Macroeconomics and Monetary Economics

Impact of Macroeconomic Policies on Poverty and Unemployment Rates in Nigeria, Implications for Attaining Inclusive Growth

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Abstract: This paper examined the effect of macroeconomic policies on unemployment and poverty rates in Nigeria from 1980 to 2013 with implication to achieving inclusive growth. The inability of macroeconomic policies in addressing the rising issues unemployment and poverty rates in Nigeria despite the impressive economic growth experience over the last decades has increasingly called for the need for the pursuance of inclusive growth to address the social issues of unemployment and poverty rate. Previous studies have not considered the extent to which macroeconomic policies affects unemployment and poverty rate in Nigeria, and the implication of this relationship to the attainment of inclusive growth in Nigeria. The study adopts the Ordinary Least Square (OLS) technique. The study observed that among macroeconomic policy variables only exchange rate significantly influenced unemployment rate while only fiscal policy significantly influenced and poverty rate. This implies that present macroeconomic policies in Nigeria do not guarantee the attainment of inclusive growth in Nigeria. The contribution of the paper is that to achieve inclusive growth that guarantees high employment and reduced poverty rate, there is the need for a re-examination of macroeconomic policy management in Nigeria.

Keywords: macroeconomic policies; poverty; unemployment; inclusive growth.

JEL Classification: E24; E52; E62; I32; O40

1. Introduction

The importance of inclusive growth is increasingly being recognised and highlighted in work plans and strategies of Millennium Development Goals (MDGs) crusaders (such as International Monetary Fund (IMF), G20, European Commission and the UK's Department for International Development); due to the failure of macroeconomic policies in creating productive employment opportunities and addressing issues of poverty and income inequalities prevailing in developing countries. While macroeconomic policies have played an indispensable role in the achievements of recent impressive growth experienced by some developing counties, such recent growth patterns have bypassed important segments of the

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society; thereby undermining its sustainability and further entrenching existing poverty level, unemployment rates and income inequalities (Pedro and Paula, 2013)[1]. With respect to Nigeria, available data show (see Fig 1 and table 1 below) that over the past three dates (1981 to 2010), the Nigerian economy grew from an average growth rate of 0% between 1981 and 1990 to 3% between 1991 and 2000 and further to 6.5% between 2001 and 2010. Disappointedly, the average growth of the aggregate economy was accompanied by increased in the average growth of unemployment and poverty rates from 3.93% and 42.07% respectively between 1981 to 1990 to an alarming rate of 14.7% and 63.99% respectively between 2001 and 2010. Also, within this period the disparity in income distribution (measured by Gini Index) rose from 34.18 in 1980 to 42.9 in 2004 and further to 48.8 in 2013 (World Bank Indicators, 2013).
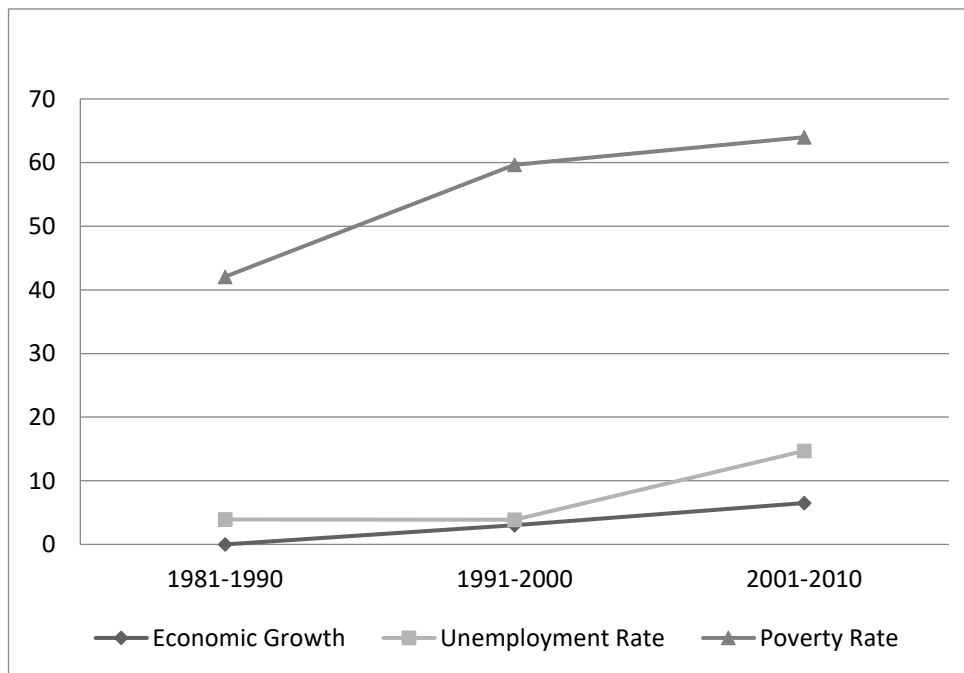

Figure 1. Average Growth Rates of Economic Growth, Unemployment and Poverty Rates (1981-2010)

Source: Authors computation using data from CBN annual reports and NBS Bulletin of various Editions.

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[1] Martins (2012) noted that in Mozambique, the growth of GDP by an average rate of 8% during 2002 to 2008 was accompanied with an increase in poverty rate.

Table 1. Average Growth Rates of Economic Growth, Unemployment and Poverty (1981 to 2010)

Years	Economic Growth	Unemployment Rate	Poverty Rate
1981-1990	0	3.93	42.07
1991-2000	3	3.88	59.65
2001-2010	6.5	14.7	63.99

Source: Authors computation using data from CBN annual reports and NBS Bulletin of various Editions.

This inconsistent link of rising economic growth rates with rising unemployment, poverty and income inequality; undoubtedly demonstrate that the trickle-down effect of such growth is utterly inconsequential on the welfare of the greater Nigerian populace. The above further demonstrates that despite the notable growth rate experienced over the years, the problems of unemployment, poverty and income inequality appears a pig-headed one.

Apart from the foregoing, macroeconomic policy is also intended to achieve full employment level. Achievement of full or sustainable employment opportunities is a key dimension to wellbeing and human development; because employment is the main mechanism through economic growth translates in poverty reduction accompanied by reduction in income inequalities (Pedro and Paula, 2013). Also, employment opportunity is a major channel of addressing poverty.

While acknowledging the inestimable importance of macroeconomic policies, it is however worrisome to note that over the past decades, there is little or no evidence of a meaningful impact of such macroeconomic policy on employment and poverty rates in Nigeria. This inconsistent scenario between macroeconomic policies and unemployment and poverty rates makes it unclear on the exact empirical relationship between these variables. Against this backdrop, this seeks to empirically examine the following research question: Do macroeconomic policies affect unemployment and poverty rates in Nigeria? If yes, which of the macroeconomic policies (monetary, fiscal or trade policy) affect unemployment and poverty rate the most?

Although, empirical literature on this issue have produced inconclusive results (Holden and Sparrman, 2013), the issue is even more worrisome as previous indigenous studies have paid little or no attention to this issue. Bulk of the indigenous studies on government spending has focused on macroeconomic policy (monetary, fiscal or trade policies) and economic growth nexus (see Taiwo and Agbatogun, 2012; Bakare, 2012; Uma et al, 2013; Onakoya and Somoye, 2013) while other focused on the impact of economic growth on unemployment and poverty (see Ijaiya, Ijaiya, Bello and Ajayi, 2011; Sodipe and Ogunrinola, 2011; Oloyede, 2014). Thus, examination this issue becomes pertinent because, increasing unemployment and

poverty rates can have significant negative social and economic consequences—making reforms more difficult, constraining economic growth, undermining social cohesion and stability, derailing various ongoing policy reforms (Lin et al., 2008) and even undermining the country's long term desire of achieving inclusive growth and development. Thus, without an utmost and urgent attention to this issue, it is doubtful how the Nigerian government hopes to attain the country's goal of becoming one of the top 20 economies by year 2020 (Nwosa, 2014). Also, the outcomes of this study will aid policymakers on the prudent management of macroeconomic policy in achieving inclusive growth which is pivotal to tackling unemployment, poverty and income inequality.

2. Literature Review

Barcena, Prado, Rosales and Perez (2014) examined the role of international trade in influencing inclusive development. The findings of the study showed that international trade does not automatically contribute to inclusive development. Inclusive development is observed to depend crucially on the quality of the public-private policies that direct and complement it. The study further noted that inclusive development is a type of growth that generates a more equitable labour force, production structure and society; the outcome of which depends mainly on policies that promote production convergence and institutional reforms and guarantee social protection.

Oloyede (2014) examined the effect of poverty reduction programs on economic development in Nigeria for the period 1980 to 2010. Using the Ordinary Least square (OLS) regression technique, the study observed that economic development significantly contributed to poverty reduction in Nigeria. The study recommended that government policy on poverty alleviation should follow a multi- sectoral approach where all stakeholders are given specific roles to play. Kasha (2014) examined the impact of macroeconomic variables on poverty level in Iranian. The macroeconomic variables used are economic growth, inflation, government expenditure and unemployment rate. Using the Ordinary least Square (OLS) technique, the study observed that economic growth has negative and significant effects on poverty in Iran while unemployment and inflation have positive effects on poverty. Also, social security expenditure relating to government expenditure has insignificant effects on poverty.

Nwosa (2014) examined the impact of government expenditure on unemployment and poverty rates in Nigeria for the period spanning 1981 to 2011. The study employed an Ordinary Least square (OLS) estimation technique. From the empirical analysis, the study observed that government expenditure had positive and significant impact on unemployment rate while government expenditure had a negative and insignificant impact on poverty rate. Based on the findings, this study

recommended that urgent attention should be accorded to rising unemployment and high poverty rates in order to achieve objective 20-2020 and of halving poverty rate by 2015. Okungbowa (2014) examined the impact of globalization on poverty rate in Nigeria for the period 1981 to 2009. The study employed co-integration and error correction modelling techniques. The co-integration estimate showed the existence of a long run relationship between poverty rate and the explanatory variables while error correction estimate showed that globalization (proxy by trade openness) had a negative and significant effect on poverty rate in Nigeria. Thus, the study recommended the need for government to encourage globalization, by embarking on trade liberalization policies in order to accelerate and sustain industrial growth which is capable of reducing poverty rate in Nigeria.

Ogujiuba (2014) x-rayed poverty issues in Nigeria and reviewed poverty reduction measures between 2007 and 2012; and identified pertinent issues that could orchestrate MDGs targets to a stalemate; which include poor targeting of recipients' in the previous poverty reduction measures, lack of necessary infrastructure, corruption amongst others. Employing descriptive analysis, the study suggests that new poverty reduction strategies for Nigeria should be anchored on inclusive growth fundamentals, redistributive public expenditure, increasing rate of productive job creation and a broad based sectoral growth. The study recommended that growth should be broad-based, cutting across all sectors and inclusive of the large part of the workforce that poor men and women make up. Also, new strategies should encompass the key elements of benefit incidence amongst the poor population, to support Nigeria's current development agenda. Akinmulegun (2014) examined the link between unemployment and poverty in Nigeria. Using descriptive statistics - charts, percentages and ratios, the study observed that unemployment is a major cause of poverty in Nigeria. Therefore, the study recommended a structural shift in the macroeconomic policies towards employment generation.

Umaru, Donga and Musa (2013) examined the effect of unemployment and inflation on economic growth in Nigeria for the period 1986 to 2010. The study employed the Granger causality and Ordinary Least Square (OLS) regression techniques. The causality estimate showed that a unidirectional causation from unemployment and inflation to economic growth while no feedback causation was observed from economic growth to unemployment and inflation rate. The regression estimate showed that unemployment and inflation had positive impact on economic growth. Thus, the study recommended the need for a concerted effort by policy makers to increase the level of output in Nigeria by improving productivity/supply in order to reduce unemployment and inflation rate so as to boost the growth of the economy. Eneji, Mai-Lafia and Weiping (2013) examined the relationship between social policy, economic development, education and unemployment rate in Nigeria for the period 1990 to 2011.using an Ordinary Least Square, the study observed an insignificant effect of the explanatory variable on employment in Nigeria. Thus, this

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study recommended that agriculture and tourism should be main priority sectors for employment creation. The study also agitated for entrepreneurship, infrastructure construction for both rural and urban geography, stable polity, maximum security, sound education and health system, international partnership as well as regional economic, social and political integration.

Khalil and Ammara (2011) analyzed the determinants of poverty in Pakistan for the period 1974 to 2009. The study employed bounds testing co-integration approach. The study observed that education, unemployment and economic growth are significant determinants of poverty in Pakistan while inflation rate was insignificant in determining poverty in Pakistan. Ijaiya, et al. (2011) analyzed the impact of economic growth on poverty reduction in Nigeria for the period 1980 to 2008. The study took into account a time subscript and a difference-in-difference estimator that describes poverty reduction as a function of changes in economic growth. using an ordinary least square, the study observed that the initial level of economic growth had insignificant effect on poverty reduction while change in economic growth had significant effect on poverty reduction. Thus, the study recommended the need to ensure stable macroeconomic policies, huge investment in agriculture, infrastructural development and good governance.

Azizi, Yazdani, Aref and Taleghani (2011) examined the effect of macroeconomic policies on poverty in Iran. Specifically, the study analysed the effectiveness of government intervention on poverty groups using a general equilibrium model and the social accounting matrix of year 2002 was used to estimate the general equilibrium model. The findings of the study showed that absolute poverty line for the urban and rural regions are 3.7 and 2.4 million Rials respectively. The study further revealed that a greater percentage of Iranian households are living under the poverty line. Sodipe and Ogunrinola (2011) examined the effect of economic growth on employment in Nigeria for the period 1981 to 2006. Using an Ordinary Least Squares technique, the study observed that a positive and statistically significant relationship exists between employment level and economic growth in Nigeria while a negative relationship was observed between employment growth rate and the GDP growth rate in the economy. The study recommended the need for increased labour-promoting investment strategies that will help to reduce the high current open unemployment in Nigeria.

Agu and Evoh (2011) examined the prospects and challenges of productive employment and decent work in Nigeria within essential macroeconomic policy targets for the period 1961 to 2009. Using a recursive structural Vector Autoregressive model, the study observed that increases in monetary policy rate (MPR) to cut down on inflation have a depressing impact on the economy. This findings study does not support the assertion that a tight monetary policy coupled with a contractionary fiscal policy will engender natural rate of growth of the Nigerian economy. This is contrary to persuasive monetary policy advice for

inflation targeting pursued by central banks and the International Monetary Fund (IMF). The study recommended that a more flexible inflation rate, increased money supply, access to credit and a modest but upward adjustment to capital and recurrent expenditure would have greater potential in accelerating GDP growth and for the attainment of full employment and poverty reduction in Nigeria. Mehmood and Sadiq (2010) examined the relationship between government expenditure and poverty in Pakistan for the period 1976 to 2010. Using the error correction modelling technique, the study observed that government expenditure had negative and significant impact on poverty rate both in the long run and short run.

Gillani, Rehman and Gill (2009) examined the relationship among unemployment, poverty, inflation and crime in Pakistan for the period spanning 1975 to 2007. The study employed the Johansen Co-integration and Granger Causality techniques to observe the long run and short relationship among the variables. Based on the co-integration result, the study observed the existence of a long-run relationship among unemployment, poverty, inflation and crime in Pakistan while the Granger causality estimate observed a unidirectional causality from unemployment, poverty and inflation to crime in Pakistan. Based on the above findings, the study recommends that economic growth with social and economic justice should be a key objective of the planning strategy of the Pakistan government for crime to reduce. The study also recommended that the key determinants of crime – unemployment, inequalities and economic growth should be addressed adequately by policymakers, so as to checkmate the rising rate of crime in Pakistan.

Iceland, Kenworthy and Scopilliti (2005) analyzed the impact of macroeconomic performance on poverty in the United States of America (USA) during the 1980s and 1990s. Macroeconomic performance was proxied by employment, unemployment and per capita gross state product) while poverty rate was proxied by absolute and relative poverty rate. Utilizing a multiple regression estimate, the study observed the importance of employment for poverty reduction. Specifically, the study observed that employment contributed to lower absolute and relative poverty by boosting hours worked and wages in low-income households. Also, per capita gross state product contributed to lower absolute poverty by increasing hours worked and low-end wage levels, but it had very little impact on relative poverty because it also was associated with increased wage inequality. However, unemployment had little or no effect on both absolute and relative poverty.

Amiad and Kemal (1997) examined the impact of macroeconomic policies on the poverty levels; and also analysed the impact of Structural Adjustment Programmes on the levels of poverty in Pakistan for the period 1963 to 1992. Specifically, the study examined the effect of factors - economic growth, agricultural growth, terms of trade for the agriculture sector, industrial production, rate of inflation, employment, wages, remittances, and the tax structure on poverty level. The study cautioned that on account of the limited number of observations the results of the

study should be interpreted cautiously. The findings of the study suggests that at a growth rate above a threshold level of about 5 percent, increase in employment, and remittances are the most important variables explaining the change in poverty. The study also observed that policies pursued under the Structural Adjustment Programme tend to increase the poverty levels mainly because of decline in growth rates, withdrawal of subsidies on agricultural inputs and consumption, decline in employment, increase in indirect taxes, and decline in public expenditure on social services. The study recommended the need for the promotion of employment programmes and the development of informal sector enterprises, which are essential in addressing poverty.

3. Research Methodology

Although studies have acknowledged that without economic growth, the prospects for creating decent employment and reducing poverty are significantly diminished (Pedro and Paula, 2013). Nonetheless, recent findings have observed in many developing countries (Nigeria inclusive), that the link between economic performance (growth) and unemployment rate on the one hand; and between economic growth and poverty rate the other hand appear to be weak. However, empirical literatures predict that macroeconomic policies play an important role in addressing the problems of unemployment and poverty (Amiad and Kemal, 1997; Cashin, Mauro, Pattillo and Sahay, 2001; Azizi, et al., 2011)). Thus, this study seeks to examine the direct impact of macroeconomic policy on unemployment and poverty. To this end, this study specifies a simple model below to deal with macroeconomic policies, unemployment and poverty in Nigeria.

$$X_t^i = f(MP_t, Z_t) \tag{1}$$

Where X_t is the dependent variable and i refers to unemployment (*UNE*) and poverty (*POV*) rate, MP refers to macroeconomic policies (monetary (*MON*), fiscal (*FIS*) and exchange rate (*EXH*)) and Z refers to other macroeconomic variables – economic growth (*EG*), trade openness (*OPNX*) and inflation rate (*INF*). Therefore, equation (1) becomes:

$$X_t^i = f(MON_t, FIS_t, EXH_t, EG_t, OPNX_t, INF_t) \tag{2}$$

Linearizing equation (2) and introducing constant (β_0) and error term (ε_t) becomes:

$$X_t^i = \beta_0 + \beta_1 MON_t + \beta_2 FIS_t + \beta_3 EXH_t + \beta_4 EG_t + \beta_5 OPNX_t + \beta_6 INF_t + \varepsilon_t \tag{3}$$

Drawing from equation (3) and with respect to the objective of this study which is to examine the impact of macroeconomic policy on unemployment and poverty; this study estimates two different models - unemployment model and poverty model. Therefore, equation (3) is re-written as:

(i) Macroeconomic Policy - unemployment Model

$$UNE_t = \beta_0 + \beta_1 MON_t + \beta_2 FIS_t + \beta_3 EXH_t + \beta_4 EG_t + \beta_5 OPNX_t + \beta_6 INF_t + \varepsilon_t$$
(4)

(ii) Macroeconomic Policy - Poverty Model

$$POV_t = \beta_0 + \beta_1 MON_t + \beta_2 FIS_t + \beta_3 EXH_t + \beta_4 EG_t + \beta_5 OPNX_t + \beta_6 INF_t + \varepsilon_t$$
(5)

Theoretically, it is expected that increase in: monetary policy (proxy by money supply); fiscal policy (proxy by government spending); exchange rate (EXH); economic growth (EG) and trade openness (OPNX) would lead to a decline in unemployment and poverty rates. This indicates that an increase in these variables should lead to a decline in poverty and unemployment rates in Nigeria. With respect to inflation rate it is expected that an increase in inflation rate would result in an increase in unemployment and poverty rates.

3.1 Data Measurement and Sources

Unemployment rate (*UNE*) is measured by the unemployment rate as provided by the National Bureau of Statistics (NBS); the poverty rate (*POV*) is measured by poverty incidence; monetary policy (*MON*) is measured by broad money supply, fiscal policy (*FIS*) is measured by aggregate government expenditure; exchange rate policy (*EXH*) is measured by the average official US Dollar/Naira exchange rate; economic growth (*EG*) is measured by the real gross domestic product; trade openness (*OPNX*) is measured by the ratio of import plus export to real gross domestic product and inflation rate (*INF*) is measured by the annual inflation rate. Data on unemployment rate and poverty rate were obtained from the National Bureau of Statistics while data on monetary policy, fiscal policy, foreign exchange policy, economic growth, trade openness and inflation rate were obtained from the Central Bank of Nigeria (CBN) statistical bulletin, 2014 edition.

4. Regression Estimate on the Impact of Macroeconomic Policies on Unemployment Rate and Poverty Rate in Nigeria

With respect to the regression estimate on the impact of macroeconomic policies on unemployment rate in Nigeria for the period 1980 to 2013, the result is presented on table 2 below. The coefficient of determination (that is R^2) showed that the explanatory variables jointly explained about 92 per cent of variations in unemployment rate in Nigeria during the study period. The F-statistics (54.12; p=0.000) showed that the model estimated is appropriate while the Durbin Watson statistics is 1.75. Furthermore, the regression estimate showed that monetary policy

had an insignificant effect on unemployment rate in Nigeria. However, fiscal policy and exchange rate policy were observed to have significant influence on unemployment rate in Nigeria. This suggests that a unit increase in fiscal policy will reduce unemployment rate by 3.66 per cent while a unit increase in exchange rate policy would positively influence unemployment rate in Nigeria. In a similar fashion, a unit increase in trade openness would unemployment rate in Nigeria. For economic growth and inflation rate, these variables were insignificant in influencing unemployment rate in Nigeria.

Table 2. Regression Estimate on Unemployment Rate and Macroeconomic Policies

Independent Variables	Coefficient	St. Error	t-Statistic
MON	2.2353	2.3252	0.9613
FIS	-3.6551	1.7239	-2.1202
EXH	0.0826	0.0203	4.0658*
EG	0.6664	1.4288	0.4664
OPNX	1.3153	0.5059	2.6002**
INF	-0.0117	0.0232	-0.5044
R-Square	0.9259		
Adj. R-Square	0.9088		
F-Statistics	54.12		
Prob (F-Stat).	(0.000)		
D.W. Statistics	1.75		

Note: * and ** denote 1% and 5% significance level respectively.

On the regression estimate on the impact of macroeconomic policies on poverty rate in Nigeria for the period 1980 to 2013, the result is presented on table 3 below. The coefficient of determination (that is R^2) showed that the explanatory variables jointly explained about 59 per cent of variations in poverty rate in Nigeria during the study period. The F-statistics (6.302; p=0.000) showed that the model estimated is appropriate while the Durbin Watson statistics is 1.92. In contrast to the results from the regression estimate on macroeconomic policies and unemployment rate, table 5 showed that fiscal policy and inflation rate had significant impact on poverty rate in Nigeria. Thus, an increase in government spending reduces poverty rate in Nigeria while and increase in inflation rate escalates the poverty rate. Besides these two variables, other variables in the model had insignificant influence on poverty rate in Nigeria.

Table 3. Regression Estimate on Macroeconomic Policies and Poverty Rate

Independent Variables	Coefficient	St. Error	t-Statistic
MON	-7.3972	11.6567	-0.6346
FIS	-0.0524	0.0122	-4.2592*
EXH	0.0304	0.1019	0.2988
EG	3.3096	7.1627	0.4620
OPNX	-1.1431	2.5360	-4.4507
INF	0.4290	0.1297	3.3081*
R-Square	0.5925		
Adj. R-Square	0.4985		
F-Statistics	6.3010		
Prob (F-Stat).	(0.000)		
D.W. Statistics	1.92		

Note: * denotes 1% significance level.

5. Conclusion and Policy Recommendation

This study examined the impact of macroeconomic policy (monetary, fiscal and foreign exchange policy) on unemployment and poverty rates in Nigeria for the period 1980 to 2013 with implication to achieving inclusive growth. Utilizing the Ordinary Least Square technique, the study observed that fiscal policy and exchange rate policy significant influenced unemployment rate with fiscal policy having the most significant effect while fiscal policy and inflation rate influenced poverty rate in Nigeria. With respect to the focus of this study, it was discovered from the empirical analysis that fiscal policy, exchange rate policy and inflation rate significantly influenced unemployment poverty rates in Nigeria. Therefore, to achieve inclusive growth there is the need for fiscal and exchange policies to be prudently utilized to further reduce unemployment rate. Specifically, fiscal policy needs to focus on the development of productive-infrastructural facilities that are capable of enhancing production and employment opportunities. There is also the need for fiscal policy to focus on the development of the growth of the non-oil sector (such as the agricultural sector) which possesses the great employment opportunities for the rising unemployment rate in Nigeria. In addition to ensuring growth inclusiveness, at the grassroots level (that is at the local government level) there is the need for the development entrepreneurial and skill acquisition centers; and

development of industrial estate with modern production infrastructural amenities, which will enable trained entrepreneurs to carry out productive activities. The development of industrial estate at the local level will create a linkage to the agricultural sector. This will also create more employment and business activities at the local government levels. Monetary policy needs to re-examine particularly in the areas of interest management that can enhance the growth of the non-oil sector by providing loans with reduced interest rates to investors. Furthermore, much is needed to be done in the areas of the growth of Small and Medium Scale Enterprises (SMEs) given the importance of this sector in the attainment of inclusive growth as evident in Asian countries like Japan and China. Still in the area of SMEs, there is the need for the Bank of Industries (BOI) with collaboration with the Central Bank of Nigeria (CBN) in the provision of long term and affordable loans that can enhance the growth of the SMEs sector. These measures will lead to reduction in unemployment rate; and given the link between unemployment and poverty rate, it is believed that the expected reduction in unemployment rate will culminate into declined in poverty rate in Nigeria.

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The Macroeconomic Impact of Ebola Virus Disease (Evd): A Contribution to the Empirics of Growth

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Abstract: The paper addressed the formulation of a macro model to capture the macroeconomic impact of the Ebola Virus Disease (EVD). Previous studies has adopted various models such as the dynamic computable general equilibrium (CGE) model, endogenous model and the LINKAGE model, but there is dire need to generate a step-by-step model which will comprehensively capture how the Ebola Virus Disease (EVD) impacts on macroeconomic variables. Adopting the traditional neoclassical growth model, the model aggregated the various macroeconomic variables as well as captured the epidemic's strain on each of these variables. The paper also empirically shows that the Ebola Virus Disease (EVD) has direct, indirect and deferred indirect cost implications for the economy. Using case studies of countries in Africa, the study evaluated how the Ebola Virus Disease (EVD) has affected the macroeconomic status of selected economies. The findings imply that there is dire need to control the spread of the deadly plague. The paper contribute immensely to empirical studies in the field of macroeconomics.

Keywords: neoclassical growth model; macroeconomic; framework; steady state; computable general equilibrium; Ebola virus disease

JEL Classification: C51; H51; I32

1. Introduction

The Ebola virus has continued to send tremor down the spines of economies not only in Africa, but also in Europe, Asia and the Americas. Its spread has been rapid, defiling preventive measures and moving without constraints across national borders, though the scourge started in West Africa (Guinea). Worst of all, the human death toll has been terrible. OCHA (2014a) reported that as of September 10, 2014, there had been 2,281 recorded deaths out of 4,614 suspected or confirmed cases of Ebola in across Guinea, Liberia, Nigeria, Senegal and Sierra Leone, with fear that these figures were under-reported as in the cases of victims who died in isolation taking treatment in hiding. For instance, there was the case of a medical doctor who died in Port Harcourt, Nigeria of Ebola virus while treating victims of the disease in secret. The fatality rate has continued to grow exponentially. The Ebola epidemic

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currently afflicting West Africa is now a global issue. Macroeconomic effects are now felt in terms of forgone productivity of those directly affected; higher fiscal deficits; rising inflation; lower real household incomes and greater poverty (World Bank, 2014). This trend is expected to linger for a longer duration even after laudable improvement in the eradication of the deadly disease. (*The Economist*, 2015)

A lot of emphasis has been placed on health-related impacts of Ebola Virus Disease (EVD) with little efforts dedicated to the macroeconomic impacts of the Ebola Disease on an economy. The thrust of this paper is to analyze the macroeconomic impacts of the disease using a typical growth model. Following the introductory section, Section 2 develops a macroeconomic model to capture the impacts of the deadly Ebola. Sections 3 and 4 examine empirical findings and concluding remarks respectively.

2. The Model

The theoretical framework of the study is based on the modifications of the Solow-Swan (1956) standard neoclassical growth model. It is expressed below;

$$Y_{it} = R_{it}^{\emptyset} K_{it}^{\varphi} H_{it}^{\theta} [A_{it} N_{it}]^{1-\emptyset-\varphi-\theta-\alpha} \tag{1}$$

Where

Y = measure of output per unit of effective labour

R = measure of Research & Development

K = physical capital

H = health human capital

A = technologies and institutions

N = total population

The exponents θ, φ, α and ϕ represent the factor shares. The subscripts i denotes economy (i) and t implies time.

Assumption I

A fundamental assumption underlying equation (1) is that population grows at the economy-specific rate n_i, A_{it} grows at a rate of g_{it} and all capital stocks depreciate at a constant rate of δ. Equation (1) can be written in an intensive form as

$$y_{it} = r_{it}^{\emptyset} k_{it}^{\varphi} h_{it}^{\theta} e_{it}^{\alpha} \tag{2}$$

Where

$$\text{effective output per unit of capital (y)} = \frac{Y}{AN}$$

$$\text{physical capital per capita (k)} = \frac{K}{AN}$$

$$\text{research \& development capital per capital (r)} = \frac{R}{AN}$$

$$\text{education human capital per capital (e)} = \frac{E}{AN}$$

$$\text{health human capital per capital (h)} = \frac{H}{AN}$$

Assumption II

We assume that the savings in the economy are distributed among physical capital, research and development (R & D), health human capital and education human capital, such that the economy wide savings and investment are distributed among all the capital stocks. This is clearly shown below;

$$s_{it} = s_{it}^r + s_{it}^k + s_{it}^h + s_{it}^e = \frac{S_{it}}{Y_{it}} = \frac{I_{it}}{Y_{it}}$$
$$= \frac{I_{it}^r + I_{it}^k + I_{it}^h + I_{it}^e}{Y_{it}} \tag{3}$$

Where

s_{it} = economy wide savings and investment

s^r_{it} = saving rate for research and development in economy in economy i at time t.

s^k_{it} = saving rate for physical capital in economy in economy i at time t.

s^h_{it} = saving rate for health human capital in economy in economy i at time t.

s^e_{it} = saving rate for education human capital in economy in economy i at time t.

The rates of research and Development (R & D), physical, education and health capital growth per unit of labour are defined below:

$$\dot{r}_{it} = s_{it}^r y_{it} - r_{it}(n_{it} + g_{it} + \delta_{it}) \tag{4}$$

$$\dot{k}_{it} = s_{it}^k y_{it} - k_{it}(n_{it} + g_{it} + \delta_{it}) \tag{5}$$

$$\dot{h}_{it} = s_{it}^h y_{it} - h_{it}(n_{it} + g_{it} + \delta_{it}) \tag{6}$$

$$\dot{e}_{it} = s_{it}^e y_{it} - e_{it}(n_{it} + g_{it} + \delta_{it}) \tag{7}$$

Assumption III

The Ebola Virus Disease (EVD) is assumed to be introduced into the neoclassical growth model as a distortion or disturbance to economic growth path. Population growth is allowed to change over time due to EVD-related deaths. If the population growth varies, then we will obtain;

$$\dot{n} = \xi^n\big[n_t - (n^* - a^{n^*})\big] - a_{it}^n \tag{8}$$

Where

a_t^n = mortality shock resultant from the initial effect of the Ebola Virus Disease

$a_t^{n^*}$ = permanent effect of the epidemic on the population growth

ξ^n = persistent effect of the epidemic on the population growth ($\xi < 0$)

$(n^* - a^{n^*})$ = steady state growth reached only in the long run when the epidemic is over.

From equation (8), the impact of the Ebola Virus Disease (EVD) on savings rates and investment as they relate to R & D, education and health capitals can be expressed as:

$$\dot{s}^k = \xi^k\big[s_t^k - (s^{k^*} - a^{k^*})\big] - a_t^k \tag{9}$$

$$\dot{s}^{rd} = \xi^{rd}\big[s_t^{rd} - (s^{rd^*} - a^{rd^*})\big] - a_t^{rd} \tag{10}$$

$$\dot{s}^h = \xi^h\big[s_t^h - (s^{h^*} - a^{h^*})\big] - a_t^h \tag{11}$$

$$\dot{s}^e = \xi^k\big[s_t^k - (s^{k^*} - a^{k^*})\big] - a_t^k \tag{12}$$

The parameters a_t^k, a_t^{rd}, a_t^h and a_t^e are the shocks of the EVD; a^{k^*}, a^{rd^*}, a^{h^*} and a^{e^*} are the permanent impact of the disease on each variable while ξ^k, ξ^{rd}, ξ^h and ξ^e are less than zero. Each of them represents EVD persistent shocks on each of the variables of interest. The long run steady state values of savings allotted to physical, health, education and R & D investment are $(s^{k^*} - a^{k^*})$, $(s^{h^*} - a^{h^*})$, $(s^{e^*} - a^{e^*})$ and $(s^{rd^*} - a^{rd^*})$ respectively.

The steady state values of the capital stocks for economy i at time t converge to the expression given below;

$$r_{it}^* = \left[\frac{(s_i^r)^{1-\varphi-\theta-\alpha}(s_i^k)^{\varphi}(s_i^h)^{\theta}(s_i^e)^{\alpha}}{n_i^* - a^{n^*} + g_{it} + \delta} \right]^{\frac{1}{1-\varphi-\theta-\alpha-\phi}} \tag{13}$$

$$k_{it}^* = \left[\frac{(s_i^r)^{\phi}(s_i^k)^{1-\phi-\theta-\alpha}(s_i^h)^{\theta}(s_i^e)^{\alpha}}{n_i^* - a^{n^*} + g_{it} + \delta} \right]^{\frac{1}{1-\phi-\theta-\alpha-\varphi}} \tag{14}$$

$$h_{it}^* = \left[\frac{(s_i^r)^{\phi}(s_i^k)^{\varphi}(s_i^h)^{1-\phi-\varphi-\alpha}(s_i^e)^{\alpha}}{n_i^* - a^{n^*} + g_{it} + \delta} \right]^{\frac{1}{1-\phi-\varphi-\alpha-\theta}} \tag{15}$$

$$e_{it}^* = \left[\frac{(s_i^r)^{\phi}(s_i^k)^{\varphi}(s_i^h)^{\theta}(s_i^e)^{1-\phi-\varphi-\theta}}{n_i^* - a^{n^*} + g_{it} + \delta} \right]^{\frac{1}{1-\phi-\varphi-\theta-\alpha}} \tag{16}$$

The steady state values of R & D, physical, education human and health human capital expressed in the above equations depict their growth behaviors with implicit implications for a number of factors including n^*, a^{n^*} and y_{it}. The growth behaviors of the capital stocks as shown in equations 13-16 are complex. The complexity of each of the above equations is predicted on the fact that all the other capital stocks' growth behaviors are implicated in the growth behavior of each capital stock. In other words, a distortion or shock to a capital stock is a shock to all. Shocks are automatically transmitted through the general economy. The systematic interrelationship and interdependence among the capital stocks in terms of growth performances in the presence of the deadly disease Ebola is the starting point of the analysis of Ebola Virus Disease macroeconomic impact on an economy.

The steady state values of R & D, physical, education and health capital depicted in equations 13-16 are substituted into equation (2) to obtain the steady state output per capita. The resulting equation is shown below:

$$y_{it}^* = \left[\frac{(s_i^r)^{\phi}(s_i^k)^{1-\phi-\theta-\alpha}(s_i^h)^{\theta}(s_i^e)^{\alpha}}{n_i^* - a^{n^*} + g_{it} + \delta} \right]^{\frac{1}{1-\phi-\theta-\alpha-\varphi}} \tag{17}$$

Where

Y_{it}^{*} = steady state output per capita

Equation (17) is a very complex form of the extended neoclassical production function. The equation portrays the impacts of Ebola Virus Disease (EVD) within neoclassical model. EVD is expected to negatively affect output per capita such that its impact reduces savings and investment rates. This effect is contagious since it is automatically felt in the whole economy.

Within the framework of the Solow-Swan neoclassical model, equation (17) is the fundamental framework for understanding the complexity of the macroeconomic impact of the Ebola Virus Disease (EVD) on the growth of an economy.

In order to accommodate the impact of EVD on specific economies (such as Sub Saharan Africa, Europe etc) there is need to transform the Solow-Swan neoclassical function levels into growth model using the process given by Mankiw, Romer and Weil (1992).

Taking the logs of equations 13-16, we arrive at the following;

$$\ln r_{it}^{*} = \frac{1}{(1-\phi-\varphi-\alpha-\theta)}\Big[\ln\big((s_i^r)^{1-\varphi-\theta-\alpha}(s_i^k)^{\varphi}(s_i^h)^{\theta}(s_i^e)^{\alpha}\big)$$
$$- \ln(n_i^* - a^{n^*} + g_{it} + \delta)\Big] \quad (18)$$

$$\ln k_{it}^{*} = \frac{1}{(1-\phi-\varphi-\alpha-\theta)}\Big[\ln\big((s_i^r)^{\phi}(s_i^k)^{1-\phi-\theta-\alpha}(s_i^h)^{\theta}(s_i^e)^{\alpha}\big)$$
$$- \ln(n_i^* - a^{n^*} + g_{it} + \delta)\Big] \quad (19)$$

$$\ln h_{it}^{*} = \frac{1}{(1-\phi-\varphi-\alpha-\theta)}\Big[\ln\big((s_i^r)^{\phi}(s_i^k)^{\varphi}(s_i^h)^{1-\phi-\varphi-\alpha}(s_i^e)^{\alpha}\big)$$
$$- \ln(n_i^* - a^{n^*} + g_{it} + \delta)\Big] \quad (20)$$

$$\ln e_{it}^{*} = \frac{1}{(1-\phi-\varphi-\alpha-\theta)}\Big[\ln\big((s_i^r)^{\phi}(s_i^k)^{\varphi}(s_i^h)^{\theta}(s_i^e)^{1-\phi-\varphi-\theta}\big)$$
$$- \ln(n_i^* - a^{n^*} + g_{it} + \delta)\Big] \quad (21)$$

Substituting equation 18-21 into the augmented steady state of output per capita depicted in equation (17) gives;

$$ln\,y_{it}^* = \frac{\phi}{(1 - \phi - \varphi - \alpha - \theta)}\,ln(s_i^r)$$
$$+ \frac{\varphi}{(1 - \phi - \varphi - \alpha - \theta)}\,ln\!\left(s_i^k\right) + \frac{\theta}{(1 - \phi - \varphi - \alpha - \theta)}\,ln\!\left(s_i^h\right)$$
$$+ \frac{\alpha}{(1 - \phi - \varphi - \alpha - \theta)}\,ln(s_i^e) - \frac{\phi + \varphi + \theta + \alpha}{(1 - \phi - \varphi - \alpha - \theta)}\,ln(n_i^*$$
$$- a^{n^*} + g_{it} + \delta) \quad (22)$$

In equation (22), s_i^r, s_i^k, s_i^h and s_i^e represent the proportion of savings rates deployed to R & D, physical capital, health capital and education capital. If equation (22) is linearised, then we will obtain;

$$\frac{d\,ln\,y_{it}}{dt}$$
$$= \mu(ln\,y_{it}^*$$
$$- ln\,y_{it}) \hspace{4cm} (23)$$

Where

$\mu = (n_i^* - a^{n^*} + g_{it} + \delta)(1 - \phi - \varphi - \alpha - \theta)$ and y_{it} is representative of the level of output per capita in economy i at time t. If the differential equation is solved, the equation below is expressed:

$$ln\,y_{it} = (1 - exp^{-\mu t})\,ln\,y_{it}^* + exp^{-\mu t}\,ln\,y_{i0} \hspace{2cm} (24)$$

In equation (24), y_{i0} denotes initial income in the economy (i). The change in income from the initial time (t) is obtained by subtracting y_{i0} from both sides of equation (24) and substituting into the equation for steady state output per capita. The resultant equation is shown below;

$$ln\,y_{it} - ln\,y_{i0} = (1$$
$$- exp^{-\mu t})\frac{\phi}{1 - \phi - \varphi - \alpha - \theta}\,lns_i^k + (1$$
$$- exp^{-\mu t})\frac{\alpha}{1 - \phi - \varphi - \alpha - \theta}\,lns_i^e + (1 - exp^{-\mu t})\frac{\theta}{1 - \phi - \varphi - \alpha - \theta}\,lns_i^h$$
$$+ (1 - exp^{-\mu t})\frac{\varphi}{1 - \phi - \varphi - \alpha - \theta}\,lns_i^{rd}$$
$$- (1 - exp^{-\mu t})\frac{\phi + \varphi + \alpha + \theta}{1 - \phi - \varphi - \alpha - \theta}\,ln(n_i^* - a^{n^*} + g_{it} + \delta)$$
$$- (1 - exp^{-\mu t})lny_{i0} \hspace{2cm} (25)$$

Equation (25) thus constitutes the macroeconomic framework on which the impact of Ebola Virus Disease (EVD) can be accessed in an economy.

3. Empirical Findings

Various studies have attempted to analyze the macroeconomic impact of the Ebola Virus Disease. Such a task is not easy. However, there are majorly four contributions in this regard. (World Bank, 2014; UNECA, 2014; UNDP-RBA, 2014; and UNDP-RBA, 2015)

In general, the Ebola Virus Disease epidemic will affect the economy via three channels. (World Bank, 2014) These channels are direct, indirect and deferred indirect costs. World Bank (2014) opined that the direct costs are mostly medical expenditures which are incurred due to the disease at the macro level. For instance, if a family is struck by the virus, the use of family savings for health care is considered a direct cost. Savings meant for family day-to-day economic activities are expended on the victim(s) leaving the family impoverished as seen in many households affected by the disease.

Indirect costs are closely related to economic productivity. Losses in economic activities due to reduction of productivity caused by deaths of some dramatis personae in an economy. While, deferred indirect costs are the costs that households or the general economy will have to pay in the absence of external aid. In with this, OCHA (2014) stated that the financial resources involved has four strategic objectives; stop the outbreak, treat the infected, ensure essential services, and preserve stability. Such a situation will shake in no small measure the economic structure of the economy due to its capital implications.

The World Bank using a dynamic computable general equilibrium (CGE) model estimated the medium term impacts of Ebola Virus Disease in growth rates in Liberia, Guinea and Sierra Leone. The estimated result shows that Liberia is the most affected country in terms of poverty. Prior to the Ebola Virus Disease outbreak is already at 83.3 percent in 2011. (World Bank, 2014) However, in 2014, the poverty rate is estimated to have been 5.46 percent higher in the low Ebola scenario and 5.89 percent higher in the high Ebola scenario, both relative to the baseline (no Ebola). The results showed that the poverty rate in Guinea in 2014 increased from 2.25 to 2.65 percent relative to the baseline for the low and high Ebola scenarios, respectively. In spite of economic policy thrusts employed 2015 to revamp the economy, the economy of Guinea still remains incapacitated to reduce poverty. The disease also critically affected poverty in Sierra Leone. (UNDP, 2015)

It is noteworthy to stress that the above estimates are tentative and with the souring and exponential increase in the outbreak of the epidemic, the financial requirements must have exploded drastically. The situation is complicated with economic burdens of bearing up foreign medical teams, medical evacuation, human resources (technical and operational staff) and material supports in terms of relief materials. There is thus an urgent need to curb the virus spread and reestablish stability and confidence.

4. Concluding Remarks

The analysis so far has established the fact that the Ebola Virus Disease (EVD) has adversely affected the macroeconomic status of various economies. Ranging from its impact on investments on infrastructural project to savings, the disease has and will continue to ravage societies even those in advanced nations. There is thus urgent need to address the situation and curb the menacein order to reestablish confidence through eradication of macroeconomic misalignments.

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Foreign Direct Investment-Economic Growth Nexus

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Abstract*:* In this paper investigates the relationship between foreign direct investment and economic growth. On the one hand the effect of FDI on the economies of the MENA region, and, on the other hand, the impact of the economic growth of these countries on the attractiveness of FDI. Our objective, in this study, is to investigate the interrelationships between economic growth and FDI by using panel data models with simultaneous equations by Generalized Method of Moments (GMM) for the period 1998-2011. Our results show that there is bidirectional causality between economic growth and FDI. This implies that economic growth and FDI attractiveness are complementary. These empirical perspectives are particularly attractive to politicians because they help them build sound economic policies to sustain economic development and improve their level of attractiveness. This study aims to contribute to the exiting literature by determining the relationship between FDI and growth by three aspects: Firstly, few scientific papers treat this relationship only in the theoretical framework. Secondly, few scientific papers treat this relationship in the MENA region. Finally, previous studies had found that the nexus FDI-growth is mixed.

Keywords: Economic growth; FDI inflows; simultaneous equations models

JEL Classification: B22; C36; E22; F63

1. Introduction

Over the past two decades, increased globalization has generated strong growth in international activity and FDI. Developing countries are opening more and more financial flows and international exchanges in order to improve their growth and economic development and combat the challenges of this openness while producing an environment adapted to global competition in order to attract more foreign investment. FDI can active contribute to economic growth not only through capital inflows for the host countries, but also though technological contributions and expertise as well as access to new markets. These advantages conveyed by FDI often known as spillovers are linked to each other, and complementary, there are they should not be considered separately. Indeed, the gain generated by the FDI on a the

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growth factor can stimulate the development of other factors, increase the production rate, expand the volume of exports, and increase employment opportunities (Bende et al. 2003; Zhao and Du, 2007; Mastromarco, 2008; Christova-Balkanska, 2009; Lee and Chang, 2009; Vadlamannati and Tamazian, 2009; Bajo-Rubio et al. 2010; Soltani and Ochi, 2012).

In this context, a rich theoretical and empirical literature, which seeking to persuade the theoretical benefits of FDI on the economy of each country has expanded in recent decades (MacDougall, 1960; Bornschier et al. 1978; Grossman and Helpman, 1991; Borensztein, Lipsey and Zejan, 1992; De Gregorio 1993; Borensztein, De Gregorio and Lee, 1998 ; Berthelemy and Demurger, 2000; Choe, 2003; Güner and Yılmaz, 2007; Massoud, 2008; Tiwari and Mutascu, 2010; Rogmans, 2011; Adeniyi et al. 2012).

The results found out by different authors are mixed. Some showed that there was no positive relationship between FDI and economic growth (Bornschier et al 1978; Aitken and Harrison 1999; Bashir, 2001; Alfaro et al 2002; Effendi et al 2003; Carkovic and Levine 2005; Meschi, 2006; Massoud 2008). However, others found that FDI positively and significantly affects economic growth (Fry 1993; Obwana 1996; De Mello 1999; Zhang 2001; Bengoa et al 2003; Basu and Guariglia 2007; Türkcan et al 2008; JyunYi and Chih-Chiang 2008; Vu et al., 2008; Adams 2009; Wang, 2009; Anwar and Sun 2011; Agrawal and Khan 2011; Soltani et Ochi 2012; Adeniyi et al 2012; Belloumi 2014). *They actually, identified the conditions that can help developing countries make full use of the, FDI potential benefits.*

In this article, we analyzed the nature of the relationship between FDI and economic growth to see if it is important or not for the MENA region. The rest of the study is structured as follows: we will discuss the literature on FDI-economic growth relationship; then approach the main literature analysis problems. Finally, we will present the methodological structure of the study and the conclusion.

2. Literature Review

2.1. Theoretical Aspects

Like any other investment, FDI result in a capital contribution. In fact, next to labor and land, Smith (1976) deals with the accumulation of capital as a source of economic growth. In addition, the multiplier theory of Keynes (1936) proved that additional investment produces a multiplied effect on the level of production and employment.

The theories that treat FDI flows can be classified into three schools. For the school of dependence, foreign investment brings more disadvantages than advantages, and exhibits more negative than positive effects but only intensifies underdevelopment.

The modernization school (Saskia Wilhelms, 1998) considers FDI as a prerequisite and a catalyst for growth and sustainable development. Finally, the integration school or electrical theory of John H. Dunning (1980), which shows that three simultaneous benefits such as; volume, distribution and international structure of production of a multinational business depends on three main factors. They are the company's specific advantages (O = Ownership), its location in some countries (L = Location) and the internalization of transactions within the company (I = internalization) which are necessary for the foreign investment to be realized.

Regarding the neoclassical theory, the first theories of economic growth (Smith, 1776; Robert, 1798, Ricardo, 1817) emphasized the importance of the quantitative expansion of the production factors namely: capital and labour, the role of market growth in improving the efficiency and productivity of an economy, and the role of demand and multiplier effects of the increase in investment and exports. However, the assumption of diminishing returns to scale in the capital of Solow (1956) shows that the increase in the income per capital has an effect in the short term and the long-term growth rate which remains unchanged. Then, the limit of the neoclassical model is that it cannot account for the actual dynamics of the developed capitalist countries. In this way, the FDI will affect economic growth only in the short term, due to the fact that the law of diminishing returns to scale regarding FDI capital does not affect economic growth.

2.2. Empirical Aspects

In theory, there are several attempts to explain economic growth variables. As part of this article we have chosen FDI flows among these variables. In addition, empirically, these attempts to explain economic growth are numerous. For example; Seetanah et al. (2005) analyzed the impact of FDI on economic growth in 39 countries in sub-Saharan Africa using panel data for the period 1980-2000 using the Cobb-Douglas production function. The study found that FDI is a crucial part of the economic issue in the countries of sub-Saharan Africa. Moreover, a positive link is confirmed by the dynamic panel GMM estimation method. Ilhan et al. (2007) studied the impact of FDI on economic growth of Turkey and Pakistan during the 1975-2004 periods using the Granger causality technique. They found that the increase in GDP is caused by FDI in the case of Pakistan, while there is evidence of bidirectional causality between FDI and GDP in the context of Turkey. Remaining in the same wave, Sridharan et al. (2009) analyzed the causal relationship between FDI and economic growth in the BRICS countries during different periods using the (VECM) method.

The results suggest that there was a two-way causality between FDI and GDP for Brazil, Russia and South Africa, besides, FDI caused economic growth in India and China. Furthermore, through methods of simultaneous equations, Ruxanda Muraru

(2010) found evidence of a bidirectional link between both countries, which means that FDI inflows stimulate economic growth and, higher GDP attracts more FDI.

Nguyen and Nguyen (2007) identified two connection paths between FDI and economic growth in which FDI promotes economic growth and, in turn, economic growth is seen as a tool to attract FDI.

Moreover, in their study, Agrawal and Khan (2011) indicate that economic development depends on a favorable economic climate for their realization. In the absence of such a climate, the FDI can be against-productive and can frustrate rather than promote economic growth.

Turkcan et al. (2008) tested the endogenous relationship between FDI and economic growth using a panel data set for 23 OECD countries for the period 1975-2004. They declared that FDI and growth are mutually important determinants.

Nicet-Chenaf and Rougier (2009) studied the interactions between FDI and growth in a number of countries in the MENA region using a panel data model. Their results showed that FDI has no significant direct effect on economic growth, but plays an indirect role in growth through its positive effects on the formation of human capital and international integration. They explained these results by the relative weakness of FDI in these countries, which hinders the positive impact of FDI on growth.

Hossain and Hossain (2012) examined the causal relationship between FDI and GDP for Bangladesh, Pakistan and India in the period 1972-2008. The Granger causality results indicate that there is no causal relationship between GDP and FDI for Bangladesh and a unidirectional relationship found for Pakistan and India.

Tintin (2012) examined the extent to which FDI stimulates economic growth taking into account the level of development and the quality of the host country institutions using a panel data model with fixed effects for a sample of 125 countries for the period 1980-2010. The author used the index of economic freedom for the proxy of the quality of institutions in the host country. He found that FDI promotes economic growth both in developed and developing countries.

However, the significance of the effects of FDI on economic growth is not uniform in all the groups of countries. The index of economic freedom had a positive and significant effect on economic growth, which implies the importance of high-quality institutions for economic development.

On the other hand, Brewer (1991) showed that the relationship between FDI and economic growth is negative, which could be due to the lack of motivation of local enterprises to develop because of the preponderance of foreign companies.

However, others cannot find any influence of FDI on economic growth. This was proven, for example, by Crankovic and Levine (2000) using a panel of 72 countries

for the period between 1960 and 1995.

Like this work, it turns out that the studies that have been conducted to explain the relationship between economic growth and foreign direct investment are inconclusive. Nevertheless, one has the feeling that there is a tendency to authenticate the positive relationship between these two variables.

2.3. FDI flow to MENA countries

The link between foreign investment and economic growth has been a subject of great academic research in recent decades (Borensztein et al. 1998; Anwar and Sun, 2011; Soltani and Ochi, 2012) foreign direct investment (FDI) is a means of stimulating economic growth (Adams, 2009). Moreover, it allows human freedoms averaging peaceful and profitable exchanges and enhances (Chauffour 2011).

Similarly, Neuhause (2006) shows that there are three main channels through which FDI can influence technological change, improve capital stocks and boost economic growth. In addition, Ögütçü (2002) argues that FDI is a major catalyst for the development and integration of developing countries into the world economy. In general, the positive role of FDI on development is well documented. According for Chen (1992), FDI has a positive effect on economic growth in the host countries.

According to the OECD (2011), FDI can have more rapid effects on growth and job creation. The massive popular uprisings in Tunisia, Egypt, Libya, Syria and other parts of the Arab world are the latest manifestations of this universal quest for freedom. The figure (1) below shows that there are some improvements and increasing of FDI inflows in the MENA region. As seen on the chart, there is a slight increase in FDI inflows in this area during the 1980-2002 periods. However, the total amount of FDI received by the countries in the MENA region during the period 2002-2011 increased by more than five times, from 100,000.00 million in 2002 to over 700,000.00 million US dollars in 2011. In absolute terms, FDI in the MENA region is small but could nevertheless have a greater impact on the economies of these countries.
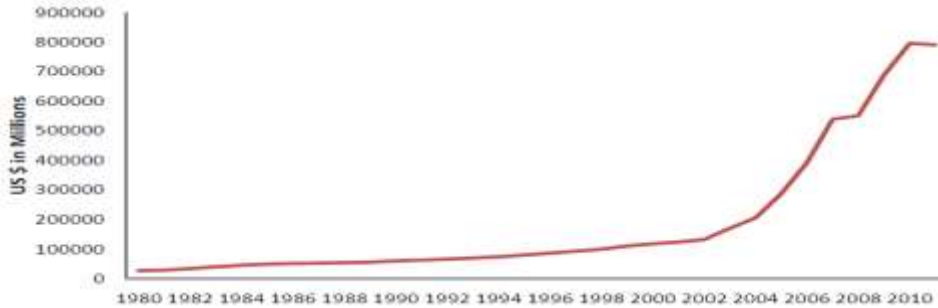
Figure 1. FDI Trends in MENA "1980-2011"

Source: http://unctadstat.unctad.org

3. The Estimation Method

We build a model consisting of two equations. The first explains economic growth (Barro, 2001; Borenztein et al. 1998), where the second explains the FDI (Forbes, 2000; Deininger and Squire, 1998 and Lyn Squire, 2003). These two equations are estimated by two-step GMM estimator. At the first step, we estimated the dependent variable of real GDP determinants, namely CPI, human capital, physical capital, working capital and instrumented the explanatory variable FDI instrumental variables are inflation, energy and institutional quality.

The second step, where the dependent variable is the FDI is explained by the variables, namely: inflation, energy, institutional quality and instrumenting the real GDP variable determinants that are written above.

The two links of paths between these variables are examined empirically using the following two simultaneous equations:

$$\ln GDP_{it} = \alpha_i + \beta_1 \ln H_{it} + \beta_2 \ln L_{it} + \beta_3 \ln K_{it} + \beta_4 CPI_{it} + \beta_5 \ln FDI_{it} + \mu_{it} \qquad (1)$$

$$IDE_{it} = \alpha'_i + \delta_1 \ln GDP_{it} + \delta_2 \ln IFLATION_{it} + \delta_3 \ln ENERG_{it} + \delta_4 IQ_{it} + \varepsilon_{it} \qquad (2)$$

The index i = 1.....N denotes the country and t = 1 ......T is the period of time.

4. Empirical Results

The objective of this part is to investigate the direction of economic growth and FDI in 12 countries in the MENA region. To do this, we used the instrumental method dual stage GMM (2SLS).

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Table 1. System of simultaneous equations using two-stage least squares (2SLS), 1998–2011

	Eq. (1)	Eq. (2)
	Dependents variables	
	Economic growth	FDI
GDP		5.391749
		(0.000) ***
FDI	0.304823	
	(0.000) ***	
CPI	-0.2474602	
	(0.034) **	
Inflation		-0.0025896
		(0.963)
Ln(ENERG)		0.4734352
		(0.106)
IQ		2.332495
		(0.000) ***
Ln(K)	0.5858332	
	(0.116)	
Ln(L)	1.687198	
	(0.060) *	
Ln(H)	1.274522	
	(0.000) ***	
Hansen test	0.659	3.343
	(0.7194)	(0.3418)
DWH test	80.745	25.508
	(0.0000)	(0.0000)

Notes: The coefficient is indicated by the numbers above. The probability is in brackets. Hansen test refers to the over-identification test for the restrictions in GMM estimator. DWH test is the Durbin-Wu-Hausman for endogeneity test.

* Indicates significant at 10% level. ****** Indicates significant at 5% level**. ***** Indicates significant at 1% level**.**

The second column of Table 1 provides us with the results of the estimation of equation 1 that studies the impact of FDI, as well as traditional factors of production (human capital, physical capital, labor, capital) and corruption on economic growth.

Beginning with the first equation, the FDI variable measured by (foreign direct investment, net inflows (% of GDP)) has a positive and significant impact on real GDP as shown in the table above. The positive sign of this relationship is justified by the importance of foreign direct investment by the transfer of skills and technology from foreign firms as well as capital inflows to the host country and access to new markets, which stimulates economic growth. This is affirmed by Borensztein et al. (1998) find that foreign direct investment can be an important tool for the transfer of contemporary technology. As a result, the MENA region will be

encouraged to focus on policies that promote the attractiveness of this type of investment to become an attractive destination for FDI.

This result corroborates those of (Soltani and Ochi (2012); Anwar and Sun (2011), Adams (2009), Belloumi (2014)), but it is in opposition with those of others who found that FDI can negatively affect economic growth (Balasubramanyam et al (1996). Lipsey (2000), De Mello (1999), Xu (2000)). Based on the results of Blomström et al. (2000), the experience of many countries shows that a significant amount of FDI alone is not sufficient to generate economic growth and economic prosperity in a host country. Boyd and Smith (1992) see that because of the misallocation of resources or some distortions that exist in trade, foreign direct investment can negatively affect economic growth. However, several work, such as those of (Meschi, 2006. Bashir, 2001) showed that there is no significant relationship between FDI and economic growth.

Our results show that the variable of human capital, which is approximated by enrollment in secondary schools, is important in determining growth. Our results confirm those of several empirical studies demonstrating the importance of this factor (Barro, 1991; Levine & Renelt, 1992; Mankiw et al. 1992, Fleisher and Chen, 1997; Wang and Yao, 2003; Altinok, 2006; H. Li & Huang, 2009; Li and Liu, 2011).

This also reinforces the idea of Krueger and Lindahl (2001) is that human capital is related to the growth of positive and significant for countries that have low levels of education. According to Becker, there is "a strong causal relationship between better education and human capital and economic growth. This relationship of cause and effect also exists between economic growth and development "(Keeley, 2007).

The variable of corruption (CPI) has a significant negative impact on economic growth of our sample. Indeed, the negative impact of the rise of corruption on economic growth may be due to the importance of corruption in the countries of the MENA region that undermines a just and stable governance and leads to a lower quality of public services. This result reinforces the idea of Avnimelech and Zelekha (2011), Dzhumashev (2009), and Blackburn et al. (2008) that corruption leads to an increase in inflation, which in turn reduces capital accumulation and economic growth.

Similarly, Gerlagh Pellegrini (2004) studied the effect of corruption on economic growth, directly and through its impact on investment, schooling, trade openness and political instability. Their results show that corruption has a negative effect on economic growth.

Moreover, Tanzi and Davoodi for (2000), Johnson, and LaFountain Yamarik (2011), corruption undermines growth because it has a negative impact on the quantity and quality of public investment. It erodes the efficiency of public investment decisions, particularly because it induces a preference for larger projects likely to generate

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substantial private gains for policymakers. Oludele and Rano (2008) studied the effect of corruption on economic growth in Nigeria for the period 1986 to 2007. They sought to show that corruption can affect economic growth through three channels: expenses on government's investment, the development of human capital and employment. They showed that corruption has a negative and significant effect on human capital and employment, but it has a positive impact on public investment spending. The authors also directly tested the relationship between corruption and economic growth and found that this relationship is negative. Such results support good governance reforms (Seligson, 2002), the recommendation is not to spend more but to reduce corruption to avoid the relative shortage of resources in some areas of the administration.

In the second equation, the variable of real GDP reflecting the country's economic growth is positive and statistically significant. This result is consistent with previous studies (Hejazi, 2009; Medvedev, 2012; Kahouli & Kadhraoui, 2012), which confirmed that the GDP of host countries attracts FDI.

For institutional and business profile of the countries studied, the variable institutional quality (IQ) is the six ACP institutional variables (Representation and participation, political stability and absence of violence, government effectiveness, regulatory quality, Rule of Law, Corruption control) Kaufman et al. (2011) of the WGI database. Adequate institutional environment would positively on the attractiveness of FDI. Institutional development is therefore considered as a direct determinant of FDI and as an indirect determinant of economic growth.

5. Conclusion and Recommendations

The main findings for 12 countries in the MENA region for the period 1998-2011 show signs of bi-directional causality between economic growth and FDI flows. The presence of bidirectional and positive causal relationship between FDI inflows and economic growth implies that increasing the stock of FDI promotes economic growth, which creates favorable conditions to attract FDI flows for the regions.

In order to achieve rapid economic growth, countries of the MENA region should strengthen their macroeconomic policies and the fight against corruption. In addition, it is important for the host country to promote and develop programs to attract FDI.

The results provide some suggestions for the policy makers to make their country more attractive for investment, by promoting and developing programs and supporting economic development. Encouraging FDI to improve institutions could be an effective way to accelerate growth and development. Indeed, the institutional quality of the host country must be good because it has a decisive influence on the

choice of the location of the country and is an essential element to create a favorable climate for foreign direct investment.

Regarding the framework of the determinants of FDI, this work opens the way for other research to examine the measures and solutions that countries can adopt to improve the quality of their institutions and promote FDI and benefit from it. Therefore, governments should improve political stability, socio-economic conditions and investment profile and reduce the level of corruption to attract more FDI.

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