



JÖNKÖPING INTERNATIONAL BUSINESS SCHOOL  
JÖNKÖPING UNIVERSITY

# **The Impact of FDI on Growth in Developing Countries**

An African Experience

Paper within Economics

Master Thesis

Author: Sarumi Adewumi

Tutor: Scott Hacker Supervisor

James Dzansi Assistant Supervisor

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## Abstract

The paper examines the contribution of foreign direct investment to economic growth in Africa using graphical and regression analysis. Data for the entire continent and data for eleven countries within the continent were used for the empirical analysis. The time series data is from 1970-2003. It was discovered that the contribution of FDI to growth is estimated to be positive in most of the countries but not significant.

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## **Section 1**

### **Introduction**

In recent years, policymakers, especially in the developing countries, have come to the conclusion that foreign direct investment (FDI) is needed to boost the growth in their economy. It is claimed that FDI can create employment, increase technological development in the host country and improve the economic condition of the country in general.

In most African countries, inadequate resource to finance long-term investment is a major problem. This lack of investible funds is a big setback to economic growth and this is making it increasingly difficult to achieve the millennium development goals (MDGs) by 2015 as set by the United Nations. Foreign direct investment is seen as a major source of getting the required funds for investments hence most African countries offer incentives to encourage FDI (United Nations, 2005: 2)

Apart from making investible funds available, FDI inflow to developing countries is assumed to produce externalities through technology transfer and spill-over effect (Carkovic and Levine, 2002), which have a last longing effect on the economy.

Due to this perceived importance to economic growth (especially in developing countries), FDI should be studied and extensive research work should be done on it so as to have clear understanding of what its contribution to growth is. According to Bijit Bora (2002), since most policy makers are encouraging FDI, there is need for better understanding of its determinants, impacts and implication.

Townsend (2003) said the relationship between foreign direct investment and economic growth is not so clear. There are different views by researchers on the contributions of FDI to economic growth, based on theoretical and analytical findings. Some see FDI as a very important tool for economic growth especially in the less developed countries (LDCs) but some scholars claimed that the contribution of FDI to economic development is not as pronounced as most people believe. Yet some scholars think FDI has no positive contribution to the economic growth of the host country. There has been no consensus opinion on FDI and economic growth. Lall (2002).concluded that the contribution of FDI to economic growth depends on many factors and it varies over time and from one host country to another.

### **1.2 Purpose**

The purpose of this thesis is to show the contribution of FDI to economic growth of African countries so as to know whether the call for more FDI is truly justified. The relationship between FDI and economic growth in the continent is discussed and the contribution of FDI to growth will be uncovered. To achieve these, scholarly opinions and suggestions will be discussed and empirical analysis on FDI will be carried out. What has been the contribution of the FDI in-

flow to the economic growth? Has the contribution been positive or not? Is the contribution increasing over time? This study attempts to answer these questions and more.

For the empirical analysis, data for aggregate GDP and FDI inflow to Africa as a whole will be used. Some African countries are also selected for empirical analysis to study the performance of FDI inflow to such countries. Eleven countries are selected based on the criteria that will be discussed in section 3. Data sources for the empirical works are from UNCTAD, World Bank and the United Nations Database. The thesis will concentrate on the period between 1970 and 2003 based on the available data.

### **1.3 Outline of the Thesis**

The second section will discuss the general theoretical overview of the thesis. This includes the definition of FDI, theoretical and empirical views on the relationship between FDI and growth and FDI flow to the developing countries and Africa in particular,

The third section will cover the empirical analysis on the thesis. The section will include a graph showing the relationship between GDP and FDI growth rates after which the equations for regression analysis will be formulated. The regression equation will have some variables that are important to GDP growth. The purpose of the regression is to show the contribution of FDI to GDP growth rate for the period covered by the paper. The results of both the graph and the regressions will be discussed in this section. In section four, there will be general discussion, policy suggestions will be made followed by suggestions for further research and then the conclusion.

## **SECTION 2: Review of FDI and Growth**

In analysing the contribution of FDI to growth, it is necessary to know the type of investment that qualifies as FDI and to know those which are mostly involved in this type of investment. This section discusses the investments that can be called FDI and those involved in it. It also covers previous research works on the relationship between FDI and growth and FDI flow to developing countries in general and to Africa in particular.

### **2.1 FDI defined**

Foreign direct investment does not include all investments across border. There are some features that make foreign direct investment different from other international investments and these are discussed below.

FDI is the investment made by a company outside its home country. It is the flow of long-term capital based on long term profit consideration involved in international production (Caves, 1996). This definition is correct but not complete as the important issues of control and management are not included in it. International investment can take two forms. It could either be portfolio investment, where the investors buy some non-controlling portion of the stock, bond or any other financial security, or direct investment where the investor participates in the control and management of such business venture. This is the type of in-

vestment by multinational companies and it tends to contribute more to economic growth than the portfolio investment.

Robert E. Lipsey (1999) said Internationalized production arises from foreign direct investment. According to him, this is the investment that involves some degree of control of the acquired or created firm which is in any other country apart from the investors' country. This involvement in the control of the investment is the main feature that distinguishes FDI from portfolio investment.

*The Balance of Payment Manual fifth edition* defined FDI as Investment made to acquire a lasting interest in an enterprise operating outside of the economy of the investor. It further explains that the investor's purpose is to gain an effective voice in the management of the enterprise. Hence the investor must have 10% or more in the management. Based on this definition, the minimum contribution to management and control by the enterprise should be 10% for such to be considered as FDI. This definition is used for this paper and the data for FDI used in this paper follow this convention.

## **2.2 Who are involved in FDI?**

It is necessary to know the type of companies that are involved in FDI and what the motivation for FDI is. It is also necessary to know the bodies responsible for the regulation of FDI both at international and local levels. This will give insight into why FDI flows to some countries more than others.

Jones (1996 Page 4) defined a multinational enterprise (MNE) as a firm that controls operation or income generating assets in more than one country. He continued that "FDI is conventionally used as a proxy to measure the extent and direction of MNE activity". The investment by an MNE in any country apart from the home country is foreign direct investment; hence foreign direct investment is by the MNEs.

The main objective of MNEs, like any other business venture, is to maximise profit and to reduce cost. Therefore consideration is given to regions which are likely to bring highest returns on investments and enabling environment for business to succeed. This provides one of the main reasons why there are more FDI in some places than others. According to Sethi et al. (2003) MNE investments will be higher in regions that provide the best mix of the traditional FDI determinants.

The department of the United Nations that is responsible for the development of FDI is the UNCTAD. This body was established in 1964 specifically to integrate the developing countries into the world economy through the encouragement of foreign direct investment. Specific functions include providing technical assistance to developing countries with special attentions to the needs of least developed countries and creating a forum for intergovernmental deliberations so as to have enabling environment for FDI.

Most FDI flows are from the industrialised world to the developing countries. The developing countries have a major role to play because the policies of such countries go a long way in determining the inflow of FDI to such countries.

Hence most of these countries have investment promotion agencies to encourage foreign investment.

### **2.3 Impacts of FDI**

There are many benefits of FDI both to the host country and the home country, these benefits are noted by different authors. For instance, Alfaro (2003) said that in addition to the direct capital financing it supplies, FDI can serve as a source of valuable technology and know-how to the host developing countries by fostering linkages with local firms. These technological innovations by MNEs play a central role in the economy and they are some of the most important areas where MNEs serves as catalyst to growth in developing countries.

MNEs have the financial strength to invest in large plants. This might be very difficult for local investors due to their lack of huge investment funds which MNEs can afford. Through FDI, “scarce” capital can be made available to the developing countries. This is very crucial to economic growth. Jones (1996) notes that the transfer of capital by MNEs can supplement domestic savings and contribute to domestic capital formation for countries that are capital constrained and this can increase domestic investment.

Some investments are better off if managed under foreign control. This will put the level of government interference at its minimal. More often than not, FDI brings along solid ownership and independent management.

The secretary general of United Nations (Koffi A Annan) summarized the importance of FDI to the developing economies as follows “With the enormous potential to create jobs, raise productivity, enhance exports and transfer technology, foreign direct investment is a vital factor in the long-term economic development of the developing countries” (United Nations, 2003 page iii).

Despite the benefits that can be derived from FDI, it should be noted that it can also bring about some negative impact. For instance activities of MNEs can displace local firms that can not cope with the competition from foreign firms, thereby reducing the growth of the local firms. (Jones, 1996). Also if proper regulation is not in place in the host country, FDI can serve as a source of capital flight from the developing countries to the developed ones. For instance due to some specific risks in the host country (economic and political risks), there could be large flow of capital from the host country to the home country if there is no legislation against such practice. This can have adverse effect on the host economy especially if such capital is sourced for within the host country. Finally, due to MNEs’ higher production capacity, FDI can cause large scale environmental damage which sometimes is not well taken care of especially in the mining sector (Bora 2002). It should be noted that the net contribution of FDI to growth can only be measured empirically. Some research works on the relationship between FDI and growth are discussed in the next section

### **2.4 FDI and Growth: Review of previous studies**

GDP growth is usually the parameter to measure the economic growth of a country even though it is not the only parameter. GDP includes all the production within the country for the given period. Foreign direct investment is included

in GDP and much has been done to uncover the relationship between FDI and growth.

Many research works have shown that the contribution of FDI to growth is positive. Using different data and methodologies, many researchers have concluded that FDI has positive impact on growth. For instance, in a paper by Loungani and Razin (2001), it was reported that of the three sources of capital flow to the developing countries (FDI, portfolio investment and primary bank loans), FDI was discovered to be the most resilient during the global financial crises from 1997-1998 and also during the Latin American financial crises in the 1980s. Moss, Ramachandran and Shah (2005) had a similar conclusion in their study which focused on three countries in Africa: Kenya, Tanzania and Uganda. It was discovered that the percentage of export that is from MNEs is far more than the one from local investors. This shows that FDI contributed more to GDP than local investment in the three countries. The OECD (2002) simply stated that FDI increases efficiency of resources and raises factor productivity in the host country, so it sees the influence of FDI on growth as positive.

Some research works agree that the FDI contribution to growth is positive but depends on some factors in the host country. Alfaro (2003) concluded that the contribution of FDI to growth depends on the sector of the economy where the FDI operates. He claimed that FDI inflow to the manufacturing sector has a positive effect on growth whereas FDI inflow to the primary sector tends to have a negative effect on growth. For the service sector, the effect of FDI inflow is not so clear. However, an economy with a well-developed financial sector gains more from FDI (Alfaro et al, 2003). The impact of FDI on growth also depends on the local condition of the host country. Chowdhury and Mavrotas (2003) said FDI's contribution to growth depends on factors such as human capital base in the host country and the degree of openness in the economy, and even when FDI is contributing to the economy, its impact might not be easily noticed in the short run. Lall (2002) even said that FDI inflow affects many factors in the economy and these factors in turn affects economic growth. Therefore the impact of FDI on growth can not be measured directly since the impact is through its contributions to these other factors.

Countries with high growth can attract FDI better than countries where the economy is not in good shape. This confirms the fact that even though FDI contributes to growth, growth also influences the level of FDI in a country. Chowdhury and Mavrotas (2003) conducted a Toda-Yamamoto test of causality on three countries (i.e. Malaysia, Chile and Thailand) from 1969-2000 to explore the degree of causation between FDI and growth, and they discovered that it is GDP that causes FDI in Chile and not the other way. They also discovered that there is bi-directional causality in the other two countries. Kumar and Pradhan (2002) discovered that in the majority of cases, the direction of causation between growth and FDI is not pronounced. Furthermore, in poor countries the direction seemed to be running from growth to FDI in an equal number of cases as from FDI to growth. This conclusion is similar to that of Hansen and Rand (2004), which said that foreign direct investment and growth have a positive relationship, but the direction of causality is not clear. And knowing this direction of causality is very important for the formulation of economic policy. Although



the contribution of FDI to growth might be positive, Ray (2005) does not think it helps to develop the local industries in the host country. Hence the multinational companies can be flourishing in the host country while the local firms are not developing. This type of contribution is not good for the economy in the long run.

It is worth noting that some research work has claimed that the contribution of FDI to growth is not positive. In a study by Carkovic and Levine (2002), it was concluded that FDI does not have a robust independent influence on growth. The study employed two models for the empirical work and used data for 75 countries. Mwlima (2003) also did not see FDI as an important tool for development. He claimed that the incentives and tax holiday adopted by most African countries to attract foreign investment have not been successful; instead it is adding to the economic problems of some of the countries. He said most African countries are competing to attract FDI to the level that each country wants to give the best incentives. This sometimes leads to the situation where the incentives could be more than the gain from the foreign investment and this can leave the country worse off than it was before the investment. Zambia was mentioned as a specific example. He concluded that there is no real evidence that FDI brings development, noting that the aim of any MNE is to make profit and not to provide development. Then if these claims are anything to go by, developing countries should approach and introduce FDI with caution.

## **2.5 FDI flow to Africa**

Most developing countries were not so receptive of FDI before now. They were more comfortable with local investors who have no influence of the western world. After decades of skepticism, international events reshaped the attitude of developing countries towards FDI as the debt crises affected most of them in the 1980s and access to credit and portfolio investment was very difficult for most of the countries (Alfaro 2003). Now, almost every country wants FDI to supplement local investments and this has increased the activities of MNEs in developing countries tremendously.

It should be noted that the influence of MNEs in the world economic growth in recent years can not be underestimated. UNCTAD reported that the world FDI inflow was 648 billion dollars in 2004, and out of this sum, the inflow to the developing countries increased to 233 billion dollars, which amounted to 36% of the world total inflow. By implication, FDI inflow to the developing countries increased by 40% compared to 2003 figures while the inflow to the developed world dropped by 14% (United Nations 2005).

According to Alfaro et al. (2004), FDI received more welcome by the developing countries in the 1980s because of the debt crises such countries were facing, and more recently because of the bad shape of the economy which they believe that FDI can help to improve.

Another thing that has contributed to the increase in FDI inflow to developing countries is favourable policies by the host country towards MNEs. The growth of FDI has been facilitated by positive policies by the governments of the host countries and by the efforts of multinational companies to utilize the opportuni-

ties created by the favourable policies. MNEs are likely to get cheaper labour in the developing countries and this can reduce the total cost of production. The United Nations (2005) reported that intense competitive pressure in the developed countries is leading many multinational companies to explore new ways of improving their competitiveness. Some of these ways are by expanding operations to the developing economies to boost sales and by rationalizing production activities with a view to reaping economies of scale and lowering production cost.

African countries, like other developing countries, are trying to attract FDI because of its perceived importance. According to Ntwala Mwilima (2003), all African countries are keen on attracting FDI. They have different reasons for attracting FDI, but the reasons are like those of other developing countries and can be summarised as follows: trying to overcome scarcities of resources such as capital, entrepreneurship; access to foreign markets; efficient managerial techniques; technological transfer and innovation; and employment creation. These benefits of FDI to African countries are difficult to assess but will differ from sector to sector depending on the capabilities of workers, firm size and the level of competitiveness of domestic industries. Most African countries now have investment promotion agencies (IPAs). The roles of these IPAs include attracting FDI and protecting MNEs that come to invest. Agencies like this, if given the right tool to operate can actually increase FDI inflow to developing countries by creating a good image of the countries to potential international investors.

Despite the effort of policymakers in Africa, the continent is not attracting FDI as is supposed to be. Africa's share of FDI to developing countries has been declining over time, from about 19 percent in the 1970s to 9 percent in the 1980s and to almost 3 percent in the 1990s (Chowdhury and Mavrotas, 2003) and the rate at which it is declining is high.

FDI to developing countries increased by 40% in 2004, but the flow to Africa remains the same as it was in 2003, \$18 billion. It should be noted that a major part of the foreign investment to Africa is channeled to the oil and gas sector. The strong investment in this sector is because of high prices of oil and gas which will increase investor's profitability. (United Nations, 2005)

The reasons why the African share of the world's FDI is not increasing include, but is not limited to, political instabilities and inconsistent policies in most of the countries. Any MNE will want to operate under a lesser level of uncertainty but this can not be guaranteed in some African countries.

In a study by Rogoff and Reinhart (2003), some African countries were compared with countries from other parts of the world with the focus on inflation and currencies instability. It was discovered that high inflation and unstable currencies are some of the major reasons why Africa can not really attract FDI. Apart from the inflation rate, another factor that is limiting the inflow of FDI to Africa is infrastructure. MNEs prefer economies with good roads, uninterrupted power supply and other amenities. Production costs are usually lower in countries with well developed infrastructure than in countries with poor infrastructure. But the

effect of poor infrastructure on FDI inflow is lower than factors like foreign reserves and natural resources (Onyeiwu and Shrestha, 2004)

A report by the OECD (2002) attributes the spectacular failure of African countries to attract FDI to a mix of unsuitable national economic policies, poor-quality services, closed trade regimes, and problems of political legitimacy (United Nations, 2005). Alaba (2003) indicated that exchange rate uncertainty is one of the major reasons why FDI is not increasing in Africa the way it should be. According to him, "Proper management of the exchange rate to forestall costly distortions constitutes an important pillar in determining flow of FDI to Nigeria and indeed sub-sahara African countries".

Based on the above reasons why Africa can not attract FDI, if the continent wants to increase its share of FDI, there must be political stability, good infrastructures and economic stability. If all these are in place, the continent will be able to attract FDI like other developing countries. But it will take a considerable time to achieve these, hence the inflow of FDI to the continent might not increase in relative terms for a long time to come.

### **SECTION 3: Empirical Analyses**

#### **3.1 Methodology and Data**

In previous section, we discovered that the fraction of world FDI that flows to Africa is small in relative terms, the current section examines what the existing FDI has contributed to economic growth in the continent. In doing this, graphical and regression analysis will be used. The data for FDI inflow are from the database of United Nations conference for trade and development (UNCTAD) and the data for other variables are from the database of the United Nations. The data cover 1970-2003 (except the data for Botswana, which is from 1975-2003). The first regression analysis uses data for the entire continent. Some African countries were also selected for the empirical analyses. The motive is to have a closer look at the impact of FDI at country level so as to determine whether there is a large variation in the regression results when studied at country level. Eleven countries were selected based on the following criteria: growth rate, strong currency value, population and Geographical spread.

Some African countries are witnessing more rapid economic growth than others. Worth mentioning is the Botswana economy which has been growing faster than most of the other countries. John Koppisch (2002) reported that Botswana is one of the few countries in Africa with per capital income higher than 6,600 dollars and very strong currency in a continent of weak currencies. The inclusion of countries based on these criteria will show whether FDI inflow accounts for part of their economic growth. Some countries are also randomly selected to cover all the geographical region of the continent so as to have a fair idea of what FDI inflow contributes to the growth of Africa. The countries used for the empirical analysis are Angola, Botswana, Burkina Faso, Central African Republic, Cote d' Ivoire, Egypt, Mali, Nigeria, South Africa, Tunisia and Republic of Benin.

The next subsection has a graphical presentation and discussion of the relationship between the growth rates of the primary variables of interest, GDP and

FDI for Africa as a whole. The next subsection after that presents the regression analysis for the aggregate for Africa as a whole and the selected countries. The final subsection tests for Granger causality of the regression equation.

### 3.2 Graphical Analysis

The graph will show the GDP growth rate and the growth rate FDI in Africa. The purpose is to show the relationship between the growth rates of FDI and GDP. If the FDI growth rate is proportional to that of GDP, it might be due to FDI determining the growth of GDP. The growth rate of GDP at any time  $t$  is calculated as  $(GDP_t - GDP_{t-1})/GDP_{t-1}$ . The same method is used for the growth rate of FDI. Comparison is made between the growth rates. The result is in Figure 1.

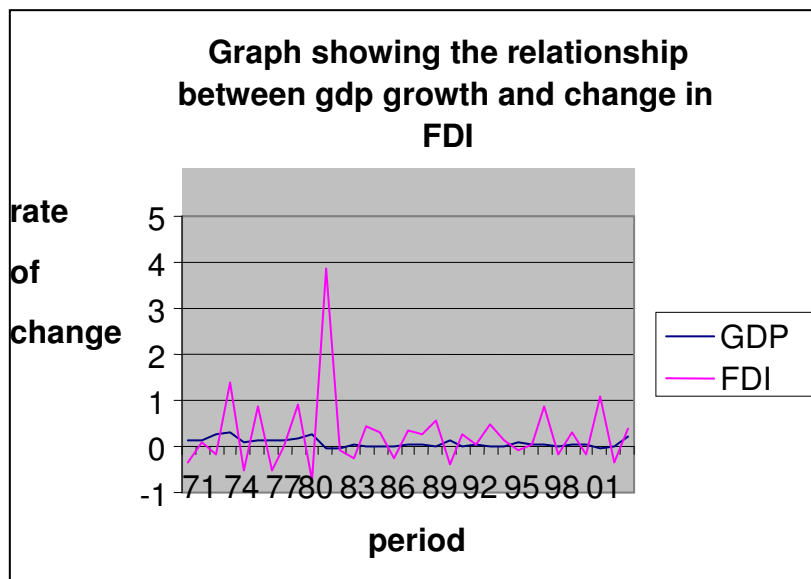


Figure 1

The figure shows that the two variables are not moving at the same rate, which might suggest that FDI inflow is not the main determinant of growth in Africa. A closer look at figure 1 shows that the rate of change of GDP is not so volatile. At any period, the GDP growth rate is not more than 27%. For FDI, the rate of change is very volatile. For instance the rate of change between one year and the next could be as high as 380%. Again, The FDI line is not moving in the same proportion as that of GDP. For instance, FDI was reduced in 1980 by almost 73% compared to 1979 figure whereas the aggregate GDP for Africa increased by 27% in the same period. In 1981, FDI inflow increased by more than 300% and yet GDP went down by 5%. It should be noted that this does not show the contribution of FDI to growth, it only shows the relationship between the growth rates of the two variables.

### 3.3 Regression and Analysis

The methodology employed for the empirical findings on this thesis involves regression analysis. Economic growth, as measured by the GDP growth rate, is the dependent variable, while FDI inflow is the independent variable of interest. There are many other variables that determine the growth of GDP. For the purpose of this study, the other variables that are included as the explanatory variables are the gross capital formation (which is the same as gross domestic investment) and net export.

The gross capital formation is the total investment in the economy for the given period. This includes domestic investment and investments by multinational companies operating in the country (foreign direct investment). It refers to the addition to the physical stock of capital. This is the flow variable that determines the level of investment in the economy. Including gross capital formation in the equation will show the contribution of general investment to economic growth and this can be compared to the contribution of FDI only, which is a fraction of gross investment.

Net export is the difference between the total export and total import. It is also known as the balance of trade. This measures the impact of foreign trade on the economy. Net export forms part of the national current account in the balance of payment. When the net export increases or decreases, the country's net international asset position changes corresponding to the increase/decrease in the net export. Most African countries do not have high export. They often import most of the finished goods produced by the developed countries, hence most of the countries often have trade deficit. When there is persistent net export deficit, it must be financed by international borrowing and these might lead to accumulation of foreign debt. This makes net export a very important variable for economic growth.

The regression equation is formulated as below.

$$\hat{Y}_t = \alpha + \beta_1 fdi_{t-1} + \beta_2 gcf_{t-1} + \beta_3 nx_{t-1} + \varepsilon_t$$

where  $\hat{Y} = (GDP_t - GDP_{t-1}) / GDP_{t-1}$ ,

$$fdi = \frac{FDI}{GDP},$$

$$gcf = \frac{GCF}{GDP} \text{ and}$$

$$nx = \frac{NX}{GDP}.$$

GDP is the gross domestic product, FDI represent the foreign investment inflow to the countries, and GCF and NX are the gross capital formation and the net export of the selected countries respectively.  $\beta_1$ ,  $\beta_2$  and  $\beta_3$  are the constants in the equation. A one year lag is used for all the independent variables, i.e.

$fdi$ ,  $gcf$  and  $nx$ . This is to see the effect of these variables of the previous period on economic growth. The impact of FDI inflow in particular is not likely to be felt on economic growth the same year it came. This model puts each of the independent variables as a fraction of GDP.

The main hypothesis for the empirical work is that the contribution of FDI inflow to economic growth in Africa is positive. This can be confirmed or denied based on the estimated value of  $\beta_1$  in the regression analyses. The null hypothesis for  $H_0: \beta_1 = 0$  i.e. FDI inflows do not contribute to growth, while the alternative hypothesis is  $\beta_1 \neq 0$

The result of the regression analysis for the entire continent over the period is presented in table 1 while the results for the countries are presented in table 2. The Durbin Watson (DW) statistic included in the result is used to test for autocorrelation in the error term. It should be noted that the closer DW is to 0, the more positive autocorrelation and if the value is near 2, then no autocorrelation is indicated. The t value is presented to test for the significance of the coefficient estimates. There are 33 observations in each of the analyses except for Botswana which has 29 observations.

Table 1: Regression result for Africa

Dependent variable is  $\hat{Y}$  as defined above.

Variables	B	t Value	R <sup>2</sup>	DW
Constant	-0.218	-1.191	0.098	1.250
$fdi_{t-1}$	1.787	0.581		
$gcf_{t-1}$	1.254	1.654		
$nx_{t-1}$	0.320	0.466		

For Africa as a whole, the coefficient estimate for  $fdi_{t-1}$  is positive but not significant at the 5% significance level according to t test. The results show a positive autocorrelation of the residual. From the regression analysis, a unit increase in lagged  $fdi$  is estimated to cause the GDP growth to increase by about 1.787 percentage points.

Of all the variables computed,  $fdi_{t-1}$  has highest effect on the GDP growth while net export, as a fraction of GDP, has a very low effect on GDP growth comparatively. GDP growth is estimated to increase by 1.254 percentage points if the  $gcf_{t-1}$  increases by one unit. When  $nx_{t-1}$  increases by one unit, the GDP growth is estimated to increase by 0.320 percentage points.

Table 2. Regression result for the countries of interest

	Angola				Botswana			
Variables	B	T Value	R <sup>2</sup>	DW	B	T Value	R <sup>2</sup>	DW
Constant	0.170	1.434	0.227	2.280	0.282	1.558	0.140	1.292
$fdi_{t-1}$	1.089	2.564			0.873	1.491		
$gcf_{t-1}$	-0.884	-1.625			-0.584	-1.018		
$nx_{t-1}$	-0.153	0.312			-0.172	-0.760		
	Burkina Faso				Central African republic			
Constant	0.218	1.263	0.078	1.435	-0.142	-1.081	0.171	2.070
$fdi_{t-1}$	11.937	1.108			3.974	1.036		
$gcf_{t-1}$	-0.455	-0.602			1.925	2.306		
$nx_{t-1}$	0.290	0.452			0.467	0.570		
	Cote d Ivoire				Egypt			
Constant	-0.212	-2.648	0.452	1.420	0.156	1.742	0.108	2.250
$fdi_{t-1}$	-4.043	-1.616			1.509	0.784		
$gcf_{t-1}$	1.585	4.175			-1.342	-1.635		
$nx_{t-1}$	2.296	4.511			-2.404	-1.737		
	Mali				Nigeria			
Constant	0.209	1.476	0.059	1.932	-0.276	-2.010	0.201	1.589
$fdi_{t-1}$	1.782	0.791			2.873	1.530		
$gcf_{t-1}$	-0.426	-0.545			1.850	2.651		
$nx_{t-1}$	0.312	0.452			0.455	1.371		

	South Africa				Tunisia			
Constant	-0.046	-0.324	0.205	1.310	0.670	3.347	0.267	1.577
$fdi_{t-1}$	-2.181	-0.829			-1.584	-1.004		
$gcf_{t-1}$	0.370	0.703			-2.309	-2.595		
$nx_{t-1}$	1.718	1.875			-1.570	-1.756		
Republic of Benin								
Constant	0.116	0.735	0.009	1.772				
$fdi_{t-1}$	0.647	0.340						
$gcf_{t-1}$	-0.246	-0.292						
$nx_{t-1}$	-0.057	-0.133						

The result for Angola shows that a 1 unit increase in lagged  $fdi$  contributes an average of 1.089 percentage point to GDP growth. This result is also significant according to the t test and of the three explanatory variables, only  $fdi$  has positive coefficient estimate. As earlier mentioned, Botswana has one of the fastest growing economies in Africa. The regression shows that the contribution of FDI in that country is also positive. This positive contribution suggests that FDI is one of the main determinants of economic growth in the country

In Burkina Faso, FDI inflow plays a substantial role in GDP. A 1 unit increase in  $fdi$  will increase GDP growth by an estimated 11 percentage point. This effect is not statistically significant however.

Of the 11 countries observed, 8 shows positive estimated coefficient for  $fdi$ . The countries are Angola, Botswana, Burkina Faso, Central African republic, Egypt, Mali, Nigeria and Republic of Benin. Only 1 of these 8 is significant according to the t test, i.e. Angola. Three countries have negative values for the  $fdi$  coefficient estimate, they are Cote d' Ivoire, South Africa and Tunisia.

### 3.4 Granger causality test

This regression presented in this subsection is to test whether  $fdi$  Granger causes growth of GDP. The equation for the test is formed by using as explanatory variables one and two year lags for both  $fdi$  and  $\hat{Y}$ , and  $\hat{Y}_t$  is still the dependent variable as above. The mathematical presentation for the equation is as follow.

$$\hat{Y}_t = \alpha + \alpha_1 \hat{Y}_{t-1} + \alpha_2 \hat{Y}_{t-2} + \beta_1 fdi_{t-1} + \beta_2 fdi_{t-2} + \varepsilon_t$$



The regression is used to explore whether *fdi* Granger-causes GDP growth.  $\hat{Y}$  and *fdi* in the equation represent the same variables as in the first regression except that here, the variables are lagged by one and two years and the lagged values of  $\hat{Y}$  are included as independent variables. There are 31 observations in the test. The result is presented in table 3. An F statistic is also used to test whether the coefficients for  $fdi_{t-1}$  and  $fdi_{t-2}$  are simultaneously equal to zero. The null hypotheses is  $H_0: \beta_1 = \beta_2 = 0$ . This will be rejected or accepted based on the value of computed F which will be tested at 5% significant level.

Table 3. Granger causality regression with all the variables

Variables	B	t value
Constant	0.012	0.332
$\hat{Y}_{t-1}$	0.421	1.972
$\hat{Y}_{t-2}$	0.116	0.547
$fdi_{t-1}$	-2.109	-0.628
$fdi_{t-2}$	4.196	1.192
Regression Sum of square (RSS)	0.069	
Residual sum of square (ESS)	0.058	

The result of the coefficient estimates is positive for  $fdi_{t-2}$  but not positive for  $fdi_{t-1}$ , and both of those coefficient estimates are insignificant. As for  $\hat{Y}_{t-1}$ , it is quite normal that the GDP growth of the previous year contributes positively and significantly to current GDP growth as shown. To test whether the coefficients of *fdi* are equal to zero, the regression above is repeated this time without the *fdi* variables

Table 4. The regression without *fdi*

Variables	B	t value
Constant	0.033	1.644
$\hat{Y}_{t-1}$	0.445	2.200
$\hat{Y}_{t-2}$	0.048	0.235
Regression sum of square (RSS)	0.058	
Residual sum of square (ESS)	0.216	

The value of F can be calculated using the formula below.

$$\frac{(RSS_2 - RSS_1)/(K - L)}{ESS/(n - (K + 1))}$$

Where  $RSS_2$  and  $RSS_1$  are the regression sum of square for the table 3 and 4 respectively,  $K$  is the number of independent variables in the regression presented in table 3 and  $L$  is the number of independent variables presented in table 4,  $ESS$  is the residual sum of square for the regression in table 3 and  $n$  is the number of observations in the series data used.

The value of the computed F is approximately 0.7006, this is lower than the critical value of F i.e. 3.37 hence,  $H_0$  will not be rejected. This means that  $\beta_1$  and  $\beta_2$  are simultaneously not significant in the equation. The implication of this is that the hypothesis that  $fdi_{t-1}$  and  $fdi_{t-2}$  are statistically not significant to economic growth can not be rejected.

#### **Section 4: conclusion and suggestions**

Based on the empirical findings of the thesis, it can be said that the contribution of FDI to growth is estimated to be positive from the continent's point of view. When dealing with some selected countries however, it was discovered that contribution of FDI was positive in some countries and not positive in others. In most of the countries and for the continent as a whole, the relevant coefficient estimate is not significant.

Can we now conclude that FDI is not needed in those countries that have no positive signs for FDI? The answer is no for the following reasons. Some impacts of FDI in the host country can not be measured quantitatively, e.g. knowledge acquisition, technology and international image, and it may take a considerable time before these variables affect growth. The methodology used for the empirical analysis has problem with low sample size and therefore might be able to show the effects of these variables on growth. Besides, FDI flow to Africa is relatively small, and this might contribute to the reasons why its contribution to growth is not large (Lensink and Morrissey (2006)).

Care should be taken when attracting FDI and it should be directed to some specific sector where foreign investment is needed most. It is possible for FDI to be contributing to the GDP and yet not increasing the welfare of the people in the host country. For instance FDI in the agricultural sector can improve the welfare in the host country than FDI in the oil and mineral sector. In countries like Nigeria for instance, there are many multinational companies in oil exploration where as there is no big multinational companies in the agricultural sector despite the potentials of the country in agriculture. This could be because investments in this area will take a considerable time before yielding profits, unlike the oil sector where "quick profits" can be made. The United Nations (2003) noted that attracting foreign investment is not enough, the national policies that will make the investment beneficial to the economy are crucial.

Even though the FDI inflow is important for economic growth, the real impact on economic development is not so clear. For instance repatriated profit by the MNEs to the home country may be a form of disadvantage to the host country, but is being counted as part of GDP for the period.

For further studies, it will be interesting to examine how FDI inflow contributes to economic development. Also, studying the impact of foreign investment on local firms in Africa will be very useful in making policy decision on the type of FDI to attract, hence this area is recommended for further research. Again knowing the impact of FDI in Africa by sector would increase the knowledge about FDI and indicate in which sector it is really needed. This area is worth studying.

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