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Impact of the Foreign Direct Investment on Economic Growth in Benin: A Cointegration Analysis

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Abstract

The role of Foreign Direct Investment (FDI) on the growth of countries under developmental transformation is a subject of vast empirical research. In some major research studies, the relationship between FDI and growth is positive although there is no clear understanding of this relationship. Meanwhile, in other research works the relationship is rather negative. So, in short, the relationship between FDI and growth doesn't appear lucid. .Thus, mitigated findings on studies carried out can be applied to different countries based on their individual specific issues or situations that are camouflaging the clarity of the role FDI plays in their growth.

This research work is therefore to examine the case of Benin between the period of 1970 and 2002. This period is considered for the research because, taking into account the interdependence of FDI and growth of a country based on previous research works, we chose a model in a form of a simultaneous equation system that is tested by two-Stages Least Square (SLS) method. This is then used to analyze the impact of the FDI on the growth rate of the real GDP of Benin. We arrive at the conclusion that FDI positively and meaningfully affects the growth rate, and that it is more efficient than domestic investment. In that regard the human capital and the degree of opening-up the economy don't play a major role as a catalyst for the growth of the country. Since their interaction with FDI has a positive effect but has no major meaningful effect on growth rate of Benin.

Keywords: Foreign Direct Investment (FDI), Economic Growth, Cointegration, Benin**.**

1. Introduction

Until recently, the positive impact of Foreign Direct Investment (FDI) on the growth of a country seems to have been factual, empirical literature has not succeeded in establishing this fact about the significant impact of FDI on the growth rate of recipient countries (Campos & Kinoshita, 2002).

From a theoretical point of view, the goal of foreign direct investment on economic growth is well established. Just as any important warning that promotes a gathering of people, FDI can positively affect growth. Moreover, it is also generally observed that FDI does not only bring in technology transfer as the only main benefits but also transfer of expertise as well as innovation capacity to the beneficiary countries (United Nations, 1987). FDI flows are also responsible to the pursuit of long term profitability a country and the main means to move a recipient country to a productive economy, FDI, via the presence of multinationals on the local market, domestic enterprises can increase their productive efficiency by taking advantage of modern technology through technology diffusion. It also promotes access to different international network of companies that are into production and also gives access into international markets for marketing of local installations. A competitive climate between foreign firms and local companies created by FDI lead the latter to be more efficient; which can induce training effects on other sectors of the economy of the recipient country. Ultimately, FDI benefits recipient country not only by the physical monetary gain but also by the various training that comes with it thereby creating and increasing employment, and the use of fitted technology advances. These potentials of FDI based on theoretical research work, make it a determinant of growth particularly in developing countries.

However, there is no unanimous approval among research works regarding the positive relationship between FDI and the growth rates of recipient country. Meanwhile, the work of Lensink and Morrissey (2001) leads to the same conclusion but that does not prevent the robustness of their results. Similar work by De Mello (1999) emphasizes that FDI is an engine of growth but only for countries where domestic capital and foreign capital are complementary. They have found that FDI has a positive impact on growth especially in countries

that the researchers define as countries with low quality of data which are generally developing countries. For Borenzstein, Gregorio and Lee (1998), FDI has a positive impact on growth but only for countries that have minimum stock of human capital. The efficiency of FDI on growth is also conditioned by the commercial opening, the level of infrastructure and size of the local financial market. The FDI itself would therefore have a significant impact on growth than when interacting with these variables, so that Saggy (2000) highlights that developing countries need to reach a certain threshold developed through the level of human capital and physical infrastructure before being able to internalize the effects associated with FDI and Saltz (1992) finally, unlike previous authors, rather thinks that FDI has a negative impact on growth.

These studies are based on panels that include a heterogeneous group of countries which do not always have the same economic characteristics, even if some analyzes include random effects, therefore the collective results can conceal the specificities of each country. In the case of Benin, does foreign direct investment there have a significant impact on the growth rate? The legitimacy of this question arises in light of the observation of the evolution of FDI flows and growth rates in this country. Any increase in flows was accompanied by a rise in the growth rate. Indeed, from 1989 to 1991, FDI entry flows increased from 62.1 to 120,8 million dollars (Global Development Finance) while the growth rate has passed from -2.85% to 4.72% (World Bank). The phenomenon is repeated equally between 1993 and 1994, 1995 and 1996 and then from 1998 to 2000 while FDI inflows increased respectively from 1.4 to 13.6, from 7.4 to 28.6 and 34.7 to 64.3, Benin growth rates increased again from 3.52% to 4.37%, from 4.4 to 5.5% and 4.5 to 5.8%.

Like many developing countries, Benin has long shown suspicious or even hostile attitude towards FDI as they are often the result of multinationals, which are suspected of jeopardizing the National Independence (Mucchielli 1992). But emergence of globalization (the latter being characterized by increased internationalization of production and capital mobility) contributed to a reassessment of the place and role of foreign direct investment in national economies (Michalet, 1999). So after decades of hostility, foreign direct investment is an increasingly developed strategies component; attracting FDI has become an important element of policy for developing countries in pursuit of the objective of growth (Tong Younxin and Hu, 2003). To do this, many policies are deployed to attract direct investment. In Benin, they have mainly be seen through trade liberalization programs, including those of investment regimes (tax relief, creation of free trade zone, etc.) To create an environment conducive to the inflow of FDI. Recent years have thus been marked by a significant increase in the level of FDI flows, although the volume remains relatively low in the direction of the country. In the same time, the growth rate in GDP has also witnessed an increase in ten years from 4% in 1992 to 6% in 2002.

The purpose of this work is to determine the impact of foreign direct investments on the economic growth of Benin. Specifically, it will provide some answers to the following questions:

• Does FDI affect positively and significantly the GDP growth rate in Benin?

• Is FDI more efficient than domestic investment?

• If so, does the stock of human capital and trade openness reinforce this efficiency?

The structure of the paper is as follows. Section 2 reviews the literature on the impact of FDI on economic in host countries. Section 3 provides a description of the methodology. Section 4 econometric estimation techniques, Section 5 Econometric findings and interpretations, Section 6 Discussion and lastly draw concluding remarks.

2. Literature review

2.1 Foreign Direct Investment

Foreign Direct Investment refers to the control of 10 percent or more of an enterprise's voting right or the equivalent interest in an unincorporated business (Griffin & Pustay, 2007). Farrell (2008) also defined FDI as a package of capital, technology, management, and entrepreneurship, which allows a firm to operate and provide goods and services in a foreign market. In 2002, OECD stated that countries with weaker economies consider FDI as the only source of growth and economic modernization. As a result, many governments, particularly in developing countries, give special treatment to foreign capital (Carkovic and Levine, 2002). It is common that countries have public agencies whose aim is to attract foreign investments using public funds, which shows that governments are willing to bear some costs to attract such investments (Ford et al., 2008).

2.2 Economic Growth

Economic growth is the increase in the inflation-adjusted market value of the goods and services produced by an economy over time. It is conventionally measured as the percent rate of increase in real gross domestic product, or real GDP. Of more importance is the growth of the ratio of GDP to population (GDP per capita, which is also called per capita income).

Economic growth per capita is usually driven by improvements in productivity. Increased productivity means producing more goods and services using the same inputs of labor, capital, energy, and/or materials. A high savings rate is linked to the standard of living. Higher saving will in the long run lead to a permanently higher output (income) per capita as capital accumulation per individual also increases. Thus, growth is usually calculated in real terms, i.e. inflation-adjusted terms, in order to obviate the distorting effect of inflation on the price of the goods produced. In economics, "economic growth" or "economic growth theory" typically refers to growth of potential output, i.e., production at "full employment", which is caused by growth in aggregate demand or observed output. GDP growth is an indication that businesses are hiring and investing. These indicators are mostly statistics that show government-issued health and growth of the country, especially in the economic front.

2.3 Impact of FDI on Economic growth

Theoretically, FDI is concerned with having a direct impact on the growth of an economy through capital accumulation, and the incorporation of new inputs and foreign technologies in the production function of the host country. Empirically, Neoclassical and endogenous growth models have been widely used to test those theoretical benefits of FDI. However, the results are varying. The reasons include sample selection (e.g. developed versus less developed countries), the selected estimation techniques (e.g. OLS, Granger Causality, Cointegration, Error correction models), and the selected time period, the estimation methodology (i.e. time series versus cross- section), etc. (Almfraji & Almsafir, 2013) the FDI's interaction with human capital has received considerable attention. Regarding the complementarity between domestic and foreign investment, (Kentor, 1998) calculated foreign capital dependence and showed that countries with a relatively high dependence on foreign capital exhibit slower economic growth than less-dependent countries for the years 1940-1990, which also supports the earlier findings of (Dixon & Boswell, 1996). They argued that foreign investment has an initial positive effect on growth but in the long run the dependence on foreign investment exerts a negative effect on growth, because the infrastructure and institutions that develop with foreign investment support further foreign investment; and negative externalities such as unemployment, over-urbanization, and income inequality perpetuate the problem.(Kentor & Boswell, 2003) selected a different measure - foreign investment concentration - the percentage of total foreign direct investment stocks accounted for by the top investing country, still illustrated a long term negative effect on growth.

Despite the fact that the impact of FDI on economic growth has been widely studied, there are still questions concerning the real effects of FDI, and also concerning the necessary conditions and the channels through which FDI leads to host country economic growth. In fact, although many studies have confirmed positive effects of FDI, some authors stress that there is still no consensus on the degree of these effects (Blomström and Kokko, 1998; Lim, 2001). Also Pessoa (2007) and Wang (2009) report that the main conclusion to be drawn from several studies is that results are ambiguous. Among the studies that have concluded that FDI does not generate economic growth are those of Haddad and Harrison (1993), Grilli and Milesi-Ferretti (1995) and Javorcik (2004). Others share the widespread view that FDI engenders economic growth, especially Blomström (1986), De Gregorio (1992), Mody and Wang (1997), Nair-Reichert and Weinhold (2001), and Lensink and Morrissey (2006) studies. However, as Vissak and Roolaht (2005) pointed out, the number of studies that show positive effects of FDI is much higher than those that focus on negative effects. (Borensztein, De Gregorio & Lee, 1998) found in a cross-country regression framework for 69 less-developed countries in the period 1970-89, that inward FDI has positive effects on growth through its interaction with human capital. And FDI contributed more to growth than domestic investment and it also had the effect of increasing domestic investment. According to them, it should be noted that growth equations are extremely sensitive to proxies of human capital. In a panel data framework for a sample of 18 Latin American countries for the period 1970-99, (Bengoa & Sanchez-Robles, 2003) stated that in order for a positive effect from FDI to be achieved, the country must have an adequate level of economic stability, and liberalized capital markets, as well as human capital. (Li & Liu, 2005) in a panel data analysis for 84 countries over the period 1970-99 found that FDI affects growth directly and also indirectly through its interaction with human capital.

3. Methodology

To understand the effects of FDI on growth, several econometric methods are used. We will make a brief critical review of these methods before proposing the methodology we use in our work.

3.1 brief review of econometric methods

In the case of specific studies to countries, the use of time series is one of the appropriate methods (Zhao, 1995; De Mello, 1997 etc.). The main arguments for these are that panels which were studied implicitly require or imply a common economic structure and a similar production technology between countries, while the time series used to highlight the specificities of each country studied. Indeed, the economic growth of a country is not only influenced by FDI and other factors production. It is also affected by a host of internal policies such as education policies, fiscal and external, which may be as many channels through which FDI profits can be maximized (Tong Younxin and Hu, 2003). Another suitable method is the use of linear simultaneous equations system. Some authors (Gupta and Islam 1983, Lee and Rana 1986, Snyder 1990 and Assante Singleton 2002, etc.) have used such models to see the impact of FDI on the economy. These models have the main advantage of taking into account the endogenous nature of growth, both directions of causality being simultaneously integrated into the system.

3.2 Econometric Analysis

3.2.1. Specification analytical model

We use a linear model of simultaneous equations. The choice of the latter is justified by the fact that inflows may influence the growth rate. But in turn, the growth rate can also have an interesting effect on the flow. The fact that a single estimate equation does not take into account such interdependence between the two variables and do not take this into account can lead to bias and has little consistent estimates. For this, we firstly have the FDI equation and secondly, that of the growth rate. In terms of FDI equation, it is borrowed from the one commonly used in the economic literature to determine the factors attracting FDI to a given country. After the correlation test between some of these variables, we selected some which appeared relevant. To them, we simply added the Uemoag variable to account for the effect integration.

FDI= f (y, TO, ITE, FDI, INFL, GOVC, Uemoag) …..…… (Eq 1)

Where,

FDI, FDI inflow as a percentage of GDP

y, GDP growth rate,

TO, the degree of Trade openness,

ITE, index terms of trade,

IDF, financial development index,

INFL, the inflation rate,

GOVC, government consumption as a percentage of GDP,

UEMOAG on the WAEMU zone growth rate.

For equation growth rate, it is basically inspired by that of Borensztein et al (1998), which is as follows:

$g = c(l) + c\ (2)\ FDI + c\ (3)\ FDIKH + c\ (4)\ KH + c(S)Y_o + c\ (6)\ A$ …... (Eq 2)

And g is the GDP growth rate per capita, KH the stock of human capital, Y_o is the GDP per initial capita FDI is the net foreign direct investment percentage of GDP and A, the vector of other variables included in the growth models including government spending (GOVC) gross domestic investment (INV), population growth rate (POP) and the rate of Inflation (INFL). Moreover, given the objectives of our work. The g will in our case, stand for the real GDP growth rate and the degree of openness (TO) is added to the list of explanatory factors of the latter. Y, GDP per capita is also excluded as this variable is used in the aim of highlighting the convergence rate between the panel of countries into account. The growth mode looks broadly as follows:

y = f (TO, KH, GDP INV, FDI, GOVC) ……..…… (Eq 3.1)

Where,

Y is equivalent to g

KH, the enrollment rate in secondary school,

INV, the investment within a percentage of GDP,
FDI, gross foreign direct investment as a percentage of GDP and,
The other variables have been defined above.

To verify the assumptions set out above, four other derived forms of this first equation will be estimated. The latter are as follows:

y = f (TO, KH, GDP, INV, FDI, FDIKH, GOVC) ……..…. (Eq 3.2)

y = f (TO, K.H, GDP, INV, FDIKH, GOVC) ……..... (Eq 3.2)'

y = f (TO, KH, GDP, INV, FDI, FDITO, GOVC) …… (Eq 3.3)

y = f (TO, KH, GDP, INV, FDITO, GOVC) …….. (Eq 3.3)'

The first specification allows us to directly compare the efficiency of foreign direct investment than domestic investment, while the last four specifications will compare the terms of interaction, namely the role of human capital and rates openness in interaction with FDI, domestic investment. Since we selected three specifications of the function of the growth rate, we will have to estimate three systems of equations that are:

$$(Eq\ 1) \rightarrow \begin{cases} FDI = f(y, TO, ITE, IDF, INFL, GOVC, Uemoag) \\ y = f(TO, KH, GDP, INV, FDI, GOVC) \end{cases}$$

$$(Eq\ 2) \rightarrow \begin{cases} FDI = f(y, TO, ITE, IDF, INFL, GOVC, Uemoag) \\ y = f(TO, KH, GDP, INV, FDI, FDIKH, GOVC) \end{cases}$$

$$(Eq\ 2') \rightarrow \begin{cases} FDI = f(y, TO, ITE, IDF, INFL, GOVC, Uemoag) \\ y = f(TO, KH, GDP, INV, FDIKH, GOVC) \end{cases}$$

$$(Eq\ 3) \rightarrow \begin{cases} FDI = f(y, TO, ITE, IDF, INFL, GOVC, Uemoag) \\ y = f(TO, KH, GDP, INV, FDI, FDITO, GOVC) \end{cases}$$

$$(Eq\ 3') \rightarrow \begin{cases} FDI = f(y, TO, ITE, IDF, INFL, GOVC, Uemoag) \\ y = f(TO, KH, GDP, INV, FDI, FDIKH, GOVC) \end{cases}$$

3.2.2 Hypothesis

To achieve these objectives, the following assumptions are retained:

H_1: FDI positively and significantly affects the growth rate in real GDP.

H_2: The elasticity of FDI growth is greater than the elasticity of domestic investment growth.

H_3: The degree of trade openness and a stock of high human capital reinforce the efficiency of FDI.

3.2.3 Data analysis

a. The variables

The dependent variables are: the growth rate of real GDP mark (y) and FDI inflow as a percentage of GDP. As for variables, they are divided according to the models in which they find themselves. We have also:

The explanatory variables of the FDI model

It should be noted here that the variables in this equation are particularly used as instrumental variables. The expected signs of the coefficients of these variables are for guidance only. The opening rate of trade notes (TO). The expected sign is positive to the extent that a more open economy to international trade and therefore to trade can justify the relocation of investments. The financial development index rating (IDF) is measured by the ratio of money supply to the gross domestic product. Financial development is an indicator of the state of the country's financial structure. Its expected sign should be positive. Government spending (GOVC) is used in this equation as a proxy for the size of the state. A high level of this indicator indicates the involvement of the public sector in the economy and hence low productivity of inputs. The expected sign is negative to the variable area growth rate recorded Uemoag, it is to be calculated from real growth rates of the countries in the study period. Only six of the eight countries of WAEMU are taken into account. Indeed, Mali left the union in 1962 and did

reinstated in 1984. Similarly, Guinea Bissau has adhered to the area in 1997. The expected sign should be positive. The index terms of exchange (ITE) is an indicator which measures trade competitiveness exterior and thus their opportunity, it is complementary to the degree of opening and is measured as the ratio between the price index for export and the import. The expected sign is positive. The inflation rate (INFL) here is an indicator of the discipline policy in place by monetary authorities to ensure macroeconomic stability. It is approximated by the GDP deflator. The higher it is, the less the economic climate will be conducive to foreign investment, and the expected sign should be negative. Finally taking into account, the growth rate (y). Its high level indicates the prosperity of the host economy, it can be a factor in attracting FDI and the expected sign must be positive.

The explanatory variables in the growth rate model

Human capital (KH) approach is the gross enrollment rate in secondary school. The sign of the coefficient should be positive. Indeed, a higher stock of human capital implies facilitating the transfer of technological innovations, allowing increasing productivity through more efficient use of investment and therefore, an improvement of growth. Gross domestic investment (INV) is taken as a percentage of gross domestic product. Its sign should be positive as provided in theoretically, variable foreign direct investment (FDI) is in terms of a flow period chosen. We retain only the net inflow since the objective is to determine the impact of these flows on the growth rate of the recipient country. The expected sign of this variable coefficient should be as positive. Government consumption: the current government spending relative to GDP is recorded and GOVC. The expected sign is negative because the higher the current consumption of state is, the higher it should have need of resources to finance its deficit ahead. And face the risk of confiscation, investments will be lower and thus the GDP growth rate will be low. The degree of trade openness (TO) measures by the sum of exports and imports of goods and services as a percentage of GDP. A high ratio suggests low trade barriers, which can be favorable to progress via technology, via imports, and therefore to growth. As for GDP, it's the GDP per capita and is made level and at constant 1995 prices. The sign of the coefficient should be positive. In terms of the interaction terms, these two terms FDIKH and FDITO. Given that FDI variables, TO, KH are supposed to positively affect growth, it is expected ace coefficients of these two variables are as positive. They are obtained by the FDI variable produced by each of KH and TO variables.

b. Data sources

The data mainly come from the database of the World Bank, particularly Africa Database CD-ROM 2004, and World Bank Indicators 2005. As for estimating, it will cover the period 1970 to 2002.

4. Econometric estimation technique

Before any estimate of linear simultaneous equations models, it is important to ascertain whether the equations are in, fair or identified. Where by g, the number of endogenous variables of the model, g' the number of endogenous variables of equation j, k the number of external variables in the model, and k' the number of exogenous variables of equation j', the condition identification is as follows:

If $(g - g') + (k - k') < (g - 1)$, the equation below is identified and its parameters cannot be estimated.

If $(g - g') + (k - k') = (g - 1)$, the equation is just identified, the equation can be estimated by every square indirect (MCI) and the Two-stage Least Square (T.S.L.S).

If $(g - g') + (k - k') > (g - 1)$, the equation is identified and the parameters can be estimated from the equation by double least squares.

In the econometric literature, the estimation techniques of simultaneous equations systems can be divided into two groups. On one side, the estimation techniques have limited information which include MCI, T.S.L.S and MVIL (maximum likelihood has limited information). They focus on a single equation in which the attention is focused on an equation at one time without using all the information contained in the detailed specification of the rest of the way. On the other side, the estimation techniques have comprehensive information that groups 3SLS (Tri least squares) and MVIC (maximum likelihood has full information). These methods involve the whole system or all the equations of the structural model, completely specific, are estimated simultaneously. The latter techniques are more accurate than the first.

Applying the conditions for identifying the above equations and given the choices available, the technique of double least squares seems most appropriate in the context of our work. Then, we proceed the various tests and interpretation for the results. All the estimations will be run with EVIEWS 3.1 software.

5 Econometric Findings and Interpretations

5.1 Stability and significant Test

a. Tests of stability of models

With equations estimated by the method of Two-stage Least Square (T.S.L.S), the stability test is limited to test CHOW. We retain two break points: 1989 and 1994. This choice is dictated by the fact that at these two dates, they have been profound reforms in Benin economy. 1989 marks the beginning of the implementation of Structural Adjustment Programs (SAPs) and 1994, the devaluation of the franc CFA. So do we assume that from each of these dates, changes may occur on the coefficients.

Test of FDI

Chow Breakpoint Test: 1989

F-statistic	0 960583	Probability	0.496480

Chow Breakpoint Test: 1994

F-statistic	0.82117!	Probahili1v	.595080

Probability is greater than 5%: the model (1) is stable. The investment function is stable in the period from 1970 to 2002.

Test of Y

Chow Breakpoint Test: 1989

F-statistic	1.298335	Probability	0.308097

Chow Breakpoint Test: 1994

F-statistic	1097813	Probability	0.410954

Probability is Greater Than 5%: the model (3.1) is steady. It is for the other equations whose testing the first results are similar. The investment function is steady over the period from 1970 to 2002.

b. Coefficients Significance Tests

The analysis of each of the results shows that all the models are globally significant, as Prob (F-Statistic) are all below 5%. In the case of equations estimate by the DMC, the interpretation of R2 does not show the same meaning as that usual one makes by this statistic because of the introduction of instrumental variables. However, an analysis of F-statistic shows that the growth rate models are globally significant which relates the explanatory variables in the equation (2), only the human capital (KH) is not significant. Indeed, GDP, gross domestic investment (INV) and foreign direct investment (FDI), the degree of openness (TO) and government expenditure (GOVC) significantly affect the threshold of 5% growth rate because the t-stat which are associated to them are higher than the critical value. As for other equations, the introduction of terms of interaction does not change hardly the results. Indeed, all variables cited above remain significant apart from the FDI variable which impact varies from one equation to another. Also, the interaction variables (FDIKH and FDITO isolated or not) are not significant.

5.2 Interpretations of the Results

5.2.1 Impact of FDI on the growth rate

It follows from this result that the foreign direct investment (FDI) positively and significantly affects the growth rate of real GDP in Benin. C (FDI) = 0.87, meaning that a 10% of foreign direct investment, leads to an increase of 8.7% growth rate in Benin.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-39.62861	13.03349	-3.040523	0.0055
TO	0.431188	0.124602	3.460521	0.0019
KH	0.153674	0.163658	0.938993	0.3567
FDI	0.869085	0.424623	2.046723	0.0513
INV	0.377335	0.176153	2.142084	0.0421
GDP	0.119226	0.035941	3.317278	0.0028
GOVC	-0.767227	0.270631	-2.834955	0.0089

R-squared	0.561943	Mean dependent var	3.446736
Adjusted R-squared	0.456809	S.D. dependent var	3.467991
S.E. of regression	2.555961	Sum squared resid	163.3235
F-statistic	**5.730656**	Durbin-Watson stat	**2.602323**
Prob(F-statistic)	**0.000734**		

C (TO) = 0.43 means that 10% increase in opening degree will lead the growth rate to also increases by 4.3%.

C (KH) = 0.15 mentioned above, capital has no significant impact on growth. However, when it increases by 10%, growth suffers a 1.5% increase.

C (GDP) = 0, 12 means that if the GDP per capita increased by 10%, the growth rate up 1.2%.

C (GOVC) = - 0, 76 examined as provided for by the theory, the sign of this variable is negative, any increase in government expenditure leads to a decline in the growth rate in the order of 7.6%.

5.2.2 **Role of human capital and the opening rate**

The effects of human capital and the opening degree are seized by the interaction terms. The more the country is endowed with a high stock of human capital, it could better enjoy the externalities of direct investment and its

ability to adopt new technologies also depends upon it. Similarly, the degree of opening promotes new technologies influencing the technological progress and consequently the growth rate.

The introduction of interaction terms changes the results of the impact of FDI on the growth rate. Indeed, the FDIKH and FDITO terms certainly positively affect the growth rate but not in a significant way. These results indicate that in the case of Benin, human capital and the rate of opening does not seem to play the catalytic role expected from these two variables.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-42.79061	17.87079	-2.394444	0.0248
TO	0.311541	0.134789	2.311324	0.0297
KH	0.034327	0.184375	0.186179	0.8539
FDI	1.588992	1.837730	0.864649	0.3958
FDIKH	0.078382	0.129497	0.605280	0.5507
INV	0.386464	0.174798	2.210917	0.0368
GDP	0.149807	0.063710	2.351408	0.0272
GOVC	-0.924533	0.327916	-2.819420	0.0095

R-squared	0.588286	Mean dependent var	3.446736
Adjusted R-squared	0.468203	S.D. dependent var	3.467991
S.E. of regression	2.529011	Sum squared residual	153.5015
F-statistic	**4.743167**	Durbin-Watson stat	**2.446707**
Prob(F-statistic)	0.001848		

The combination of IDE and FDI or KH and TO variables on the growth rate is very low. We have c(FDIKH)= 0.08 and c(FDITO) = 0.02, thus the effects of foreign direct investment are reduced, which means that the level of human capital and for opening rates are not sufficient to induce a much larger increase in foreign direct investment.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-35.21970	16.75346	-2.102234	0.0462
TO	0.363120	0.164428	2.208375	0.0370
KH	0.099647	0.180538	0.551946	0.5861
FDI	0.170482	8.049954	0.021178	0.9833
FDITO	0.017363	0.183168	0.094795	0.9253
INV	0.402426	0.204802	1.964950	0.0611
GDP	0.116691	0.039024	2.990197	0.0064
GOVC	-0.798678	0.268044	-2.979653	0.0065

R-squared	0.583040	Mean dependent var	3.446736
Adjusted R-squared	0.461426	S.D. dependent var	3.467991
S.E. of regression	2.545075	Sum squared residual	155.4578
F-statistic	4.782537	Durbin-Watson stat	2.584800
Prob (F-statistic)	0.001757		

Even when the terms are considered separately, their impacts on the growth rate remain the same: positive and non-significant.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-31.32143	0.124293	2.901290	0.0076
TO	0.360610	0.167369	0.633941	0.5319
KH	0.106102	0.025227	1.249158	0.2232
IDEKH	0.031513	0.176362	2.296460	0.0303
INV	0.405009	0.037211	2.814203	0.0094
GDP	0.104719	0.278720	-2.758974	0.0107
GOVC	-0.768981	0.124293	2.901290	0.0076

R-squared	0.556749	Mean dependent var	3.446736
Adjusted R-squared	0.450369	S.D. dependent var	3.467991
S.E. of regression	2.571068	Sum squared residual	165.2597
F-statistic	**5.233579**		
Prob(F-statistic)	**0.001306**	Durbin-Watson stat	**2.513095**

The effect of the FDIKH has decreased from 0.08 to 0.03, while the second remained steady (at the same level).

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-35.45661	12.24041	-2.896684	0.0077
TO	0.365709	0.107884	3.389848	0.0023
KH	0.101559	0.153455	0.661813	0.5141
IDEKH	0.013488	0.007613	1.771674	0.0886
INV	0.400154	0.171229	2.336955	0.0278
GDP	0.117022	0.035095	3.334459	0.0027
GOVC	-0.798561	0.263021	-3.036113	0.0055

R-squared	0.581613	Mean dependent var	3.446736
Adjusted R-squared	0.481200	S.D. dependent var	3.467991
S.E. of regression	2.497916	Sum squared residual	155.9896
F-statistic	**5.792218**		
Prob(F-statistic)	**0.000685**	Durbin-Watson stat	**2.581903**

5.2.3. **Comparison of efficiency between FDI and INV**

C (INV) = 0.37. Any induction of the investment to a 10% increase results in a higher growth of 3.7%.

In general use, based on the sign of the coefficients of the two variables, it appears that the FDI is more efficient than the inside investment. When inside investment increases 10%, the growth rate increases only 3.7% while the effect of foreign direct investment is 8.7%.

But when foreign direct investment is interacting with the human capital and the opening degree, it becomes less efficient than the domestic investment (and is no more significant). At this level, it should be noted that the assumed catalysts variables are the ones that do not play the expected role.

6 Discussion

The various results we have achieved involve a number of actions in order to bring improved benefits to be derived from FDI. The results show that FDI has a significant impact on growth. The FDI is not irrelevant on growth in Benin. However, interacting with the human capital and the rate of openness, FDI is not significant and poses the problem of the role played by these two variables. We therefore propose a few recommendations aimed primarily at increasing the volume and enhancing the conditions to allow FDI have decried the effects on growth in Benin.

6.1 The promotion of FDI

The results show that FDI has a positive and significant impact on growth. It is important for Benin in an international context of attracting them, to pursue policies aimed at making the country one of the largest recipients in order to derive more benefits. According to UNCTAD (2004), one of the most important reasons that lead TNCs to invest in Benin is the ability to access markets of West Africa (UEMOA and Nigeria). A stable political and macroeconomic framework, the opportunities offered by the port of Cotonou and the presence of natural resources were also mentioned. However, the sign of the variable Uemoag shows that when the WAEMU zone growth is experiencing improvement, FDI flows to Benin fall so significative23. Presumably they are directed to other more dynamic countries like Ivory Coast, Senegal or Mali. The challenge will be to set up an investment promotion strategy based on its competitive advantages.

6.2 Strengthening the absorption capacity

The capacity of absorption resulting in the stock of human capital does not seem, in the case of Benin, play an important role with regard the impact of FDI on the growth rate. Indeed, human capital has little effect on the growth rate and its interaction with FDI gives a result equaled unsatisfactory. This can be a priori in the enrollment rate in secondary school still low in the country. He did not reach the minimum threshold required to play its catalytic role and induce a positive effect on growth. In this case, it is recommended that actions are moving towards policies of active education in order to reach the threshold of 1.9 years of school education per individual needed to benefit from technology transfer (Xu, 2000). According to the classification Borensztein et al (1998), Benin would be adamant in countries with only 0.45 years of schooling per person. The gap remains large and therefore to fill.

The objectives of the State of Benin on education policy would be to increase this rate. This could go through the creation of training and specialization centers in order to improve the technical capabilities of the workforce. The workforce is available but it is not sufficiently qualified. It is therefore necessary to equip the country to meet the requirements of TNCs and remain competitive, especially in high technology areas.

6.3 Trade liberalization

As above mentioned, the degree of opening positively and significantly affects the growth rate, but not when it is interacting with the FDI. Here too, the opening rate does not appear to play a catalytic role in the effects of FDI on growth. A strong trade opening induces a high growth rate without implying an increase of FDI. Therefore, it will be to conduct a commercial policy of selective opening in admitting that such investments with the ability to be industrializing. Authorities should apply in this regard special attention to projects that develop the capacity to production of the national economy and improve the balance of payments, for example by diversifying exports. In this context, efforts for promoting FDI should be concentrated on industries where: i) technological capacity is relatively high and, ii) product differentiation and / or economies of scale are not significant so that local firms remain competitive. This policy should be necessarily accompanied by a marked improvement in the investment code.

7 Conclusion

The present work examines whether the FDI has a positive and significant impact on the growth rate in Benin. It was also discussed in this work a comparison of the efficiency of direct foreign investment, in the presence or not of factors such as human capital and openness rate, with the Domestic Investment. To do this, the linear model with simultaneous equations was used and as estimation technique, the choice fell on the Two-Stage least squares. The latter is justified by the fact that there can be interdependence between the FDI and the growth rate. Indeed, FDI can positively affect growth, but in return, the level of growth can be an attractive element for the foreign investments.

At the end of our work, it appears that the foreign direct investment has a positive and significant impact on the growth rate of real GDP in Benin. However, we note that FDI is more efficient than the Domestic Investment whose impact on the growth rate is positive. It is important to note that the impact of the latter is significant. And as regards for the role played by the catalyst human capital and the rate of openness, it appeared that in the presence of these two variables, the impact of FDI is low and affect positively but not significantly growth rates. Therefore, the human capital and the degree of trade openness do not reinforce the impact of FDI on the growth rate in Benin.

So, we suggested the improvement of policies for investment and trade, and politics. They will allow Benin to strengthen the requirements necessary to attract foreign direct investment flows. The degree of openness of the country being still weak, governmental actions must be taken in this direction to boost it while ensuring that the

quality of FDI is of much importance than the quantity. Therefore, the purpose is to target investment having industrializing character. As for the investment policy, it should aim to boost the volume of foreign investments to the country through the alleviation and the attractiveness of the investment code.

Benin's case results line-up with those of the authors for whom FDI positively and significantly affect the growth rate. However, it should be mentioned that one of the problems encountered in this work is the conformity of databases on foreign direct investments flow. They indeed differ radically or sensibly from a source to another. In this sense, the further studies might consider the issue of the differences in database and their consequences on the results related to the impact of FDI on the growth rate of Benin, and in a larger perspective, the countries belonging to the West African Economic and Monetary Union.

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