

Sector-Specific Employment, Educational Attainment and Gender Inequality in the Economic Community of West African States (ECOWAS)

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Abstract

The gender gap in labour force participation and educational attainment remains a persistent challenge in the ECOWAS region, undermining social progress and the Sustainable Development Goals (SDGs), particularly SDG 5. Thus, we provide valuable insights into how the dynamics of female employment in the agriculture, industrial, and service sectors, as well as female school enrolment, contribute to reducing the gender inequality in ten selected countries (Benin, Burkina Faso, Ghana, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo) within the ECOWAS region. The panel datasets were obtained from the World Development Indicators of the World Bank and the United Nations Development Programme (UNDP) Human Development Report from 2005 to 2023. We employed pooled regression, fixed- and random-effects models, and the Hausman test, in conjunction with descriptive statistics, to analyse the datasets. Findings from the stylised facts for the aggregate sample indicated that the gender inequality index averaged 0.620, highlighting the pronounced discrimination faced by women and girls compared to men and boys across critical dimensions of human development, including employment, education, health, and political participation. The summary statistics for the disaggregated sample revealed that Nigeria is the least performing country in reducing the gender gap, showing an average gender inequality index of 0.676, which is greater than the regional average during 2005 - 2010. However, Senegal demonstrated an impressive performance in reducing gender inequality, with an average gender inequality index of 0.543 during the study period (2005-2023) and a decline from 0.546 in 2011 to 0.49 in 2023. More importantly, the random-effects findings indicated that female employment in agriculture significantly reduced gender inequality during the study period. This underscores the extensive involvement of women in agricultural activities and their contribution to the economic empowerment and financial independence of women in the ECOWAS region. Similarly, the random effects results indicated negative, significant impacts of female employment in industry and services on the gender parity index. The magnitude of this impact is greater than that of female employment in agriculture, suggesting that employment in industry and services offers women improved working conditions and status due to the associated higher and more stable income, alongside labour protections and social security benefits. However, the results further reveal that female primary school enrolment does not significantly reduce gender inequality during the student period. This underscores the inadequacy of primary education in mitigating structural inequalities, owing to limited economic empowerment and rising school dropout rates. Given the findings, we recommend that policymakers in the ECOWAS prioritise gender-sensitive employment and education by enhancing women's access to land and decent work, eliminating workplace discrimination, supporting female entrepreneurship, and promoting equal educational opportunities.

Keywords: Gender inequality, female employment, school enrolment, agriculture, industry, services and ECOWAS

JEL Classifications : I24, J16, J21, Q10.

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1. INTRODUCTION

The gender gap in labour force participation and educational attainment remains a persistent challenge in the ECOWAS region, undermining social progress, inclusive growth, and the achievement of the Sustainable

Development Goals (SDGs), particularly SDG 5. Essentially, SDG 5 emphasises the need to empower all women and girls to ensure gender equity and ultimately end all acts of discrimination against women, thereby highlighting the necessity to dismantle structural

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inequality through smart and targeted policies. As outlined in the extant literature, female empowerment through employment and education provides a sustainable roadmap for closing the gender and income gaps in developing economies, including Africa (see Adeosun & Owolabi, 2021; Adegun *et al.*, 2023; Idowu, 2023; Tokal *et al.*, 2023). In particular, female employment plays a critical role in reducing gender inequality by creating opportunities for women's economic empowerment, autonomy, and social participation. Heath *et al.*, (2024) and Molina & Tanaka (2023) describe female labour force participation as an important enabler of women's empowerment, improving financial autonomy and enabling better decision-making regarding education, health, and childbirth. This supports Duflo's (2012) assertion that when women earn their own income, it enhances their bargaining power within the household, including in decisions related to children's education, healthcare, and consumption. This enables fairer decision-making and transforms household dynamics from male-dominated choices to more balanced, equal arrangements. Employment is also highlighted as an engine of female empowerment for gender equality as it enhances women's access to financial services, property ownership, training opportunities, and social protection (see Soharwardi & Ahmad, 2020; Osabohien *et al.*, 2020; Danes, 1990).

In addition to employment, female education empowers women and reduces gender-based discrimination by addressing systemic disparities, creating positive multiplier effects for both households and society at large. Gender-based wage disparity decreases due to female secondary education [United Nations Educational, Scientific and Cultural Organisation (UNESCO), 2015]. According to Agu & Aguegboh (2021), access to education is a vital source of women's empowerment, as it enhances their potential for future development while diminishing the risk of falling into poverty traps. The World Bank (2017) report also underscores the role of female education in promoting the economic and political participation of women. This aligns with the Organisation for Economic Cooperation and Development (OECD, 2014) report, which identifies female education as a catalyst for increasing women's representation in parliaments and local governments across Africa. As a crucial investment in human capital, female education lays the foundation for reducing the gender gap by empowering women to actively and gainfully participate in economic, political, and social spheres.

Despite country and regional efforts towards reducing the gender gap in line with the SDGs and African Agenda 2063, the member countries of ECOWAS have continued to grapple with the issue of gender inequality. This is exacerbated by the sectoral structure of female employment in most countries, as they are disproportionately employed in the low-wage agricultural sector, which constrains the real gains in

gender parity. Although female employment in industrial and service sectors is believed to have high potential for reducing gender inequality in Africa, there is a lack of consensus among academics, researchers, policymakers and development partners on intended and desired economic and social gains, especially reduction in gender gap following high unemployment, discriminatory labour practices, socio-cultural constraints and low industrialisation, among others. Within this context, there is a growing literature examining how female employment across sectors and female education shape perceptions of gender inequality in West Africa. Among the many studies include Tokal *et al.*, (2023), Kim (2021), Apergis & Lynch (2022), Adeosun & Owolabi (2021), and Idowu (2023). However, we improved on these studies by expanding the sector-specific female employment across agriculture, industry and services while taking into consideration the role of female primary school enrolment in the selected ten member countries (Benin, Burkina Faso, Ghana, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo) of ECOWAS. Our choice of these variables primarily followed their a priori link to gender inequality and their relevance to SDG 4, SDG 5, and SDG 10. This is expected to deepen the understanding of gender and development in West Africa, while providing policy insights for a more equitable society.

2. DATA AND METHODOLOGY

2.1 Research Design

We employed an ex post facto research design, motivated by the use of secondary data in this study. According to Creswell & Creswell (2017), an ex post facto research design is ideal for regression analysis because it avoids data manipulation.

2.2 Data Description and Sources

The gender inequality index is used to measure gender inequality, and it describes a composite measure of gender-based disparities in a country as provided by the United Nations Development Programme (UNDP). Essentially, the gender inequality index covers three dimensions, including reproductive health, empowerment, and economic participation, which are normalised and aggregated into a single index that ranges from 0 to 1, with 0 denoting perfect gender equality and 1 indicating the highest gender inequality. On the other hand, sector-specific employment is measured by female employment in agriculture, industry and services as a percentage of female employment based on the International Labour Organisation (ILO) modelled estimate. Similarly, educational attainment is measured as the percentage of females enrolled in primary school relative to gross enrolment. The datasets were obtained from the World Development Indicators of the World Bank and the UNDP Human Development Report.

2.3 Model Specification

The model set up for this study closely followed the works of Tokal *et al.*, (2023) and Adeosun & Owolabi (2021), with some improvements following the inclusion of female employment across agriculture, industrial and service sectors. The formal specifications of the models are provided as follows:

i. Pooled regression model

$$GIIX_{it} = \beta_0 + \beta_1 FEAGR_{it} + \beta_2 FEIDS_{it} + \beta_3 FESER_{it} + \beta_4 FPSE_{it} + \varepsilon_{it} \quad (1)$$

Where: GIIX = Gender inequality index, FEAGR= Female employment in agriculture, FDE = female employment in industry, FESER = Female employment in services, FPSE = female primary school enrolment
 β_4 = slope parameters to be estimated, ε_{it} = error term, $i = 1, \dots, N$. $t = 1, \dots, T$, i = cross-sectional units including the ten selected countries in the ECOWAS region, t = time dimensions (2005 to 2023),

ii. Fixed Effects Model

$$GIIX_{it} = \beta_0 + \beta_1 FEAGR_{it} + \beta_2 FEIDS_{it} + \beta_3 FESER_{it} + \beta_4 FPSE_{it} + U_i + \varepsilon_{it} \quad (2)$$

Where: μ_i = Fixed effect (individual effect), ε_{it} = Error Term

iii. Random Effects Model

$$GIIX_{it} = \beta_0 + \beta_1 FEAGR_{it} + \beta_2 FEIDS_{it} + \beta_3 FESER_{it} + \beta_4 FPSE_{it} + U_i + v_{it} \quad (3)$$

Where: U_i = Random effects (individual effects), v_i = Remainder disturbance term

2.4 Estimation Strategy

We employed exploratory data analysis tools, including means, standard deviations, plots, scenario analyses, and basic inferential statistics, to discuss the stylised facts. However, the pooled regression model for the panel datasets was estimated using Ordinary Least Squares (OLS). This assumes that the intercept, along with the slope coefficients, will be homogeneous over time and across the ten selected countries. In contrast, the fixed effects model was estimated using the within-regression estimator, while the random effects model was estimated using the maximum likelihood (ML) estimator, following Balestra & Nerlove's (1966) proposition. However, the Hausman (1978) test was used to determine which of the two competing models was preferred.

3. FINDINGS AND DISCUSSION

Table 1: Summary statistics

Variable	Obs	Mean	Std. dev.	Min	Max
GIIX	190	.620	.051	.49	.724
FEAGR	190	40.255	20.446	.077	74.986
FEIDS	190	12.128	6.4722	1.537	24.886
FESER	190	47.297	17.744	12.989	89.412
FPSE	190	89.068	22.222	39.300	161.547

Source: Authors' computation from STATA 17

The summary statistics revealed that female employment in the services sector was the most prominent, averaging 47.297% throughout the study period. In comparison, employment in agriculture and industry averaged 40.25% and 12.13%, respectively. This trend underscores a significant structural transformation and evolving gender dynamics within the labour market in the ECOWAS region. The

disaggregated sample summary statistics revealed that Nigeria has the worst record in closing the gender gap, with an average gender inequality index of 0.676, above the regional average during the study period. However, Senegal showed an impressive performance in reducing gender inequality, with an average gender inequality index of 0.543 over the study period and a reduction from 0.546 in 2011 to 0.49 in 2023.

Table 3: Summary of the panel regression results

Dependent variable: GIIX	(1)	(2)	(3)
Variable	POLS	FE	RE
FEAGR	-.003 (0.139)	-.0167*** (0.000)	-.0081*** (0.000)
FEIDS	-.004** (0.032)	-.068** (0.000)	-.0086*** (0.000)
FESER	-.004** (0.037)	-.0107*** (0.000)	-.01006*** (0.000)
FPSE	-.00018*** (0.244)	-.0052*** (0.112)	-.00021* (0.092)
Constant	1.02*** (0.000)	1.55*** (0.000)	1.546*** (0.000)

Observations	190	190	190
R-squared	0.3406	0.32	0.485
F-test	23.89		
Prob.(F-stat.)	0.000		
Number of crossid		10	10
F-test(u _{i=0})		77.27	
Prob.>F-(u _{i=0})		0.0000	
Chi-square(var(u _{i=0}))			168.83
Prob.> chi2(var(u _{i=0}))			0.0000
Hausman test results	Chi2(4) = 1.11		Prob>chi2 = 0.8923

Source: STATA output (2024)

Note: *** p<0.01, ** p<0.05, * p<0.1 denote significant at 1%, 5% and 10% level respectively

Note: Figures in parentheses are the corresponding p-values of the coefficients

As observed from the Hausman test results, the probability value (0.892) of the Chi-square statistic (1.11) is greater than 0.05, indicating that the null hypothesis that the random effects result is appropriate cannot be rejected at the 5% significance level. The estimated random-effects model indicated that agricultural employment has a negative, significant effect on the gender inequality index. This implies that increasing female employment in agriculture is associated with reduced gender inequality. Similarly, employment in industry and services negatively and significantly affected the gender parity index. The magnitude of this impact is greater than that of female employment in agriculture, indicating that employment in manufacturing and services provides women with improved labour conditions and status, including higher and more stable wages, as well as labour protections and social security benefits. Additionally, we found that female primary school enrolment does not significantly reduce gender inequality. This suggests that although enrolling more females in primary school is important, it is not sufficient on its own to reduce gender inequality in the ECOWAS region.

4. CONCLUSION AND POLICY INSIGHTS

We conclude that increased female employment across agriculture, industry, and services significantly contributes to reducing gender inequality in the ECOWAS region. This highlights the importance of inclusive employment policies and gender-sensitive labour market reforms, which reduce structural bottlenecks and promote equitable access to economic opportunities for women. We also conclude from the findings that while increasing female primary school enrollment is ideal, it may be insufficient on its own to achieve the intended improvements in gender parity. This implies that policy interventions must extend beyond increasing enrolment rates at the primary level and also prioritise improved educational quality, completion, and progression to higher education levels. Overall, policymakers in the ECOWAS region must prioritise gender-sensitive employment and education by enhancing women's access to land and decent work, eliminating workplace discrimination, supporting female

entrepreneurship, and promoting equal educational opportunities.

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