartphone use on women's self-employment. FGLS estimates show that internet and mobile phone have a positive effect on women's participation in self-employment.

Keywords : Self-employment, Internet, Cell Phone, FGLS

1. Introduction

The participation of women in the WAEMU (West African Economic and Monetary Union) zone in self-employment or self-employment in the countries of this Sub-Saharan African region has grown significantly in recent years (GSMA,2023). Cell phones are transforming the region, with a record number of operators setting up shop in Côte d'Ivoire, Burkina Faso, Mali and Senegal. From two operators to more than 3 or 4 in some countries (GSMA,2021). This increase in the number of telecoms operators has enabled the various WAEMU countries to make this sector one of the most innovative in boosting other sectors such as health, education, finance and even agriculture. By offering innovative solutions for Internet access and service pricing. According to, GSMA "System for Mobile Communications", by 2022, 69% of adult women in West Africa will own a cell phone, and only 32% will use the mobile Internet. WAEMU is a region where gender inequalities are still present in the labor market. Women's entrepreneurship is seen as a means of reducing gender inequalities and empowering women. Traditionally, women's self-employment has been limited to informal sectors such as retail, agriculture, crafts and fishing (Amber & Chichaibelu, 2023). .

System for Mobile Communications' report on "The Mobile Economy in Sub-Saharan Africa 2023" also reveals that mobile technologies and services contribute over 8% of each country's regional GDP, representing an additional economic value of $170 billion for Sub-Saharan Africa as whole. The rise of teleworking thanks to the Internet has enabled many women to switch from informal to formal activities, while retaining their family responsibilities as married women and mothers in some cases (Asongu & Le Roux,2023). The increased adoption of mobile Internet in the West African Economic and Monetary Union has transformed lives and is associated with high levels of well-being. Cell phones, particularly smartphones, are helping to empower women, giving them access to information, services and life-enhancing opportunities. In essence, smartphones also have the potential to contribute significantly and positively to the protection of women's human rights and to enhance their empowerment. As part of GSMA "Connected Women" initiative, the survey revealed that between 65% and 82% of women using the mobile Internet in West Africa, because Internet had positive impact on their lives.

This development raises important questions about the effects of internet access and cell phones on female participation in the labor market and in the West African Economic and Monetary

Union , as well as the challenges that persist, despite their growing adoption. To address this dilemma, it is crucial to examine the role of the Internet and cell phones on women's self-employment in West Africa.

2. Literature review

Female participation in self-employment, particularly via the Internet, is rapidly evolving field. The rise of digital technologies and globalization have reorganized formal and informal work arrangements and offered new economic opportunities (Cieślik & stel,2024). In the face of this growth in the existing economic literature, we will explore the dynamics underlying women's engagement in online self-employment and the factors that influence their participation. The theoretical literature is dominated by evolutionary theory, endogenous growth theory and Schumpeterian theory. Romer (1990) endogenous growth theory is thus put to the test since the creation of a cluster requires investments in human capital; both public and technical capital. The use of the Internet and mobile phones generate jobs for women, generating profits after commercial activities. The digital divide between Female and Male, remains deep in many regions, particularly in South Asia and Africa, because of the costs and the digital skills required (Monareng & al,2024). This digital divide reinforces the marginalization of women and limits their ability to participate in increasingly digital economies. In addition, this lack of technical and digital skills can hinder their success in online employment, which requires expertise in areas such as programming, digital marketing (Ngwiligi & al,2024). Digital technologies play an important role in improving the inclusion of women in self-employment. Indeed, Matsuura-Kannari & Islam (2024) show in their work that governments should put in place strategies to improve access to the Internet, and promote digital education and training programs for women. These crucial initiatives can enable women to develop specific skills and successfully launch online careers.

3. Empirical Méthodologies & Data

3.1 Empirical Méthodologies

This study use a macro data to examine the effect of access to cell phone and access of internet on self-employment of female, creating a panel dataset for WAEMU. The panel dataset cover the period 1997–2023 for 7 countries for WAEMU. The study employs panel approaches to examine the effect of access to cell phone and access of internet on self-employment of female.

Since the individual country characteristics are likely to be non-random and may affect outcome variables, we need to control for them in our panel regression model. In such specification, the effects of the outcome will not influence those individual country fixed characteristics. The general specification of the fixed effect model is:

$$Y_{it} = \beta_0 + \beta_i Z_{it} + u_{it} \quad (1)$$

$$\text{With} \quad u_{it} = \mu_t + \varepsilon_{it} \quad (2)$$

$$\text{We are } Y_{it} = \beta_0 + \beta_i Z_{it} + \mu_t + \varepsilon_{it} \quad (3)$$

Where Y_{it} denotes the outcome variable for country i at time, Z_{it} is a vector of predictors (e.g : acces to cell phone, acces to internet,..) the parameters β_0 is an unknown intercept for each entity while β_i are the coefficient on each independent variables in the vector Z_{it}. Then, μ_t is the within country error term and ε_{it} is the over all error term.

Modèle 1 : Relationship between internet and Female participation to self-employment

$$Y_{it} = \beta_0 + \beta_1 cred_{it} + \beta_2 Internet_{it} + \beta_3 CO_{it} + \beta_4 Inf_{it} + \varepsilon_{it} \quad (4)$$

Where Y_{it} : Female participation to self-employment. It is pulled ILO(2024)

$cred$: Domestic credit to private sector. It is fired WDI(2024)

CO : Commercial Operning. It is calculated by the author.

Inf : Inflation. It is drawn WDI(2024)

Internet is fired IUT(2024)

Modèle 2 : Relationship between cell phone and Female participation to self-employment

$$Y_{it} = \beta_0 + \beta_1 cred_{it} + \beta_2 CP_{it} + \beta_3 CO_{it} + \beta_4 Inf_{it} + \varepsilon_{it} \quad (5)$$

Where Y_{it} : Female participation to self-employment. It is pulled ILO(2024)

$cred$: Domestic credit to private sector. It is fired WDI(2024)

CO : Commercial Operning. It is calculated by the author.

Inf : Inflation. It is drawn WDI(2024)

CP : Cell Phone is fired IUT(2024)

Table 1 : Diagnostic test of panel

	Model 1 (Internet)		Model 2 (cell phone)	
Test	F-stat	P-value	F-stat or chi2-prob	P-value
Homogeneity	F(4,178) = 27.42	0.0000	F(4,178) = 37.95	0.0000
Hausman	chi2(4) = 0.05	0.9997	chi2(4) = 0.47	0.9760
Heteroscedasticity	chi2(1) = 7.70	0.0055	chi2(1) = 4.71	0.0299
Autocorrelation	F(1,6) = 20.145	0.0000	F(1,6) = 20.008	0.0042

Source : Author based on ILO (2024), IUT (2024) & WDI (2024)

3.2 Data

3.2.1 Female participation to self-employment

Self-employed women are workers who are self-employed as own-account workers in an e-commerce business.

3.2.2 Domestic credit to private sector

Domestic credit to private sector refers to financial resources provided to the private sector by financial corporations, such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries these claims include credit to public enterprises (Ndjokou & Asoloko,2024). The financial corporations include monetary authorities and deposit money banks, as well as other financial corporations where data are available (including corporations that do not accept transferable deposits but do incur such liabilities as time and savings deposits).

3.3.3 Commercial opening

Commercial opening is measured by the commercial rate (sum of exports X and imports M divided by GDP), which is an absolute indicator of openness commonly identified as Trade

Share. Commercial Opening rates assess an economy's degree of commercial opening to foreign trade.

3.3.4 Internet

Internet is a worldwide computer network that makes services such as e-mail, publications, instant messaging and mail-sharing systems available to the public. Internet offers developing countries and emerging economies more opportunities to participate in the burgeoning digital economy (Alam & Zuma,2023). E-commerce on net should significantly promote economic growth and well-being in developing countries. The new export opportunities should in turn attract more foreign and domestic investment, there by stimulating growth.

3.3.5 Inflation

Inflation is a situation of widespread and sustained price rises for goods and services. This situation corresponds to drop in the purchasing power of money. In other words, with the same amount of money, you can buy fewer things than before (Aker &Mbiti,2010).

4. Results & Discussion

Tableau 1 : Result of estimation model 1 (access to cell phone) & model 2 (access phone mobile)

Dependent variable : Female participation to self-employment		
Independent variable	Model 1	Model 2
	FGLS regression	
Domestic credit to private	.1587*** (.0369)	.0854** (.0399)
Internet	.0403** (.0169)	-
Cell Phone	-	.0373*** (.0068)
Inflation	-.0150 (.0183)	-.0124 (.0181)
Commercial opening	-.0451** (.0209)	-.0397** (.0197

Constant	11.4641*** (1.2332)	10.9589*** (1.1692)
Prob > chi2 No. Of observation	0.000 189	0.000 189

Source : Author based on ILO (2024), IUT (2024) & WDI (2024)

Note : symbols (***) is prob <1%, (**) is prob <5% & (*) is prob < 10%

The results show that internet access has a significant positive effect on women's participation in self-employment, confirming that unlimited internet access can solve the employment problems of women, even those with the least computer skills. The credit offered to self-employed women has a positive and significant effect on women's participation in the labor market. This means that an increase in credit to these women leads to an increase in their participation in entrepreneurship. The degree of openness has a negative and significant effect on women's level of self-employment. This means that opening up the economy leads to a negative variation in women's participation in self-employment. In addition, inflation has a negative but insignificant effect on women's participation in self-employment. results show that, access to cell phone has a significant positive effect on women's participation in self-employment, confirming that access to smartphones can solve women's employment problems through online economic activities (Ndjokou & Asaloko,2024) .

5. Conclusion & Discussion

Internet use has a positive effect on female participation in labor markets, implies that a strict policy of free access to the Internet for women in developing countries improves their jobs, their standard of living and growth. An accommodative trade opening policy leads to a decline in women's participation in the labor market. This decline is essential because it proves the existence of free trade difficulties on female participation in self-employment in WAEMU. The reduction in women participating in work suggests that countries offer openness to countries that do not boost female employment (Bansal &Mahajan, 2020). In WAEMU countries, the private sector prefers to lend more to women to participate in self-employment with the Internet. This result is consistent with the findings of Baha & al. (2023).The use of mobile phones and the provision of credit have a positive effect on women's participation in labor markets, this implies that a policy of access to android phones by women with little credit allows women in WAEMU countries to self-employ through entrepreneurship. first of all improve the employment generated and increase the wealth as well as the standard of living and growth of

WAEMU. This increase is essential because it proves the importance of having smartphones and a little money one can create one's own business allowing to participate in the independent labor market in WAEMU. The private sector prefers to lend more to women to participate in self-employment with the internet. This result is consistent with the findings of Lu & al. (2023).

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List of countries in WAEMU

1- Benin
2- Burkina Faso
3- Côte d'Ivoire
4- Mali
5- Niger
6- Sénégal
7- Togo