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Effect of FDI Inflows on Employment Generation in Selected ECOWAS Countries: Heterogeneous Panel Analysis

Timothy A. Aderemi¹, Olawunmi Omitogun² and Bukonla G. Osisanwo³

The aim of this study is to examine the effect of FDI on employment in ECOWAS sub region between 1990 and 2019. The study utilizes a panel autoregressive distributed lag model to analyze the short run and long run relationship between FDI and employment across ECOWAS sub region. In the short run, the impact of FDI on employment is negative and statistically not significant. Meanwhile, in the long run FDI has a positive and statistically significant impact on employment rate. This implies that FDI has the capacity to generate employment in countries in ECOWAS sub region. Therefore, this study recommends that policymakers in the ECOWAS sub region should facilitate the achievement of productive, employment and decent work for all, policy measure that will facilitate the inflows of FDI should be embarked upon.

Keywords: FDI, employment, ECOWAS, Panel ARDL.

JEL Classification: F21, F23, F36, J21, J23.

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1. Introduction

The impact of FDI as a tool of employment creation in developing economies cannot be undermined. Over the years, FDI has been positively and significantly contributing towards economic growth and development through job opportunities and technological transfer in many developing nations. (Ucal, 2014; Mohammadvand & Ketabforoush, 2013; Tang & Tan, 2014; Mohammadreza & Arash 2014). Therefore, FDI is presumed to possess features that improve job opportunities that could stimulate regional economic development. Meanwhile, direct channels through which FDI impacts the host economy is sacrosanct because every investment in a new project requires the engagement of labour, which has a positive effect on local employment rates. Whereas indirect channels manifest via either spillover effects, crowding-out

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effects, or distributional effects. Firstly, the effects of technology and pecuniary spillovers may manifest in the form of improved efficiency in the production function of indigenous firms and later cause changes in demand of local labour. Furthermore, crowding out-effect in the labour markets could be experienced since new employment opportunities arise at the expense of job in already-established firms. Also, these processes could result in distributional effects in the form of a rise in wage dichotomy between skilled and unskilled workers. However, the conversation regarding the role FDI plays in employment generation remains inconclusive in the literature (Bogliaccini and Egan, 2017; Mohammadreza and Arash, 2014; Mohammadvand and Ketabforoush, 2013; Onimisi, 2014; Wei, 2013).

However, a consistent fall in the inflows of foreign aids to ECOWAS in the past decades has created an investment gap for employment enhancing projects. Thus, it is imperative for the policymakers to facilitate the alternative means of supplementing this gap, since most countries in West Africa experience low wage levels, high unemployment rates and strong reliance on the informal sector due to the problems of the investment gap (World Bank, 2020; United Nations Development Programme, 2019). Investment theories, such as capital movements theory by Mundell (1957), have argued that inflows of foreign capital such as FDI projects could bridge an investment gap, and consequently create a significant number of employments in an economy.

An attempt to provide empirical evidence to justify the above assertion has led to divergent opinions among the researchers over the time and space. Studies such as Vergara *et al.* (2015) and Saucedo *et al.* (2020) concluded that FDI inflows led to a rise in employment level in Mexico. Lee and Wie (2015), and Onaran (2012) reinforced the argument in Indonesia and Austria, respectively. In the same vein, Bogliaccini and Egan (2017) discovered a similar result in some developing economies. Some other studies such as Radosevic *et al.* (2003), Waldkirch *et al.* (2009), Villa (2010), Inekwe (2013) and Bandick and Karpaty (2011) provided evidence to support employment generating capacity of FDI in various sectors of the economy. On the contrary, Mucuk and Demirsel (2013) established contrasting results regarding FDI and employment generation in seven developing countries. Similarly, Habib

and Sarwar (2013) established that there is a positive long-run relationship between inward FDI and employment in Pakistan.

In the recent time, despite the fact that researchers have provided empirical evidence that support employment enhancing spillovers of FDI, it has been observed to the best of our knowledge, that the evidence is currently not sufficient for policy response in ECOWAS sub region. (See Folawewo and Adeboje, 2017; Mkombe *et al.* 2021). This creates a knowledge gap in the literature for this study to fill. In addition, in terms of methodology, the novelty of this study could also be attributed to the adoption of the panel ARDL technique in estimating the objective of this study in which no study has explored for the ECOWAS sub region and beyond in the most recent times. This technique provides efficient results when there is a long run homogeneity for the sample study. This study fills the identified vacuum by providing empirical evidence with regards to FDI and employment nexus in ECOWAS sub region for the period 1990 – 2019.

In view of the above, this study examines the long and short-run relationship between FDI and employment generation in ECOWAS sub region as its objective.

The rest of this paper is structured as follows: Section 2 contains literature review. While Section 3 comprises of data and methodology, Section 4 is results and discussion. Finally, Section 5 is the conclusion and policy implications.

2. Literature Review

2.1 Theoretical Literature

One of the important theories of FDI that shows a linkage between FDI inflows and employment is the Benign Model of FDI. The origin of this model could be traced to idea of Moran (1998). FDI is regarded as a capital tool which has the capacity to eliminate the vicious circle of poverty (VCP) enunciated by Ragnar (1953). Moran argued that the lack of capital in an economy is the major cause of poverty. This theory is related to earlier investment theories like Harrod-Domer Model (HMD), which conceptualizes investment as major factor that determines the level of savings and output. As such, a rise in capital leads to a rise in savings and output as well. A rise in the volume of investment stimulates an increment in national output. When

national output is expanded, it in turn leads to employment generation and reduction of poverty. It instructive to state that Benign Model is an offshoot of Prebisch (1951), which opines that FDI is a capital base package which is available for developing economies to access markets, technology and management skills, which could eventually orchestrate industrial development in these economies. However, Sackey *et al.* (2012) observed that the US economy grew rapidly in the 20th century due to the inflows of human and capital resources from many European economies, particularly Britain.

Furthermore, in bridging the saving gap in one hand and stimulating the capital base of developing economies, the Benign Model asserts that FDI is a strategic apparatus which could be utilized. Consequently, the supply side experiences increasing production, the demand for labour also rises on the demand side, this would eventually bring a rise in the wage rate and employment.

2.2 Empirical Review

Many studies have been carried out regarding FDI and employment nexus over time. In the light of the above, this section provides the summary of the existing studies with a view to identifying gaps. Dee *et al.* (2011) examined the employment implications of liberalizing FDI in OECD countries, the study reveals negative impact of FDI on employment due to factor endowment and market size among firms. Specifically, domestic sectors and firms in direct competition with FDI firms suffer, as sometimes labour is withdrawn from such sectors; for example, from the rural sector, as workers seek employment in agro-processing industries in urban areas. In another related study, Lee *et al.* (2011) estimated the effect of FDI on employment in Malaysia between 1970 and 2007 adopting ARDL model. The study showed that there is no long run relationship between employment and FDI in the country, however, there is a causal relationship running from FDI to employment. The study asserted that the significant factor generating employment growth in Malaysia. Chen (2012) employed generalized method of moments (GMM) technique to investigate the link between FDI and employment in China between 1991 and 2010. It was discovered that a direct relationship existed between FDI and employment. Atif *et al.* (2012) examined how FDI generated employment in Pakistan between the period of

1980 and 2010, and discovered that there was a significant positive impact of FDI on employment in the country.

Wei (2013) utilized regression analysis to examine how FDI and the level of employment were related in the Chinese economy between 1985 and 2011. The findings revealed that FDI has a negative but not significant impact on employment generation in the country. Employment in primary sector of the economy experienced a positive impact of FDI. While, the reverse was the case of secondary sector of the economy in spite the country's GDP having a significant impact on employment levels. FDI inflows and employment generation nexus was negative and significant in the tertiary sector of the economy. Mohammadv and Ketabforoush (2014) assessed how trade and FDI influenced job opportunities in thirteen 13 selected emerging economies between 2002 and 2010 with the application of panel data analysis. It was asserted that employment generation was significantly facilitated by FDI. Vijay (2013) examined how inventory of the government policy responses affected FDI and workers in Indiana automobile industries between 2001 and 2011. It was discovered that a direct linkage existed among turnover, FDI and set of workers engaging in production in the country.

Mohammadreza and Arash (2014) investigated the nexus between job creation and FDI in six economies of D8 group, namely Bangladesh, Egypt, Indonesia, Malaysia, Pakistan and Turkey between 2002 and 2010 using panel data. The findings established that FDI has a significant direct influence on employment. Gao *et al.* (2022) investigated how spillover effect of the outflows of FDI from China diffused to the productivity of German firms. The study opined that the negative spillover effect of Chinese FDI outflows was salient in Germany industries which possessed low productivities. Ayumu (2012) examined how FDI, workforce composition and domestic employment were related in Japanese economy between 2003 and 2005. Results of the study revealed that, firms that embraced FDI experienced higher employment growth in all three sectors than those which embraced only domestic investment. Enrico *et al.* (2014) examined relationship between inward FDI on regional employment in Europe using an unbalanced panel of 270 EU (sub-national) regions, seven manufacturing and services sectors, and three periods of time. The finding showed

that FDI inflows are employment expanding in all economic sectors, with the exception of the construction industry. Positive effects on employment are detected, on average, in Northern and Western EU regions, but not in Central, Eastern, and southern European regions.

Furthermore, Jorge and Richard (2018) utilized ARDL to verify whether FDI has enhanced growth in Spain between 1984 and 2010. The authors reported that no evidence for FDI to stimulate economic growth in this country. Massoud (2008) examined the nexus between employment and FDI inflows in Egypt from 1974 to 2005. This study focused on 24 sectors such as manufacturing, services, and agriculture. The study reported that aggregate FDI has no significant impact on demand for labour. Derek (2010) analyzed the relationship between FDI inflows, and employment generation in South Africa. The study submitted that FDI inflows, skill development, and employment generation has a direct relationship in the country.

Moreover, a study conducted by Tshepo (2014) estimate how FDI, job creation and economic growth are related between 1990 and 2013 in South Africa. The technique of Johansen Cointegration test was utilized. The author asserted that growth and employment level were stimulated by FDI. Saucedo *et al.* (2020) utilized Panel Corrected Standard Errors (PCSE) alongside Fixed Effects (FE) to estimate the linkage between FDI inflows, employment and wages accrued to low- and high-skilled workers in the real sector the Mexican economy between 2005 and 2018. The authors argued that a rise in inflows of FDI in the manufacture sector brought about direct influence on employment of low- and high-skilled workers. However, inconclusive findings were discovered in the service sector. Aderemi *et al.* (2019) employed Panel Cointegration alongside Pairwise Dumitrescu Hurlin Panel Causality Tests in assessing how FDI and economic growth were linked in seven emerging economies between 1990 and 2017. The study confirmed the existence of a long run convergence among the relevant variables of interest.

Poumie and Claude (2021) made use of the augmented mean group (AMG), dynamic ordinary least square (DOLS) and the common correlated effects means group (CCEMG) in analysing how foreign capitals such as FDI, migrant remittances influenced both the overall employment and sectoral job creation using 43 African

economies between 2002 and 2018. The outcomes of the study established that FDI and migrant remittances led to a direct influence on overall employment. But, it was only FDI that motivated both direct and significant influence job creation in industry, agriculture and service sectors the African economies.

Jude and Silaghi (2016) applied the fixed effects alongside GMM estimator in assessing the contribution of FDI to job creation in Central and Eastern European economies between 1995 and 2012. The authors argued that FDI was instrumental to the significant loss of employment in the countries under investigation.

Osabohien *et al.* (2020) assessed the level of the Nigerian employment due to FDI inflows from 1985 to 2017, using the Fully Modified Ordinary Least Squares (FMOLS). The authors submitted that FDI contributed a noticeable direct impact on the Nigerian level of employment.

In conclusion, from the reviewed studies, it could be established that despite the fact that impact of FDI have been significantly pronounced in this contemporary age, yet there exist few studies that have examined this effect on employment within West Africa sub region in the recent times. In addition, it is instructive to point out that FDI and employment generation are ongoing issues in developing countries.

3. Data and Methodology

3.1 Data

This study used an ex-post facto research design because the main aim of this work is to explore and describe the relationship between FDI inflows and employment generation in the ECOWAS sub region. In the same vein, this study utilized annual data from 1990 to 2019 mainly from the United Nations Conference on Trade and Development (UNCTAD), International Labour Organization (ILO) and World Development Indicators (WDIs) databases in analyzing the objective of the study. The study made use of data from Cote d'Ivoire, Ghana, Nigeria and Senegal. It is important to stress that the choice of the period is exclusively motivated by the availability of data. Similarly, the selection of the four countries was based on the fact that they dominate the West African economy accounting for over 90 per cent of the sub regional GDP (AfDB, 2018). In the same vein, these four countries received over 70

per cent of FDI inflows into the ECOWAS sub region in the recent times (UNCTAD, 2018).

Table 1: Data Description and Measurement

Abbreviation	Description	Unit of Measurement	Source
FDI	FDI net inflows are the sum of equity capital, reinvested earnings, and long- and short-term capital, that is, the value of inward direct investment made by non-resident investors in the reporting economy. FDI inflows as a percentage of GDP is used in this study	Percentage	United Nations Conference on Trade and Development
EMP	Employment is the ratio of country's total annual employment to labour force.	Percentage	International Labour Organization
GCF	Gross fixed capital formation which is the outlays or additions to the fixed assets of the economy plus net changes in the level of inventories, and gross capital formation relative to GDP was used.	Percentage	WDI database
PGR	Population growth rate	Percentage	WDI database
TOP	Trade openness, which is computed as the addition of imports and exports as percentage of GDP.	Percentage	WDI database
RGDP	Real Gross Domestic Product.	Billion dollars	WDI database
INF	Inflation rate	Percentage	WDI database
EXCH	Exchange rate	Dollars	WDI database

3.2 Theoretical Framework

In anchoring this study on a theoretical framework, the authors employed a simple model of labor demand with the extension of FDI in order to account for the influence of foreign capital on the labor market as enunciated in the theoretical literature regarding the nexus between employment and international trade (Greenaway *et al.*, 1999; Stehrer, 2004). The labour demand function in profit-maximizing firms for the country *i* at time *t* could be conceptualised as the total factor productivity as the function of foreign capital such as FDI. Therefore, the Cobb-Douglas production function

of the firms is as follows;

$$Y_{it} = A^\gamma K_{it}^\alpha L_{it}^\beta \quad (1)$$

where Y , A , K and L denote the real output, technological progress, the capital stock, and labour, respectively. In the same vein, α and β represent the elasticity of output with respect to capital and labour simultaneously. However, the coefficient γ represents the production process change that arises as a result of improvement in efficiency of factors (Greenaway *et al.*, 1999). Since the major aim of firms is profit maximisation, this indicates that the firms utilize factor inputs in such a way that their marginal revenue is equal to their price. Similarly, the wage equals the labor marginal revenue and the cost of capital is equal capital marginal revenue. Consequently, the capital stock is eliminated from the first equation in order to overcome problem that could arise while estimating its aggregate level and the interest rate is not adequately used as a proxy for the cost of capital.

$$Y_{it} = A^\gamma \left(\frac{\alpha}{\beta} N_{it} \frac{w_{it}}{c_{it}} \right)^\alpha L_{it}^\beta \quad (2)$$

N captures the level of employment, and if double logarithms of equation 2 is taken, it metamorphosed to equation 3 which is the labor demand of country i at time t .

$$\ln L_{it} = \theta_0 + \theta_1 \ln Y_{it} + \theta_2 \ln \frac{w_{it}}{c_{it}} \quad (3)$$

where

$$\theta_0 = -\frac{\gamma \ln A + \alpha \ln \alpha - \alpha \ln \beta}{\alpha + \beta}$$

$$\theta_2 = -\frac{\alpha}{\alpha + \beta}$$

$$\theta_1 = \frac{1}{\alpha + \beta}$$

Furthermore, foreign capital such as FDI has been submitted to influence technical efficiency parameter (Borensztein *et al.*, 1998). As such, this present study follows

Poumie and Claude (2021) and Greenaway *et al.* (1999) by adapting equation 3 with the elimination of variables that are not relevant to this study.

3.3 Model Specification

In extending the theoretical framework to capture the objective, the estimated empirical model in this study draws an insight from the generic labor market demand equation (3) as utilized in Poumie and Claude (2021) with the functional equation of the relationship between FDI inflows and employment generation as this;

$$EMP = f(FDI) \quad (4)$$

Following, Hanson (2001) and Saucedo *et al.* (2020), introduction of the following control variables as shown equation 5 becomes very important because they have either direct or indirect effects on employment generation.

$$EMP = f(FDI, GCF, TOP, GDP, INF, PGR, EXCH) \quad (5)$$

Writing equation (5) in econometrics form, gives equation (6). Then, the variables GDP and EXCH were logged because their measurements are not in percentage like the rest of the variables.

$$EMP = \beta_0 + \beta_1 FDI + \beta_2 GCF + \beta_3 TOP + \beta_4 LGDP + \beta_5 INF + \beta_6 PGR + \beta_7 LEXCH + u \quad (6)$$

If equation (6) is transformed into a dynamic panel model, equation (7) is emerged as follows;

$$\begin{aligned} EMP_{it} = & \sum_{i=1}^{p1} \Omega_1 EMP_{it-j} + \sum_{j=1}^{p2} \Omega_2 FDI_{it} + \sum_{k=1}^{p3} \Omega_3 GCF_{it} + \sum_{i=1}^{p1} \Omega_4 TOP_{it} + \sum_{j=1}^{p2} \Omega_5 LGDP_{it} \\ & + \sum_{k=1}^{p3} \Omega_6 INF_{it} + \sum_{i=1}^{p1} \Omega_7 PGR_{it} + \sum_{j=1}^{p2} \Omega_8 LEXCH_{it} + \theta ECM_{it-1} + \sum_{i=1}^{p1} \Omega_{11} \Delta EMP_{it-j} \\ & + \sum_{j=1}^{p2} \Omega_{21} \Delta FDI_{it} + \sum_{k=1}^{p3} \Omega_{31} \Delta GCF_{it} + \sum_{i=1}^{p1} \Omega_{41} \Delta TOP_{it} + \sum_{j=1}^{p2} \Omega_{51} \Delta LGDP_{it} + \sum_{k=1}^{p3} \Omega_{61} \Delta INF_{it} \\ & + \sum_{i=1}^{p1} \Omega_{71} \Delta PGR_{it} + \sum_{j=1}^{p2} \Omega_{81} \Delta LEXCH_{it} + u_{it} \quad (7) \end{aligned}$$

It could be inferred from the above that the employed variables in the model were mixture of I (0) and I (1) variables. Hence, the adoption of a Panel ARDL model. According to Pesaran *et al.* (2001), Pesaran and Pesaran (1997) and Pesaran *et al.*, (1999), if the variables of interest in a study are combination of I(1) and I(0), ARDL is the best approach.

Meanwhile, the aprori expectation is as follows: except for $\beta_6 < 0$, β_1 to $\beta_7 > 0$. It should be noted that Ω_1 to Ω_8 represent short run parameters and Ω_{11} to Ω_{81} represent long run parameters respectively. And θ is the speed of adjustment towards long run equilibrium. p is lag length. $i = 1, \dots, 4$ and $t = 1990, \dots, 2019$. u represents stochastic error term.

3.4 Estimation Procedure

This study made use of panel unit root test, Johansen fisher panel and the panel ARDL model to achieve the set objectives. Firstly, we employed the panel unit root test to determine the stationarity or otherwise of the series, and later tested for a cointegration test via Johansen fisher panel to establish whether a co-integration relationship exists among the studied variables. Consequently, the Panel ARDL model was estimated to analyse the short run, the long run and the adjustment to long run equilibrium.

4. Results and Discussion

4.1 Pre-estimation Results

In Table 2, the descriptive statistics are presented. The table gives crucial information regarding the behavior of the series employed for the model estimation. In the four selected ECOWAS countries, the FDI inflows as percentage of GDP, has a maximum and minimum values are 16.3% and -1.32%, respectively, with an average value of 2.9%. This shows that FDI inflows in relation with GDP in the ECOWAS sub region is low. However, FDI data is largely dispersed from its mean since the mean value of the variable is less than its standard deviation. Employment rate has a maximum and minimum values of 71.5% and 42.6% respectively, with a mean value of 57.3%. This shows that human resources have not been optimally engaged in ECOWAS sub region in the past 3 decades. Similarly, Capital accumulation as percentage of GDP has a minimum and maximum values of 53% and 8.2% respectively, with average

value of 21.3%. This data is moderately dispersed from its mean since its mean value is greater than its standard deviation.

Table 2: Descriptive Statistics

	FDI	EMP	GCF	TOP	PGR	LGDP	INF	LEXCH
Mean	2.912	57.343	21.311	61.763	2.609	70.978	10.950	0.540
Median	1.882	57.745	22.915	61.065	2.550	19.418	7.275	-0.693
Maximum	16.258	71.450	53.122	116.050	3.607	546.676	72.840	5.752
Minimum	-1.320	42.580	8.2530	20.720	2.085	4.908	-2.250	-3.411
Std. Deviation	3.124	8.1760	8.6198	20.220	0.300	125.983	13.628	2.419
Skewness	2.142	-0.132	1.014	0.198	1.306	2.425	2.208	0.966
Kurtosis	7.838	2.014	4.779	2.599	5.427	7.626	8.512	2.603
Jarque-Bera	205.309	5.121	35.788	1.563	62.528	220.892	245.303	19.153
Probability	0.000	0.077	0.000	0.458	0.000	0.000	0.000	0.000
Sum	343.682	6766.690	2514.733	7288.140	307.862	8375.438	1292.160	63.737
Sum Sq. Dev.	1142.096	7821.205	8693.345	47837.40	10.537	1856995	21728.13	684.845
Observations	120	120	120	120	120	120	120	120

GCF = Capital accumulation measured as % of GDP, FDI = Foreign direct investment as % GDP, EMP= Employment rate in %, INF = Inflation rate in %, TOP = Trade openness in %, LGDP= Gross Domestic Product in log form.

In the same vein, Trade Openness (TOP) has a maximum value of 116% and a minimum value of 20% respectively. It has a mean value of 61.7%, this implies that the ECOWAS sub-region is fairly integrated with the rest of the world. The standard deviation of TOP is less than the mean value, this implies that the data is moderately dispersed from its mean value. Population growth rate (PGR) has a maximum value of 3.6% and a minimum value of 2.1%. The mean value of PGR is 2.6%, this implies that the population growth is rising in ECOWAS countries. The standard deviation of the variable is less than the mean value. This suggests that the data is moderately dispersed from its mean. GDP in its log form has its maximum value of 546.7 billion dollars and a minimum value of 4.9 billion dollars. It has a mean value of 70.9 billion dollars which it is less than its standard deviation. This indicates that the data is largely dispersed from its mean. However, inflation rate has a maximum value of 72.8% and a minimum value of -2.3% respectively. The average inflation rate is

10.9%, this implies that ECOWAS sub region has a moderate inflation rate. The data is largely dispersed from its mean because of its standard deviation which is greater than the mean value.

Furthermore, all the variables are positively skewed except employment rate which is negatively skewed. In addition, the kurtosis values show that TOP, EMP and LEXCH are mesokurtic, whereas other variables are platykurtic in nature. It could be drawn from Table 1 that the dataset is largely normally distribution.

Table 3: Correlation Matrix

	LGDP	FDI	GCF	INF	PGR	TOP	LEXCH
LGDP	1.000						
FDI	-0.035	1.000					
GCF	0.085	-0.178	1.000				
INF	0.009	-0.022	0.370	1.000			
PGR	-0.178	0.011	-0.182	-0.057	1.000		
TOP	-0.573	0.299	-0.382	-0.148	-0.253	1.000	
LEXCH	0.886	-0.121	0.319	0.186	-0.154	-0.590	1.000

Note: GCF = Capital accumulation measured as % of GDP, FDI = Foreign direct investment as % GDP. EMP= Employment rate. INF = Inflation rate in %, TOP = Trade openness in %, LGDP= Gross Domestic Product in log form. LEXCH is the log of exchange rate. PGR= population growth rate

Table 3 shows the estimated results of various pairs of correlation analyses between the variables of interest. The degrees of correlations between various pairs of the explanatory variables such as LGDP and FDI is -0.035, GCF and FDI is -0.178, GCF and INF is 0.370, PGR and INF is -0.057, LEXCH and TOP is -0.590. It is should be stressed that these pairs of correlation analyses were not too high to result into multicollinearity in the subsequent models estimated. This assertion is justified by the submission of Goldberger (1991), which posited that simple correlation between a pair of regressors could cause the danger of multicollinearity in models if it exceeds 0.9.

Spurious regression is always an aftermath effect of time series data with a unit root. To overcome this problem the study employed the standard Levin, Lin & Chu t^* test, Im, Pesaran and Shin W-stat test, panel ADF test and Panel PP test. The results in Table 4 revealed that FDI, EMP and LRGDP were nonstationary at level but became

stationary after first differencing. This implies that these variables possess a unit root problem. Meanwhile, other variables such as PGR, TOP, GCF and INF were stationary at level. In another words, these variables were free from unit root problem.

Consequently, the variables in the models are a mixture of $I(0)$ and $I(1)$. Hence, utilizing Panel ARDL model as a technique of estimation became inevitable (Pesaran, Shin and Smith, 2001; Pesaran and Pesaran, 1997 Pesaran *et al.*, 1999). Whereas, optimal lag length selection were carried out and the all information criteria pointed to lag one as the optimal.

Table 4: Panel ADF Test and Panel PP Test

Variables	Level	Probability	1 st Diff	Probability	Remark
Panel ADF Test					
FDI	12.785	0.119	50.159	0.000	I(1)
EMP	2.686	0.953	20.203	0.009	I(1)
LEXCH	10.530	0.229	43.784	0.000	I(1)
GCF	16.398	0.037	-	-	I(0)
TOP	15.125	0.057	-	-	I(0)
LRGDP	0.339	1.000	29.269	0.000	I(1)
PGR	73.941	0.000	-	-	I(0)
INF	24.292	0.002	-	-	I(0)
Panel PP Test					
FDI	13.6737	0.091	94.967	0.000	I(1)
EMP	1.401	0.994	39.536	0.000	I(1)
LEXCH	11.172	0.192	60.802	0.000	I(1)
GCF	15.438	0.051	-	-	I(0)
TOP	16.547	0.035	-	-	I(0)
RGDP	0.171	1.000	48.581	0.000	I(1)
PGR	5.827	0.667	-	-	I(0)
INF	31.986	0.001	-	-	I(0)
Levin, Lin & Chu t* Test					
FDI	-0.562	0.2871	-4.845	0.000	I(1)
EMP	-0.866	0.1933	-2.110	0.017	I(1)
LEXCH	-2.419	0.0078	-	-	I(0)
GCF	-1.588	0.0561	-	-	I(0)
TOP	-1.174	0.0121	-	-	I(0)
RGDP	3.180	0.999	-2.594	0.005	I(1)
PGR	-9.904	0.000	-	-	I(0)
INF	-2.655	0.004	-	-	I(0)
Im, Pesaran and Shin W-stat Test					
FDI	-1.092	0.137	-6.216	0.000	I(1)
EMP	1.796	0.963	-2.529	0.006	I(1)
LEXCH	-1.088	0.138	-5.5017	0.000	I(1)
GCF	-1.682	0.046	-	-	I(0)
TOP	-1.693	0.045	-	-	I(0)
LRGDP	4.879	1.000	-3.737	0.000	I(1)
PGR	-8.782	0.000	-	-	I(0)
INF	-3.155	0.000	-	-	I(0)

4.2 Estimation

Table 5: Panel ARDL of FDI Inflows and Employment Generation in Selected ECOWAS Countries

Regressors	Long-run coefficient	t-stat	Short-run coefficient	t-stat
Dependent variable: EMP				
FDI	0.473** (0.018)	2.415	-0.005 (0.915)	0.107
TOP	0.034 (0.388)	0.867	0.002 (0.809)	0.242
LGDP	-7.332*** (0.000)	14.787	-0.4848*** (0.5987)	0.529
PGR	8.204*** (0.000)	4.166	1.2194 (0.6484)	0.458
GCF	0.581** (0.025)	2.287	-0.0110 (0.8738)	0.159
INF	-0.177** (0.004)	2.954	0.0166** (0.0323)	2.181
LEXCH	-2.286 (0.205)	1.279	-0.2365 (0.8822)	0.149
ECM	-0.094 (0.080)	1.769		

Notes: The value in parenthesis denotes the p-values *** significant at 1% **Significant at 5% *Significant at 10%

Table 5 shows the estimated Panel ARDL results of the long and the short run relationship between FDI and employment in ECOWAS sub region. It was observed that all the short-run coefficients except inflation rate are not significant. The implication of this result is that there is a lack of a short-run relationship between FDI and employment in the selected ECOWAS countries. This shows that FDI inflows did not contribute to employment generation in ECOWAS sub region in the short run. The reason for this result might be attributed to the inability of this economic bloc to transmit the spillovers of FDI inflows to the generation of employment in the short run. The adjustment coefficient is -0.094434 which has the expected sign and significant at 10% level. This result implies that the adjustment dynamic exists between the short run and the long run in FDI and employment across ECOWAS sub region. Therefore, 9% of the short-run perturbation is adjusted per annum for the equilibrium to be restored in the model.

Considering the long run coefficients, FDI and employment rate have a positive and significant relationship. A unit change in FDI inflows leads to a rise in employment rate by 0.47% in ECOWAS sub region. This implies that FDI has the capacity to generate employment in countries in ECOWAS sub region. This finding is in tandem with the submissions this finding is in tandem with some studies in extant literature (Saucedo *et al.*, 2020; Bogliaccini & Egan, 2017; Vergara *et al.*, 2015) but contradicts

others (Onimisi, 2014; Netrja, 2013). This finding is an indication that FDI provided the capital base in which the ECOWAS sub region utilized to experience increasing production, rise in the demand for labour and eventually rise in the wage rate and employment. GDP in log form and employment had a significant negative relationship. A unit change in LGDP reduces employment rate by 0.073%. In the same vein, population growth rate and employment rate had a positive but significant relationship. And as such, a unit change in population growth rate leads to 8.2% in employment in the ECOWAS sub region. The reason for this result might be attributed to the inability of economic growth to generate employment in ECOWAS countries. Capital accumulation had a significant positive relationship with employment generation. A unit change in capital accumulation leads to 0.58% in employment rate. Inflation rate had a significant inverse relationship. A unit change in inflation rate reduces employment rate by 0.18%. And exchange rate had a negative but insignificant relationship with employment rate. The economic implications of the above results are as follows; employment generation is positively induced by capital accumulation in Nigeria. Meanwhile, employment generation is negatively induced by inflation rate in the country. This implies that the ECOWAS economy is anti-Philip's curved.

4.3 Post Estimation Diagnoses

Table 6: Robustness Check

Long run	Coefficient	t-statistics	Prob. value
Dependent Variable: EMP			
FDI	0.042	0.123	0.904
TOP	0.079	0.958	0.355
LGDP	-3.721 **	2.769	0.016
PGR	3.895	1.710	0.111
GCF	0.034	0.208	0.838
INF	0.022	0.221	0.829
LEXCH	0.232	0.159	0.876
R-Squared	0.996		

*(**)** Significance at 10% (5%) 1%

For robustness check of the results obtained from Panel ARDL estimation, Panel DOLS was carried out using the same dataset analyzed with the Panel ARDL, the results of which are presented in Table 6, the coefficient of FDI was positive and statistically not significant corroborating the result of the long run estimate in Table 5.

Moreover, the coefficient of trade openness, population growth rate and capital accumulation were positive, though not significant at 10 percent level, thus, validating the Panel ARDL results. In addition, there is evidence from the panel DOLS estimation that LRGD was negative and statistically significant.

5. Conclusion and Recommendations

Attempt has been made in this study to account for the impact of FDI on employment in ECOWAS sub region over the period of 1990 to 2019. The study sets out to establish among others, the impact of FDI on employment. Various pre-estimation tests such as descriptive statistics, correlation analysis, panel unit roots, cointegration and optimal lag length selection were carried out. The short run and the long-run relationships of the variables were investigated via Panel ARDL technique. Consequently, the findings are summarized as follows: Firstly, cointegration test confirmed that a long run relationship existed among the variables. The existence of a long run relationship between FDI and employment in the panel of ECOWAS countries is economically meaningful because it suggests that FDI could generate employment in the long-run in this economic bloc.

FDI inflows significantly contributed to employment generation in the long run within ECOWAS sub region in the past three decades. Hence, this study provides the following vital policy recommendations for policymakers in ECOWAS sub region. The existence of a long run convergence between FDI and employment generation in the panel of ECOWAS countries suggests that FDI could generate employment in the long-run in this economic bloc. Therefore, policy measures that attract FDI should be implemented in ECOWAS sub region in order to deter unemployment in the longrun. Also, policymakers in this economic bloc should engage in policies and programmes that will promote conducive business environment, stable political and macroeconomic environment that will boost further attraction of FDI into all sectors of the sub regional economy.

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