Empirical analysis of the impact of globalization on labor force utilization: Evidence from Nigeria

Aremo, Adeleke Gabriel, and Alagbile Monica Adele
Obafemi Awolowo University, Ile-Ife

Abstract

In this study, the impact of globalization on labor force utilization, proxied as employment, in Nigeria was addressed with a view to assessing the extent to which globalization has influenced the structure of development in Nigeria. To achieve this, Augmented Dickey Fuller (ADF) test, and cointegration test were performed to investigate the unit root problem and the long run relationship among variables respectively; also an Error Correction Methodology was applied with a view to capturing both the short run and long run dynamic adjustments in employment model. The findings that emerged from the analysis showed that globalization practice could generate negative impact on employment in both short- and long run periods suggesting that if globalization continues as being practiced, globalization could further worsen the extant decrepit state of unemployment in Nigeria other things being equal. It is therefore recommended that government should confront the imminent unavoidable negative effects of globalization with a well –designed policy mix.

Introduction

The issue of globalization has received considerable attention in the literature pointing to the universal relevance of this concept in the contemporary global practice. As demonstrated by Fosu (2001), the importance of Globalization as a concept, particularly in less developed countries (LDCs) emanated from the general consensus in the trade literature that both trade policy openness and a faster expansion of trade are

positively correlated with growth, even after controlling for a variety of other growth determinants. Sachs and Warner (1997) showed that if sub-Saharan Africa had widely opened its economy as is the case with East Asia, the growth rate of sub-Saharan economy would have increased substantially by 2.4 percentage points more than the rate of 0.8 recorded within the study period between 1965 and 1990.

Nzekwu (1998) pointed out that on theoretical grounds; literature is replete with controversies about the relationship between the openness of an economy and economic growth rate. He observed that on empirical grounds results from previous studies had shown positive relationship between the openness of an economy and economic growth. Levine and Renelt (1992), using a large group of countries in cross-country estimates, showed that there is positive relation between economic growth and openness. The studies of Baldin and Seghezza (1992) supported the need for openness. Also, studies by Levine and Zervos (1998) and Levine and King (1992) found that globalization along financial policies could have positive effect on growth of the economy as financial sector has the potentials to diffuse and increase the macroeconomic efficiency of the overall economy. Obverse views that Globalization has not benefitted the Less Developed countries have been expressed by Adewuyi (2003). This view has also been supported by some studies like Tule (2003), Ozaghalu and Ajayi (2003) carried out in Nigeria.

Emanating from the above is the unending controversies associated with whether developing countries stand to benefit from the globalization practice or not. This present study is therefore set to provide empirically evidence to examine the extent of the contribution of globalization to the Nigerian economy. The paper is therefore divided into six sections. Besides the introduction section, section two discusses the theoretical framework and literature review, section three presents the model specification, data sources, and section four shows the techniques of analysis, section five presents the empirical results, while section six concludes the study.

Theoretical framework and literature review

The theory guiding this study is the neo-classical theory of foreign trade expressed as the classical theory of comparative cost advantage which states that global

output will assume its highest proportion if every country of the world specializes in the production of commodity in which it has the best comparative cost advantage. Thus Nigeria will be advised to specialize in the production and exporting of commodities that require low technology while the advanced countries of the world should specialize in production and exporting of commodities of high technological contents. If this pattern is followed, there is the tendency for Nigeria to remain perpetually underdeveloped.

An improvement on the above theory was developed by Heskcher-Ohlin and called Heskcher-Ohlin (HO) trade theory. This theory stipulates that world trade will substantially improve if the basis of trade is the intensity of factor endowment enjoyed by each country. This suggests that rich countries of the world endowed with abundant capital should specialize in the production of capital-intensive commodities while poor countries endowed with labor factor should specialize in the production of commodities with high labor content. The theory suggests that a consistency of this trend will ensure international convergences in international prices, and improvements in the returns to labor in less developed countries.

The fact emanating from Heskcher-Ohlin trade theory is that less developed countries stand to gain in international trade in the following areas: the standards of living of their human resources is bound to improve and thus enhances a reduction in poverty among the population. Also, there are tendencies to achieve convergence in the absolute poverty incidence between the rich and poor countries (Ozaghalu and Ajayi, 2003).

Adewuyi (2003) examined the extent to which Nigeria could benefit from globalization using descriptive analysis. He noted that the present Nigeria's economic structure does not appear to meet the international standard for operation of globalization especially in the areas of large -scale reductions in trade barriers, competitiveness of price sector activities and provision of favourable macroeconomic environment and infrastructure. The findings of Tule (2003), Ozaghalu and Ajayi (2003) supported Adewuyi's view but emphasized that the negative effects of globalization could generate a rising inequity and inequality in the distribution of the dividends of globalization.

There are evidences in the literature showing negative job implications of globalization for developing countries. Thus globalization could perhaps lead to job

losses resulting from the use of information technology (Ayres 1998, Heilbroner 1996). The implications of globalization for labor and wages showed that liberalization of international trade and capital flows will produce asymmetry between groups who can cross international borders and those that could not especially the unskilled and semi-skilled workers; leading to deepening of earnings gap and inequality within skilled groups.

Chete (2003) examined globalization and the position of nation state in globalization. He was pessimistic about the relevance of globalization to the economic development of Nigeria and therefore suggested that state should position itself fully to forestall any unsavory implications emanating from globalization.

Ndiyo and Ebong (2003) studied the effects of globalization and concluded the effects are mixed. The negative effects having emanated predominantly from the structure of the economy which was not sophisticated enough to absorb the shocks arising from the global environment.

Model specification and data sources

The model adapted in this study is based on the national income accounting in an open economy derived from the work of Obaseki (1991) and Ndiyo and Ebong (2003). Here, the aggregate demand (AD) is expressed identically as follows:

$$AD = Yd = C + I + G + (X - Z) \tag{1}$$

Where Yd = aggregate demand (AD); C=Consumption expenditure; I=Investment Expenditure; G=Government Expenditure; X= Value of export goods and services; Z= value of import goods and services. Aggregate supply (AS) could also be expressed as an identity as:

$$AS = Ys = C + S + T \tag{2}$$

Where Ys = Aggregate Supply (AS); S=Savings; T=taxes.

In line with the Keynesian theory, aggregate demand and aggregate supply are equated to establish the equilibrium level of output and employment expresed as:

$$C+S+T = Y= C+I+G+(X-Z) \qquad (3)$$

After re-arrangement, $Y-(C+I+G)=X-Z \qquad (4)$

$$Y-A=X-Z \qquad (5)$$

Where $A=(C+I+G)$ is the domestic assumption $X-Z$ is the external current account balance. A surplus on Current Account (CA) implies that domestic absorption is smaller than domestic national income. while excess of domestic absorption over national income is equal to external current account (CA) deficit.

When Equation (5) is augmented by portfolio balances, the model takes account of of factors constituting the external components of output. The portfolio adjustments thus account for changes in yield that could arise from interest rate differentials. Drawing on the Mundel-Fleming model of open macro-economics, the ultimate difference between the yield on domestic and external investments could converge.

Following from the analysis above, a nested model incorporating the various financial integration and trade openness variables is derived:

$$EMP=g(OPEN,FDI,EXR,FEXR,NFI,INF,MS,BOP) \qquad (7)$$

where GDP is gross domestic product; OPEN is the openness of the economy (Exports plus Imports divided by GDP); FDI is foreign direct investment; EXR is the external reserves; FEXR is the foreign exchange rate; INF is Inflation rate; MS is the Money Supply; BOP is the Balance of Payments; and EMP is the Employment level.

When equations (6) and (7) are log-linearised, the following model emerges:

$$\log EMP = \beta_0 + \beta_1 OPEN + \beta_2 \log FDI + \beta_3 \log EXR + \beta_4 \log FEXR$$
$$+ \beta_5 \log INF + \beta_6 \log MS + \varepsilon \qquad (8)$$

Where:

The a priori expectations for the coefficients of foreign direct investment, exchange rate reserves, inflation and money supply are positive signs while those of openness proxied by globalization, and the constant coefficient of   are predominantly unstable in signs.

Data sources

The data for this study were obtained from the Central Bank of Nigeria Statistical Bulletin, World Development Indicators, International Monetary Fund's publications and National Bureau of Statistics publications.

Techniques of analysis

The methods of analysis adopted in this study commenced with Unit roots test and cointegration tests carried out initially to test for the robustness of the data series. Specifically unit root test is conducted to determine the stationarity of variables using Augmented Dickey Fuller (ADF) test. As demonstrated by Granger (1981) and Engle and Granger (1987), a non-stationary series is integrated of ordered if it achieves stationarity after being differenced d times. Such a series is expressed as I(d). It is possible for a combination of some series to achieve long run equilibrium, although they may be individually non-stationary. Such a relationship shows that the series are cointegrated. For some series to cointegrate in the long run, they must be of the same order of integration. As long run relationship is established among the same order of integration series, a regression containing all the variables of cointegrating vector will have a stationary residual term. Asteriou and Hall (2006) argued that where there are more than two variables in a model, there is a possibility that the emerging cointegrating vectors governing the joint evolution of all the series will be more than one. This logic presents the superiority of Johansen Cointegration test over the Engle Granger approach. Thus Johansen Cointegration approach will be adopted in this study,

The next step is to apply the Error Correction technique. The Error Correction technique is used to capture both the short run and long run dynamic adjustments in the models

Error correction model (ECM)

The methods of analysis adopted in this study focus on investigating the influence of globalization proxied as the degree of openness of the economy and some other policy variables on economic growth and employment level in the Nigerian economy.

A significant aspect of the model estimation is the estimation of the short run model which is the dynamic error representation of the series specified in equations (8) and (9) above. For any set of cointegrated variables, there is evidence of error correction representation of the data. The error correction mechanism is a systematic disequilibrium adjustment process by which an untamable drift from equilibrium is prevented. From these equations, we obtain one year period lag error correction terms which are then incorporated into the overparameterised models formulated to deal with mis-specification problems. The overparameterised models are however reparameterised as Error Correction Model. Through the process of continuous stepwise reduction of relatively insignificant parameters in the overparameterised ECM models, parsimonious models are obtained. The tranformed models take the following forms:

$$D(LEMP)=\beta 0+ LEMPt\text{-}i+ LOPENt\text{-}i+ LFDIt\text{-}i+ LEXRt\text{-}i + LFEXRt\text{-}i$$
$$+ LINFt\text{-}i + LMSt\text{-}i + t\text{-}1 +\varepsilon t \qquad\qquad (9)$$

The ECMt-1 in equation (9) is the one- year period lagged of the employment level error correction term obtained from static regression of equation (8). As all the variables are first-differenced to make them stationary, Ordinary Least Squares method gives consistent and valid estimate (Enders, 1995). Δ implies first-difference; and the speed of adjustment is represented as $\beta 21$.

Table 1: ADF Tests Results for Unit Roots

Variables	Type of ADF Test	ADF Statistics(At Levels)	ADF Statistics(At Levels)	ADF Statistics(At Levels)	Order of Integration
LEMPL	Intercept without trend	-3.3041	-6.2823	-4.4522	*I*(0)
LMS2	Intercept with trend	-2.7173	-6.4607	-8.8381	I(1)
LEXTRES	Intercept with trend	-2.7220	-7.4098	-5.1437	I(1)
LFDI	Intercept with trend	-1.7405	-4.8963	-9.7738	I(1)
LFEXR	Intercept with trend	-2.3029	-4.8811	-8.8435	I(1)
LGDP	Intercept with trend	-1.7270	-4.2014	-6.9399	I(1)
LINFL	Intercept without trend	-3.5870	-6.5765	-6.3276	I(0)
LOPEN	Intercept without trend	-3.5763	-7.3573	-10.7560	I(1)

Source: Computed by the authors

Notes: ADF test statistics are computed using regression with an intercept, with or without linear trend. Critical values are calibrated from Mackinnon (1991) as reported by E-views software 6.0. as follows: Critical values for intercept without trend are: 1% (-3.6329); 5%(-2.9484); and 10% (-2.6129). Critical values for intercept with trend are: 1% (-4.3393); 5%(-3.5875); and 10%(-3.2292).

Empirical results

Unit roots test results

Table 1 presented the result of stationarity test to examine the order of integration of the time series using Augmented Dickey Fuller (test). The series were first examined

to check whether they are trended or not. It was observed that the following series are trended: foreign direct investment, external reserves, foreign exchange rates, gross domestic product, and broad money supply; while the variables of employment, inflation, and openness remain untrended.

As shown in the table, all the series except the log of employment and inflation show evidence that they are integrated of order one. The log of employment and inflation are stationary at levels.

Test Results for Cointegration

As ADF test has shown, the time series are mainly integrated, therefore there is the need to check for long run convergence to a unique equilibrium by all the integrated series. The result of Johansen Cointegration test for the model of employment in this study is presented in tables 2. As shown in table 2, all the variables in employment model are cointegrated with 2 cointegrating vectors. .

Table 2: Johansen Cointegration Test Result for Employment Model Variables

Hypotheses					
Null	Alternative	Test Statistics	Eigen values	Critical Values (5%)	Probability**
r=0*	r=1	183.0412	0.820187	150.5585	0.0002**
r=1*	r=2	124.7027	0.731236	117.7082	0.0167**
r=2	r=3	80.02935	0.552897	88.80380	0.1816
r=3	r=4	52.66052	0.465987	63.87610	0.3036
r=4	r=5	31.33110	0.359947	42.91525	0.4252
r=5	r=6	16.16015	0.229297	25.87211	0.4798
r=6	r=7	7.304762	0.193334	12.51798	0.3138

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Source: Computed by the Author.

Table 3: Normalising the unemployment model to employment variable (standard errors in parentheses)

LEMP	LEXRES	LFDI	LFEXR	LINFL	LMS2	LOPEN
1.000000	1.810687	1.097606	15.90623	22.86006	31.58785	-21.32020
	(3.15754)	(6.15458)	(4.39145)	(3.00792)	(10.6232)	(9.43920)

Source: Computed by the author.

As shown in table 2, all the variables in employment model are cointegrated with 2 cointegrating vectors. A normalization of the model of Employment to employment variable produced the results presented in table 3. The can be interpreted as the long run relationship between the employment and the vector of exogenous variables.

In the long run, there is a negative relationship between employment and external reserves. A one per cent point increase in external reserves will lead to 1.8 per cent increase in employment. The coefficient of external reserves is not however significant at 5 per cent. Foreign direct investment (FDI) conforms to the a priori expectation being of positively related to employment, though with low magnitude. FDI is however revealed to be insignificant. Foreign exchange rate equally conforms to the a priori expectation of positive sign in relation to employment and it is of high magnitude of 15.9 implying that a 1 per cent point increase in foreign exchange rate will generate a 15 per cent point increase in employment. Foreign exchange rate variable is however significant at 5 per cent level. The variable of inflation also conforms to the a priori expectation of positive sign and its coefficient is significant at 5 per cent. This position is logical within the framework of the monetarist proposition that economic growth will be enhanced when money supply is increased in an economy. This has the propensity to rapidly heat up the economy by way of inflation which enhances the performance of real sector and financial sector. This is line with Bose (2002) and Huybens and Smith (1999).

The money supply variable is positively related to the employment variable. This conforms to the a priori expectation of positive sign and the coefficient is not only of

high value, it is also significant. A one per cent point increase in money supply leads to 32 per cent point increase in employment.

The openness variable which is the focal point of this study does not bear the expected positive sign, although it is highly significant at 5 per cent level. The magnitude of openness variable is 21.3 suggesting that a 1 per cent point increase in openness will lead to 21.3 per cent point decrease in employment. This supports the findings of Chete (2003) in Nigeria, and Jha (2003) in India. They found evidence of inverse relationship between globalization proxied as openness and development indicator variable. . This finding however is contrary to those of Levine and Renelt (1992), Seghezza (1992), Zervos (1998), and Levine and Zervos (1998), who found evidence of negative relationship between openness and development indicator variable.

The employment model shows similar robustness test results as presented in tables 4 and 5.

The probabilities for the F-statistics for both Breusch- Pagan-Godfrey test and Breusch-Godfrey serial Correlation Lm tests are high, suggesting the abscence of Serial correlation and heteroskedasticity in the residuals. All these evidences guarantee the unbiasness and the efficiency of the estimates.

Table 4: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.111368	Prob. F(12,20)	0.4030
Obs*R-squared	13.20183	Prob. Chi-Square(12)	0.3545
Scaled explained SS	3.691485	Prob. Chi-Square(12)	0.9884

Source: Computed by the authors.

Table 5:   Breusch-Godfrey Serial Correlation LM Test:

F-statistic	4.236076	Prob. F(2,19)	0.0301
Obs*R-squared	9.756639	Prob. Chi-Square(2)	0.0076

Source: Computed by the authors.

Error correction models

The result presented in table 6 is the parsimonious versions that emerged as a reduced form of the overparameterised versions of the long run models which were obtained from a systematic reduction of insignificant coefficients until the best robust models were obtained. The basis of model selection was Schwart Criteria (SC) and Akaike Information Criterion (AIC). The objective was to ensure that each of the models's overparameterised SC and AIC values are more than those of the parsimonious models. For employment model, SC and AIC in the overparameterised model which were 4.30 and 3.35 reduced to 3.50 and 2.91 respectively.

From table 6, the coefficients of the lagged values of employment variables are significantly positively related to the employment variable. There coefficient values of 0.91 and 0.47 for first and second period lags imply that a one per cent point increases in the first and second period lags employment variables will lead to 0.91 and 0.47 per cent point increases in the employment variable respectively. The contemporaneous value of external reserves is insignificantly positively related to employment variable with a value of 0.26. The coefficient value for one-year period lag is -0.24 and it is not significant at 5 per cent level.

The 2.24 coefficient value of two-year period lagged of foreign direct investment (FDI) which is both positive and significant implies that in the short run a one per cent point increase in FDI will lead to 2.24 increase in employment. The contemporaneous coefficient of Foreign exchange rate (FEXR) of 0.87 is positive but insignificant at 5 per cent level. The one-year and two-year period lagged values of 0.76 and 0.93 for FEXR are negative and insignificant at 5 per cent. As observed in the long run analysis previously, perhaps this might be a good indication that the various foreign exchange regimes introduced by the Nigerian governments are an avowal of the insignificant contribution of foreign exchange rates introduced by the governments.

The two-year period lagged value of inflation variable of 0.14 is positive but insignificant in the short run. This implies that a one per cent point increase in inflation variable will lead to 0.14 point increase in employment variable. Although inflation variable is not

significant, the positive influence of this variable suggests that if it is appropriately managed, it could be useful as an employment enhancing strategy.

A one-year period lagged value of 0.93 for money supply is both negative and insignificant in the short run. A one per cent point increase in money supply variable will lead to 0.93 point decrease in employment. This is pointing to the fact that if money supply is not well managed in the short run, it could aggravate the existing unemployment situation in Nigeria.

Table 6: Parsimonious Error Correction Model for Employment. Dependent Variables DLEMP

	Coefficient	Std. Error	t-Statistic	Prob.
DLEMP(-1)	0.915115	0.260558	3.512130	0.0022
DLEMP(-2)	0.478031	0.199082	2.401179	0.0262
DLEXTRES	0.258061	0.173557	1.486896	0.1526
DLEXTRES(-2)	-0.235205	0.201138	-1.169373	0.2560
DLFDI(-2)	2.237488	1.022421	2.188421	0.0407
DLFEXR	0.867004	0.604603	1.434006	0.1670
DLFEXR(-1)	-0.763425	0.663583	-1.150460	0.2635
DLFEXR(-2)	-0.927055	0.605641	-1.530699	0.1415
DLINFL(-2)	0.142193	0.234577	0.606168	0.5512
DLMS2(-1)	-0.931148	0.719261	-1.294589	0.2102
DLOPEN	-2.179345	0.777106	-2.804437	0.0109
DLOPEN(-2)	1.063837	0.604839	1.758878	0.0939
ECM1	-1.281659	0.305205	-4.199331	0.0004

R-squared	0.672339	Mean dependent var	0.088703
Adjusted R-squared	0.475743	S.D. dependent var	1.238557
S.E. of regression	0.896785	Akaike info criterion	2.907102
Sum squared resid	16.08445	Schwarz criterion	3.496635
Log likelihood	-34.96718	Hannan-Quinn criter.	3.105462
Durbin-Watson stat	1.757803		

Source: Computed by the authors.

The contemporaneous openness variable is negatively related to employment in the short run. The coefficient value of 2.18 suggests that a one per cent point increase in openness will lead to a reduction in employment by 2.18; and the coefficient is also significant at 5 per cent level. This finding supports the findings of Chete (2003) in Nigeria, and Jha (2003) in India. This finding however is contrary to those of Levine and Renelt (1992), Seghezza (1992), Zervos (1998), and Levine and Zervos (1998). The 1.06 coefficient of the second lagged variable of openness which is positive is however not significant at 5 per cent. It thus appears that the overall negative effect of openness variable crowds out the positive impact in the short run.

The extent to which any previous disequilibrium in the employment variable is adjusted for in the current year is captured by the coefficient of the error term. In the present case, the coefficient has the expected negative sign and it is significant. The value of the error correction coefficient of 1.29 implies that 129 per cent of any previous disequilibrium in economic growth variable is adjusted for the following year. This implies that economic growth variable has high adjustment potentials to endogenous policy variables.

The adjusted R-Squared of 0.67 is an indication that 67 per cent of the variation in the employment dependent variable is explained by the variation in independent variables. Also, the Durbin-Watson statistic of 1.76 which shows positive autocorrelation is a tolerable value, particularly as the Breusch-Godfrey serial correlation comfirmed the absence of serial correlation to suggest the absence of serial correlation that could adversely affect the efficiency of the estimates.

Conclusion

The findings that emerged from this study show that globalization practice could generate negative impact on employment in both short- and long run periods; suggesting that if globalization continues as presently practiced in Nigeria, there is the danger that globalization could further worsen the extant decrepit state of unemployment in Nigeria, other things being equal.

Following from these findings, is the policy implication that the government will need to re-examine its various economic policies with the aim of generating an optimum policy mix that could enhance the level of employment in the economy. It is therefore suggested that a virile policy mix should include a menu of fiscal, monetary and income policies directed at unemployment targeting. The government should be prepared to provide robust social security services in form of unemployment benefits that will cushion the effect of unemployment problem and other social ills resulting from the globalization phenomenon. In addition, such a policy mix must necessarily be vigorously and religiously pursued irrespective of any change in the nation's leadership.

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Appendix

Table 7: Overparameterised version of employment model

Dependent Variables DLEMP

	Coefficient	Std. Error	t-Statistic	Prob.
DLEMP(-1)	0.937441	0.394838	2.374241	0.0351
DLEMP(-2)	0.448600	0.282608	1.587358	0.1384
DLEXTRES	0.177103	0.275588	0.642638	0.5325
DLEXTRES(-1)	-0.132918	0.333898	-0.398080	0.6976
DLEXTRES(-2)	-0.271252	0.309178	-0.877334	0.3975
DLFDI	0.240098	1.145233	0.209650	0.8375
DLFDI(-1)	0.542063	1.409902	0.384469	0.7074
DLFDI(-2)	2.059203	1.587592	1.297061	0.2190
DLFEXR	0.705486	0.989706	0.712824	0.4896
DLFEXR(-1)	-0.861048	0.949948	-0.906416	0.3826
DLFEXR(-2)	-0.860558	0.864733	-0.995172	0.3393
DLINFL	0.031945	0.497763	0.064177	0.9499
DLINFL(-1)	0.042207	0.300347	0.140526	0.8906
DLINFL(-2)	0.169407	0.357088	0.474411	0.6437
DLMS2	0.234006	0.999654	0.234087	0.8189
DLMS2(-1)	-0.917077	1.298684	-0.706159	0.4936
DLMS2(-2)	-0.336953	1.814276	-0.185723	0.8558
DLOPEN	-1.775281	1.180156	-1.504276	0.1584
DLOPEN(-1)	0.233314	1.004308	0.232313	0.8202
DLOPEN(-2)	1.105013	0.846112	1.305990	0.2160
ECM1	-1.366898	0.442144	-3.091521	0.0093
R-squared	0.686577	Mean dependent var		0.088703
Adjusted R-squared	0.164206	S.D. dependent var		1.238557
S.E. of regression	1.132311	Akaike info criterion		3.347525
Sum squared resid	15.38554	Schwarz criterion		4.299848
Log likelihood	-34.23416	Hannan-Quinn criter.		3.667952
Durbin-Watson stat	1.873399			