



Income Convergence and FDI: Evidence from Lower-Middle Income West African Economies

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ABSTRACT

This paper examines the role of foreign direct investment (FDI) inflows into Lower-Middle Income West African Countries in realizing per capita income convergence among the countries. Employing panel unit root and Pedroni panel cointegration model on annual data spanning 1986 – 2009, the study seeks to establish whether there exist a long run relationship between FDI inflows into the countries and income convergence, as measured by annual deviations of economies from the group averages. Results emanating from the study indicate there is no long run relationship between FDI and per capita income convergence among the countries.

1. Introduction

Issues surrounding economic growth, its determinants and convergence¹ among countries of the world and regions have received remarkable attention of researchers (Crespo-Cuaresma, Foster & Stehrer, 2011). Beside its human welfare effects, the phenomenon of income/growth convergence is considered as an avenue to testing the validity of alternative economic growth theories (Islam, 2003). Despite the re-emergence of interest in the debate on growth convergence and its determinants, consensus among economists appears to be impossible. In the view of United Nations Economic Comparison for Europe (UNECE) (2000), despite the fact that the discipline of economics revolves around the subject of growth, there is seemingly a failure from the side of economist in providing clear policy guidelines for achieving long-term growth. According to UNECE, researchers in the field have not yet provided clear answers to obviously simple ‘practical questions’ relating to output growth.

Neoclassical growth theory by Solow (1956) maintains a proposition that poor countries would grow faster than the richer ones to a point where convergence in growth would take place. In view of this proposition, a lot of literature directed towards testing this hypothesis evolved. Such studies include Maddison (1983), Barro (1991) and more recently Kumar (2011), Fakhong (2012) and Miron and Alexe (2014).

Contrary to the position of Neoclassical growth model that presumes convergence among countries irrespective of the structural characteristics of countries; new growth models are pessimistic about absolute convergence, rather the theories consider human capital and technological progress as endogenous and necessary ingredients for growth (Silvestriadou & Balasubramanyam, 2000). In the view of Romer (1986) and Lucas (1988), inclusion of human capital and technological progress as endogenous

¹The term convergence refers to an economic phenomenon where poor countries tend to grow faster than the richer ones over the long run. Convergence is said to be absolute or unconditional when the gap in the output growth between richer and poor countries vanishes over time regardless of the differences in observable characteristics of the countries. On the contrast, convergence is regarded as conditional if the reduction in the gap depends on certain observable characteristics of the countries.

variables to the system of new growth models handles the issue of diminishing return on capital investments in capital-abundant nations and hence maintains that convergence is conditional.

Endogenous growth theories developed by Romer (1986) and Lucas (1988) emanated as a critical response to the preceding Neoclassical theory. The theories also emphasise on the role of idea gap bridging between poor and rich countries as one of the key factor towards achieving growth convergence among countries. In line with this, a lot of researches were conducted on the means through which 'idea gap bridging' between poor and richer nations can be achieved. Although trade and foreign investment are regarded as the possible ways via which idea gap bridging between poor and richer countries can be achieved, absorptive capacity of poor countries is regarded as a necessary condition for such countries to grab the benefits attached to the foreign investment and trade (Crespo & Fontoura, 2007).

According to Sala-i-Martin (1996a), other reasons than testing growth theories exist as to why empirical researches are being conducted on growth and issues related to it. Both from theoretical and practical points of view, it is undisputable fact that convergence in per capita output across countries is of enormous importance. For instance, in the view of Sala-i-Martin (1996a), a significant contribution resulting from re-emergence of researches on growth is using the idea of convergence to distinguish between neoclassical growth theory from endogenous growth theories. In the words of Durlauf (2003) "... convergence tests have been used to evaluate the presence or absence of increasing returns to scale in the growth process. As such, the convergence hypothesis has important implications for modern macroeconomic theory". These developments can be regarded as theoretical development that emanated from conducting investigations on economic growth convergence. "...from an economic point of view, the issue of convergence or divergence is very important (UNECE, 2000). Achieving per capita output growth convergence across world nations over the long run translates into poverty level reduction and income inequality reduction among world populace. Therefore, outcome of studies on growth convergence across world nations has enormous contribution towards providing policy recommendations on poverty reduction and welfare enhancement.

This paper seeks to examine the role of foreign direct investment (FDI) inflows into Lower-Middle Income (LMI) West African Countries (WAC) in realizing per capita income convergence among the countries. In specific terms, panel cointegration model on annual data spanning 1986 – 2013, the study seeks to establish whether there is a significant long run relationship between FDI inflows into the countries and income convergence, as measured by deviation from annual mean of real GDP per capita. Introductory section aside, the rest of this paper is structured into four sections. Section 1.2 reviews related literature on the subject matter. Sections 1.3 and 1.4 respectively outline methodology and data analysis. The final section, 1.5 contains summary of findings and conclusions.

2. Review of Related Literature

2.1. Absolute Versus Conditional Convergence

An economic phenomenon where poor countries grow faster than the richer ones in terms of per capita income is termed as absolute convergence (Barro & Sala-i-Martin, 2004:461). As highlighted by Barro and Sala-i-Martin, conditional convergence differs from absolute convergence. Conditional convergence refers to an economic scenario where the rate of growth of per capita income of an economy depends positively on the distance of the economy from its own steady state². Two economies can be converging in the conditional sense if each is growing in terms of per capita income depending on its distance from its own steady state output.

On the other hand, same economies may not be converging in absolute terms if the richer economy is growing faster than the poor one as a result of the former being further below its own steady state compared to the later. However, the two concepts are identical if the two economies are similar in terms of their steady state. Empirically, investigating absolute convergence differs from that of conditional convergence in the sense that when estimating the conditional convergence a set of explanatory variables such as savings and population growth rates are included in the standard cross-section regression.

² Refers to a point in the growth evolution of a given country where capital stock, per capita output and consumption tend to grow at the same rate that equals a given exogenous technological progress. Such process is made possible by the assumption of diminishing marginal returns on capital maintained in the Solow growth model.

2.2. Club Convergence

Another concept directly related to that of conditional convergence is ‘club convergence’. The concept was first introduced in the work of Baumol (1986). However, as noted by Islam (2003), exact formulation of the concept can be seen as a credit due to Durlauf and Johnson (1995) and Galor (1996). In the case of absolute convergence predicted by the Solow’s growth model, there is a single ‘unique equilibrium’ to which all economies approach. In the contrast, the conditional convergence hypothesis considers each economy as having its own equilibrium towards which it approaches. In other words, countries grow in per capita towards same steady state providing they are similar in terms certain characteristics, such as technology, government policies and population growth, irrespective of their initial levels of income.

At the other end, the idea of club convergence assumes multiple equilibriums and each economy approaches a particular equilibrium depending on its initial position in relation to the equilibrium and certain characteristics it possess. Therefore if a group of economies share same initial location and are common in terms of certain attributes, they tend to approach the same equilibrium and are hence considered as forming a convergence club.

In his famous study, Baumol (1986) utilised data on GDP per worker covering the period of 110 years, 1870 – 1979, for 16 industrialised market countries. Using both descriptive statistics in the form of ratios and standard deviation and a bivariate cross country regression equation, Baumol established a sort of convergence in per worker GDP across the 16 industrialised countries. Moreover, using data on output per capita for a larger sample of 72 countries similar analysis was carried out over the course of 30 years, 1950 – 1980. In contrast to the finding for the group of industrialised economies, countries in the larger sample do not only display absence of convergence, but they rather reveal evidence of divergence among them. The author therefore concludes that economies that are similar in terms of initial level of income and certain attributes, like level of industrialization in this case, tend to converge.

As mentioned above, precise formulation of the concept of club convergence is the credit of Durlauf and Johnson (1995). Results emanating from Durlauf and Johnson led the authors into drawing to important conclusions regarding convergence across economies. One, the authors observe that the linear model specification used by majority of the empirical studies on convergence is misspecified. Two, segregating the data into various groups using varying initial condition, such as initial capital and initial level of adult literacy rates, the authors observed that different countries obey different production functions. This finding by extension implies that countries growth rate patterns are compatible with multiple steady states perspective.

Although the intuition of club convergence hypothesis was conceived for close to three decades by Baumol (1986) and later formulated more rigorously by Durlauf and Johnson (1995) and Galor (1996), Alexiadis and Tomkins (2004) contend that club convergence hypothesis received relatively less attention of researchers. However, among the popular exceptions to this postulation made by Alexiadis and Tomkins are: Oxley and Greasley (1999) and Su (2003). In addition, more recent studies on club convergence hypothesis include Fischer and Stirbock (2006) and Siano and D’Uva (2006).

Su (2003) investigated club convergence across a sample of 15 OECD countries using two different sources of data. The first data source is from Bernard and Durlauf (1995), covering the period 1900 – 1987. The second source of data is from Maddison (1995) ranging 1885 – 1994. For both datasets, there is no evidence that the entire countries are converging. However, there appears to be five clubs with members ranging from two to four members. As for the comparative analysis of club convergence hypothesis on the basis of two data sources, it was discovered that results are sensitive to data choice and econometric tools. In view of this, conclusion can therefore be drawn that findings of evidence of club convergence or lack of thereof is partly dependent upon the data source and method of data analysis employed.

Alexiadis and Tomkins (2004) used data spanning 1970–2000 to test club convergence hypothesis on 13 Greek regions. Forming a total of 78 pairs, the author applied bivariate ADF technique to test for stochastic convergence. Results from bivariate ADF test divulge little evidence in favour of stochastic convergence among the regions. In specific terms, of the 78 possible pairs formed, bivariate ADF test favours stochastic convergence in only 18 out of 78 cases. On the other hand it was observed that while not all regions follow a particular pattern of convergence, some regions appear to follow common convergence path. The authors therefore conclude that there is evidence of club convergence across some regions of Greece.

In a similar study, Siano and D’Uva (2006) employed similar time-series approach Alexiadis and Tomkins (2004) adopted to study club convergence among a panel of 123 European regions from a total of nine countries. Using data covering the period 1981 to 2000 on GDP per capita in terms of purchasing power parity and employment, the authors reported some evidence in support of club convergence hypothesis. On the basis of initial level of income, average GDP growth rate over the sample period and sectoral of specialisation of the regions, four groups were formed. Studying convergence pattern among the groups, it was observed that there is strong evidence of convergence among wealthiest members of European Union. The study therefore affirms evidence of club convergence.

In a related research, Oxley and Greasley (1999), using a sample of four Nordic countries – Denmark, Finland, Norway and Sweden – found evidence in support of club convergence. Employing time-series technique on data for GDP per capita (sourced from Bernard and Durlauf, 1995) covering 1900– 1987, Oxley and Greasley established three economies – Denmark, Finland and Norway – forming club convergence.

3. Research Methodology

The study focuses mainly on the link between inward FDI flows and per capita income convergence amongst five LMI West African Countries – Cape Verde, Côte d'Ivoire, Ghana, Nigeria and Senegal. The choice of the WAC is justified by the existence ECOWAS, a regional group established on 28 May, 1975 with the view to promote economic integration in the region. By selecting this sample the study therefore serves as an assessment of the extent to which the regional group realised the goal behind its establishment. The selection of the time span is mainly influenced by the availability of data. The study would use data on real GDP per capita and FDI inflows. Data for the study was obtained from secondary source. Data on the variables of interest, per capita income and FDI, were sourced from the World Bank database of World Development Indicators (WDI). Convergence is measured in this study by computing annual per capita deviation of each economy from the group average for the corresponding year. The idea behind this estimation is that the lower the level of deviations the better the catch up performance in the group.

4. Data Analysis

4.1. Descriptive Analysis

Table 1 provides some highlights on per capita income performance of the five countries the study covers. The table provides information on minimum, maximum and average per capita income over the course of 24 year, 196 – 2009. As can be deduced from the table, Cape Verde has the highest performance in terms of average real GDP per capita over the course of 24 years. The next performing economy to Cape Verde is Côte d'Ivoire. The economy recorded an average real GDP per capita of \$628.05. As for the Ghanaian economy, it rates third with an average GDP per capita of \$257.34. This compares with Nigeria and Senegal with respective averages of GDP per capita of \$385.49 and \$495.91.

Table-1. Descriptive Analysis of Per Capita GDP for the Sample of Lower Middle Income West African Countries (1986 – 2009)

S/No.	Country	Min. Per Capita Income (\$)	Max. Per Capita Income (\$)	Average Per Capita Income (\$)
1	Cape Verde	715.18	1,878.47	1,143.04
2	Cote d'Ivoire	572.10	742.08	628.05
3	Ghana	205.17	341.55	257.34
4	Nigeria	303.66	513.50	385.49
5	Senegal	446.09	555.91	495.91

Source: Computed by author

While maximum, minimum and averages of real GDP per capita provided in Table 1 provides a lot of information on economic performance of the countries under review, growth of real GDP per capita over time is as well very important information. In Figure 1 below, real GDP per capita growth rate over time is plotted for each country over the course of 24 years, 1986 – 2009.

As can be observed from the above figure, for each of the five countries this study covers, growth rate of per capita income has been very erratic.

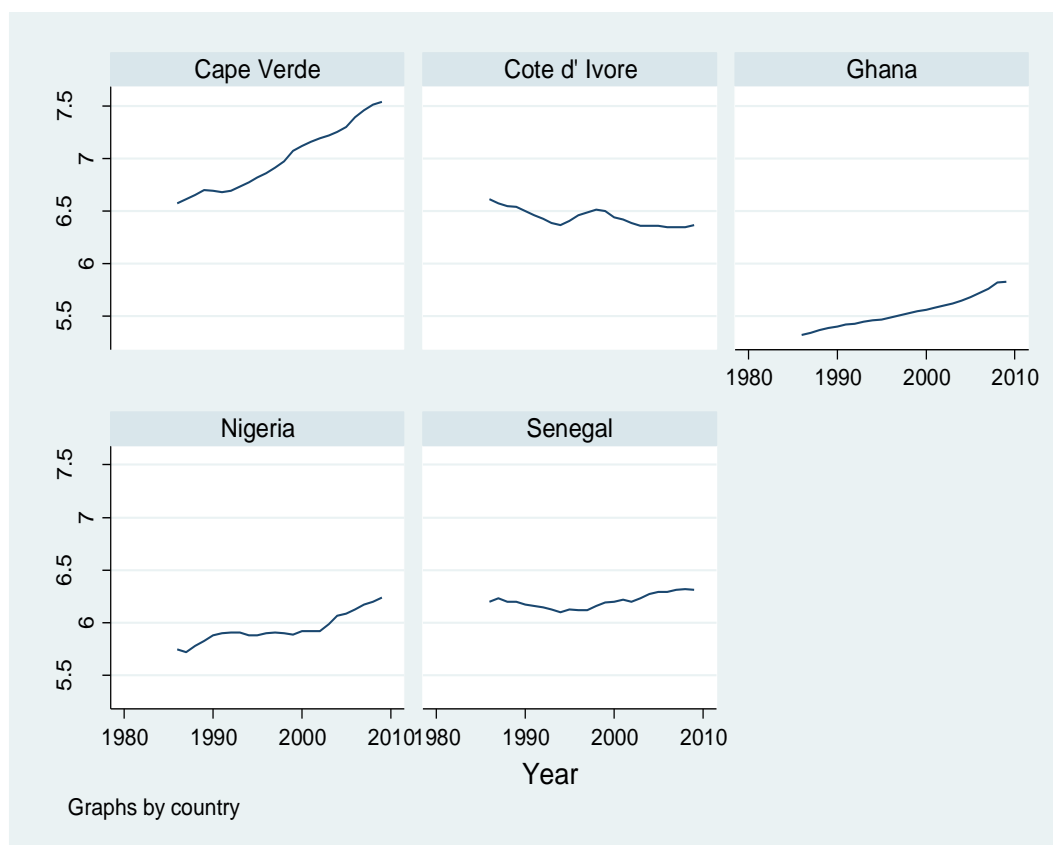


Figure-1. Real GDP per Capita Growth Rates for Lower Middle Income Economies of West Africa

This is by implication an indication of poor macroeconomic performance. Economies are under normal circumstances expected to have steady growth in per capita income. Volatile growth rates of real GDP per capita have a lot of welfare effect on citizens.

4.2. Panel Unit Root Test

In order to establish the appropriateness of employing panel cointegration analysis to examine the relationship of interest, panel unit root test was first conducted on the two variables, annual deviation of real GDP per capita of each economy – measuring catch the up – and FDI inflows. Both the variables were found to be stationary at first difference. This behaviour of the data therefore warrants the employment of panel cointegration to examine the long run relationship between the variables. In performing the panel unit root test, the popular method developed by Im, Pesaran and Shin (2003) was adopted (Tables 2 and 3 present panel unit root test). IPS is the most recent development in testing panel unit root and is developed within the framework of popular ADF test for unit root. IPS takes averages of ADF t statistic for individual panels. IPS panel unit root test is characterized by a couple of features that makes it superior over other forms of panel unit root tests. For instance, unlike the panel unit root test proposed by Quah (1992, 1994) in which heterogeneity across panels is not accommodated, IPS allows for individual heterogeneity across the panels. The IPS approach estimates the basic ADF equation specified below:

$$\Delta y_{it} = \alpha_i + \beta_i y_{i,t-1} + \varepsilon_{it},$$

The IPS panel unit root test tests null hypothesis

$$H_0 : \beta_i = 0 \text{ for all } i,$$

against the alternatives,

$$H_1 : \beta_i < 0, \quad i = 1, 2, 3, \dots, N_1, \quad \beta_i = 0, \quad i = N_1+1, N_1+2, \dots, N.$$

Table-2. IPS Panel Unit Root Test Results

Variables (level values)	Statistic	p-value
GDP_DEV	-0.98965	0.1612
FDI	0.34293	0.6342

Note: *** significant at 1%, ** significant at 5%, * significant at 10%.

Table-3. IPS Panel Unit Root Test Results

Variables (level values)	Statistic	p-value
Δ GDP_DEV	-5.56839	0.0000***
Δ FDI	-10.9335	0.0000***

Note: *** significant at 1%, ** significant at 5%, * significant at 10%.

As it can be clearly observed from the Tables 2, the IPS panel unit root test rejects alternative hypothesis for both the variables. This led to taking first difference of the variables and performing same IPS test. Results from the test are presented in Table 3. For both the variables, the IPS test rejects null hypothesis. Results from the test on the first difference of the variables therefore supports the use of panel cointegration analysis.

4.3. Panel Cointegration Analysis

The study employs Pedroni residual cointegration test to examine whether there is a long run relationship between FDI and per capita income convergence. The study measures per capita income convergence by computing deviation of each economy's per capita income from the annual average. Lesser the degree of deviations accentuates the existence of convergence and higher degree of deviations from the annual averages indicates evidence of divergence. We present the results from panel Cointegration model in Table 4.

Table-4. Panel Cointegration Analysis of Convergence and FDI

	Panel Statistic	p-value	Group Statistic	p-value
Rho statistic	0.717980	0.7636	1.769030	0.9616
PP statistic	0.102589	0.5409	1.033281	0.8493
ADF statistic	-0.157092	0.4376	0.282996	0.6114

Note: *** significant at 1%, ** significant at 5%, * significant at 10%.

5. Findings and Conclusions

West African Middle income countries have generally performed poorly in terms of GDP per capita growth stability. This may not be unrelated high volatility associated with oil prices as by their nature some of the countries in the regions are oil producing nations and they rely on oil sale proceeds to a very large extent. In terms of output convergence role of FDI, results emanating from panel Pedroni cointegration test indicate absence of long run relationship between per capita income convergence and FDI inflow. One possible explanation to this finding could be the fact that the absorptive capacity of relatively poor countries does not reach the minimum threshold required for the FDI to play any significant role in the catch up process with the better performing economies in the sample.

Moreover, Economic Community of West African States (ECOWAS) should revisit its strategies towards achieving stable growth and income convergence among member countries.

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