FOREIGN DIRECT INVESTMENT AND HUMAN CAPITAL DEVELOPMENT IN NIGERIA

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ABSTRACT

This study examined the relationship between foreign direct investment and human capital development in Nigeria. The Impulse Response Function of the Vector Auto-Regression (VAR) estimation methodology is the framework of analysis. Findings indicate that foreign direct investment had minimal effect on human capital development in Nigeria while the latter on the other hand had no considerable impact on the former. However, while the lag of human capital development had marginal impact on its value in the current period that of foreign direct investment was of considerable impact. Therefore the imperative is for the country to properly manage its foreign direct investment in order to continue to attract the inflow of same in successive periods.

Key Words:Human Capital, Foreign Direct Investment, Nigeria
JEL Classification: J24, F36

INTRODUCTION

Foreign direct investment and human capital development are among the crucial economic growth and development factors; both for developed and developing countries. Foreign direct investment provides investible resources. This is particularly so for less developed countries experiencing resources' gap in their development quest. In addition to this and given the nature of this variant of foreign investment, the recipient economy is availed new production techniques, innovations, new and improved labour and management skills and access to international markets. Issues of interest here include channels of transmission as well as volatility of flows. For human capital development, its introduction into economic growth models in the 1980s has seen the emergence of, and even still evolving, several studies with varied interests and focus. Most of these studies give attention to the channel of impacting on economic growth with three such identified. These are final goods production, innovation and imitation and combination of both.

However the foreign direct investment and human capital development nexus has received limited attention. This is particularly so for country-specific studies even though their individual contributions to economic growth is well articulated as observed earlier. The few available ones are cross-section studies. Moreover most of them are of single equations with a few simultaneous equations studies which did not consider the time series characteristics of the data and the likelihood of generating 'spurious estimation results'. This study proposes to take the above shortcomings into consideration by conducting studies for Nigeria using the Vector Auto Regression procedure of Impulse Response Function (IRF). The rest of the study is structured as follows. Section

2 is the literature. In section 3 is contained trend in human capital development and foreign direct investment in Nigeria, respectively. Section 4 is the model, methodology and data sources. Sections 5 and 6 comprise the empirical analysis and summary and conclusion.

THE LITERATURE

The role of foreign direct investment and human capital development in economic growth and development as well as their nexus are two different issues. While the former has received considerable attention in the literature, the latter's exploration is still relatively limited. Studies articulating the contributions of foreign direct investment and human capital as well as its development to economic growth and development are a legion. For foreign direct investment some recent studies include Bashir (2006), Kyaw (2003), Carkovic and Levine (2004), Ghatak and Halicioglu (2006), Alfaro *et al.* (2007), Sharman and Abekah (2007), Tang *et al.* (2008) and Al-Iriani and Al- Shamsi (Undated). The literature for human capital development includes Lucas (1988), Romer (1990), and Mankiw *et al.* (1992) among the early ones for human capital *development.* Others include Azariadis and Drazen (1990), Barro and Lee (1993), Benhabib and Spiegel (1994), Islam (1995), Appleton and Teal (1998), Pritchet (1999), de la Fuente and Domenech (2000), (Simoes, 2000 and Izushi and Huggins (2004).

On the role of foreign investment in economic growth, the general consensus is that the former promotes the latter. The reason being that foreign investment increases 'investible resources and, *importantly,* capital formation' (Kyaw, 2003). This is in addition to the fact that it transfers the technique of production, innovation, organisation and management skills and improved access to

international markets. This is true particularly for the direct investment component of foreign investment via 'spillover benefits'. However this is dependent on the existence of favourable and conducive environment. The wave of globalisation as it affects all aspects of a nation's economy is among the factors. Others include hospitable regulatory framework, market size, risk of nationalisation, investors' view of economic performance, export orientation, macroeconomic policy reform, greater technological spillovers, and increasing financial links across countries and so on. In the matter of channels of transmission, Bashir (1999) observes that models of "endogenous" growth have recently been combined with that of diffusion of technology in an attempt to emphasise the major role played by foreign direct investment. According to the models, technology plays a crucial role in economic development process. In addition, extensions of the neoclassical models allow for international mobility of capital and technology. He also drew attention to the issue of volatility of foreign direct investment flows and the need for important and necessary macroeconomic and financial adjustments. There is evidence of bi-directional causality between foreign direct investment and economic growth and that foreign direct investment compliments domestic investment to promote economic growth rather than crowd it out (Tang *et al.*, 2008).

Human capital *development* as a factor in economic growth has received considerable attention since its introduction as an input in growth models in the 1980s. Studies in this regard include Lucas (1988); Romer (1990) and Mankiw *et al.* (1992). There is natural interest in the channels of impacting on economic growth for which the studies have identified three; final goods production, innovation and imitation and a combination of both. The first channel assumes

that human capital does not engage in research and development activities but in direct production of final goods thus assuming a Cobb-Douglas production function. The second case considers human capital to be involved as an input in technology production not final goods production. It also assumes a Cobb-Douglas production function. The third case makes no distinction between the kind of human capital used in final goods production and research and development activities (Simoes, 2001). The relative importance of the variable in the growth process has also received attention in studies by Azariadis and Drazen (1990); Barro and Lee (1993); Benhabib and Spiegel (1994); Islam (1995); Pritchett (1999) and de la Fuente and Domenech (2000) among others. (Simoes, 2001). There is a general consensus which suggests that human capital development is an important variable in growth and development process.

Miyamoto (2003) presents a review of some of the existing literature on the foreign direct investment and human capital development nexus in some developing countries in Latin America, Asia and Africa. The conclusions of the studies underscore the importance of the latter in influencing the former as a necessary but not a sufficient condition as other factors play decisive role. The study synthesised cross-country studies covering the periods 1960 to 1980s and 1980 to mid-1990. It points out that while cross-country studies highlight the importance of human capital development in foreign direct investment inflow; inconsistencies in the definition of explanatory variable may plague the results. The study observes the dearth of country-specific studies necessary to reduce the bias. The few available ones focused on the impact of human capital development on foreign direct investment flows without giving

consideration to the possibility of simultaneity in their relationship. Complementarily, foreign direct investment positively impact on human capital development through education and training, introduction of new skills, information and technology to the host country. This complementarity effect leads to a virtuous circle of human capital development and foreign direct investment with the host country experiencing continuous inflow of foreign direct investment and development of its human capital.

The obvious from above is a dearth of studies on the response of human capital development to foreign direct investment and vice versa. The available studies also did not take into consideration the possible existence of a simultaneous relationship as well as the empirical characteristics of the variables' data.

TRENDS IN FOREIGN DIRECT INVESTMENT FLOWS AND HUMAN CAPITAL DEVELOPMENT INVESTMENT FLOWS IN NIGERIA

According to Ekpo (1997) one of the earliest types of resources transfer to developing economies is foreign private investment inflow. This had become desirable in view of the dearth of capital that characterised the development drive of these countries shortly after political independence. The existing resource gap called for resources' inflow in order to build up the stock of capital. Prior to this however the motivation for capital inflow to developing countries was imperial expansion and the establishment of overseas subsidiaries of home trading companies. Later one or a combination of the following became the inspiration; market, natural resources efficiency and strategic asset-seeking (Kregel, 1994; Anyanwu, *et al.* 1997 and Odusola, 2002).

There is evidence of increased foreign resources' flow to developing countries especially in the 1980s. The concentration of the increase however is in favor of Chile, Malaysia, Poland, South Korea, and Thailand among fifteen emerging economies in East Asia, Latin America and Europe. All of these countries account for a very substantial proportion of foreign investment flow. Sub-Saharan Africa, including Nigeria, accounts for a paltry 2%. (World Bank, 2000; Kyaw, 2003). For Africa it is obviously inadequate to induce the expected impact. Shortcomings in foreign investment policies are among the reasons adduced for the low inflow according to the literature. For Nigeria in particular, foreign direct investment has shown an unsteady trend in the period under consideration just like human capital development. Between 1970 and 2005, growth in foreign direct investment flow averaged 44%. In the era before Structural Adjustment, the flow to Nigeria was very poor with an average of -4.3%; indicative of disinvestment. The Post-SAP era show improvements with about 11% growth. In all 13 episodes of negative growth was observed; 7 and 6 for pre and post-SAP eras respectively.

As alluded to earlier on, human capital development is crucial to economic growth and development and has also been described as an end or objective of development. It can lead to the attainment of the potential of a people by enlarging their capabilities. It necessarily calls for the empowerment of people, thereby enabling them to contribute to the development process. Human capital development enhances skills, knowledge, productivity and inventiveness of people through a process of human capital formation broadly conceived. The process is a people-centered strategy, and

not goods centered or production-centered strategy of development. (Ogujiuba and Adeniyi, Undated).

The Nigerian government recognizes the role played by human capital in the production process. Indeed in one of its recent policy documents, the National Economic Empowerment and Development Strategy (NEEDS), it recognizes the centrality of human capital development in attaining the objective of economic growth. The level of educational attainment is a key indicator of human capital development. There is evidence of a high positive relationship between rise in educational expansion/attainment and economic development. One widely accepted indicator of human capital development/formation is secondary school enrolment. This level of education is mainly the responsibility of state governments although there is some level of involvement by the Federal Government. There is collaboration by private individuals, religious organisations, international agencies, non-governmental organisations (NGOs) and community-based organisations (CBOs) to provide this level of education.

However over the years, in particular the period under consideration in this study, human capital has shown an unsteady trend in its development. In 1980, secondary school enrolment was about 2 million in 1980 and rose to 3 million in 1984. In 1989, enrolment declined to 2.7 million. It rose to 2.9 million in 1990. From 1990, enrolment rose though unsteadily to reach 6.5 million in 2003. In percentage terms, between 1970 and 2005, development of human capital in terms of secondary school enrolment averaged 15.3%. In the period before Structural Adjustment, enrolment was in the average of 17.2% as against post SAP 7.9%. (See table 1 below). Obviously the downturn in the Nigerian economy and the subsequent

structural adjustment/reform programme tended to discourage human capital development given the level of impoverishment that followed in the wake of the adoption of reform as many children could not enroll for school.

However Ogujiuba and Adeniyi (Undated) note that in spite of the expansion in the educational opportunities, there were structural defects, inefficiency and ineffectiveness which affected Nigeria's level of human capital development and utilisation. This no doubt has implications for the trend and general economic development and by extension foreign direct investment.

Table 1: **Trend in Human Capital Development and Foreign Direct Investment in Nigeria**

Period	Foreign Direct Investment (%Change)	Human Capital Dev. (%Change)
1970-1975	23.8	15.9
1976-1979	-2.2	22.0
1980-1985	-17.0	13.7
1986-1989	245.2	0.6
1990-1995	68.7	11.0
196-1999	6.8	4.7
2000-2005	33.1	15.3
Overall Average	44.0	11.9
Pre-Reform Average	4.3	17.2
Post-Reform Average	11.0	7.9

Source*:* Calculated from Central Bank of Nigeria's Statistical Bulletin (2005), National Bureau of Statistics' Annual Abstract of Statistics (2006), World Bank's Africa Development Indicators (2006) and UNCTAD's World Investment Report (2007).

MODEL, METHODOLOGY AND DATA SOURCES

The model showing the relationship between human capital development and foreign direct investment is specified as;

$$FDI_t = \alpha_{1t} + \sum_{j=1}^{k}\beta_{1t}HCD_{t-j} + \sum_{j=1}^{k}\lambda_{1t}FDI_{t-j} + \sum_{j=1}^{k}\theta_{1t}RGDP_{t-j} + U_{it} \quad (1)$$

$$HCD_t = \alpha_{2t} + \sum_{j=1}^{k}\beta_{2t}HC_{t-j} + \sum_{j=1}^{k}\lambda_{2t}FDI_{t-j} + \sum_{j=1}^{k}\theta_{2t}RGDP_{t-j} + U_{it} \quad (2)$$

$$RQDP_t = \alpha_{3t} + \sum_{j=1}^{k}\beta_{3t}HCD_{t-j} + \sum_{j=1}^{k}\lambda_{3t}FDI_{t-j} + \sum_{j=1}^{k}\theta_{3t}RGDP_{t-j} + U_{it} \quad (3)$$

Where FDI_t = log-changes in foreign direct investment over time, HCD_t = log-changes in human capital development over time, (proxied by secondary school enrolment), RQDP = log-changes in real Gross Domestic Product (proxy for economic growth) over time, FDI_{t-1} and HCD_{t-1} are lagged values of log-changes in foreign direct investment and human capital development respectively, (j =1,2,3), k = total number of lags, α = autonomous term, β = coefficient of human capital development, λ = coefficient of foreign direct investment, θ = coefficient of real Gross Domestic Product, U_{it} = stochastic error term.

The above model is based on the premise that human capital development, foreign direct investment and other macroeconomic variables are simultaneously inter-related. For the sake of compactness and tidiness, other macroeconomic variables are represented by real Gross Domestic Product (proxy for economic growth) as it is assumed to mirror their collective impact and

transmits same through the accelerator effect (Mlambo and Oshikoya 1999; Edo, 2007).

Empirical Analyses

The Vector Auto-Regression (VAR) procedure of Impulse Response Function was utilized in this study to determine the response of human capital development to changes in foreign direct investment inflow to Nigeria and vice versa over a given time horizon. The study also takes into consideration the existence of simultaneity in relationship.

The study used data covering the period 1970-2005 which were obtained from published sources. These include publications of Central Bank of Nigeria (Statistical Bulletin and Annual Report and Statement of Accounts), National Bureau of Statistics (Annual Abstract of Statistics), World Bank (World Development Indicators), International Monetary Fund (International Financial Statistics), African Development Bank (Pocket Statistics Books) and others.

The MFIT 4.1 econometric software was used to analyse the data and the results are presented and discussed in this section beginning with unit root test results.

Unit Root Test

In VAR modeling procedure, unit root test is conducted on the data of variables in a model to determine their time series characteristics. This is desirable to avoid generating spurious results. Following this rule, the results of the unit root test conducted are presented in table 2 below and discussed thereafter.

Table 2: Unit Root Test of Variables

Variable	ADF
InHCD	-1.9077*
InFDI	-2.4506*
InRQDP	-1.2274*
DInHCD	-4.9938**
DInFDI	-6.0133**
DInRQDP	-3.5581**

* -3.5468 Critical Value; ** -3.5514 Critical Value.

The result in the table above shows that all the variables failed the test in their levels as the absolute values of the ADF statistics for all of them are less than the critical value. The implication of this is that the variables are non-stationary and thus likely to generate spurious result in the event of using them as they are to estimate the model. However on differencing once and repeating the test, all the variables passed the test when the absolute values of the ADF statistics are compared to the critical value. In other words the data of the variables are of the order 1(1).

Cointegration Test

A second procedural step in VAR is cointegration test to determine the existence of a long-run relationship between the variables in the model. This was done and the results are as presented in table 3 below and also discussed thereafter.

Table 3 Cointegration Test Result

Model	No. of Coint. Relations (r)	Max. Test	95% Critical Value	Trace Test	95% Critical Value
Equation 1	R = 0 R ≤ 1 R ≤ 2	36.86 16.03 9.60	21.12 14.88 8.07	62.48 25.62 9.60	31.54 17.86 8.07
Equation 2	R = 0 R ≤ 1 R ≤ 2	35.78 10.89 2.88	17.68 11.03 4.16	49.57 13.78 2.88	24.05 12.36 4.16
Equation 3	R = 0 R ≤ 1 R ≤ 2	36.86 16.03 9.60	21.12 14.88 8.07	62.48 25.62 9.60	31.54 17.86 8.08

As the cointegration test results show the null hypotheses of 'no cointegrating relationship' among the variables in the three equations are rejected at 5% level of significance. The test statistics, maximal eigenvalues and trace test, complement one another to confirm the existence of at least two cointegrating relationships for all the equations in the model. The implication of the two tests conducted above is that the variables in the model possess the required empirical characteristics that will enable us to include them in the VAR procedure.

The Impulse Response Procedure

Considering that satisfactory results were obtained from the unit root and cointegration tests, the variables were admitted accordingly in the estimation process using the Impulse Response procedure of VAR. This enabled us to determine the response of the dependent variables to the exogenous in the model specified above.

Prior to this, an estimation of an over-parameterised model, first using six (6) lags for each variable in each equation, was done. The variable redundancy test was used to eliminate the redundant variables and in the process an optimal lag of three (3) was selected. The resultant Impulse Response Function estimates are presented and discussed below while the graphs are presented in the appendix.

Table 4a: Orthogonalised Impulse Responses to one SE shock in the equation for DINFDI
Unrestricted Vector Autoregressive Model

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Based on 32 observations from 1974 to 2005. Order of VAR = 3
List of variables included in the unrestricted VAR:
DINHCD DINFDI DINRGDP
List of deterministic and/or exogenous variables:
INPT

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Horizon	DINHCD	DINFDI	DINRGDP
0	0.00	1.1952	-.023910
1	.043677	-.80962	.035576
2	-.021057	.25663	-.014288
3	.0052444	-.034267	.0029911
4	-.2256E-3	-.011699	.1487E-3
5	-.4733E-3	.0093460	-.3925E-3
6	.2486E-3	-.0031950	.1738E-3
7	-.6817E-4	.5058E-3	-.3943E-4
8	.5066E-5	.1073E-3	.1486E-6
9	.4906E-5	-.1068E-3	.4354E-5
10	-.2950E-5	.3936E-4	-.2061E-5
11	.8580E-6	-.7159E-5	.5244E-6
12	-.9411E-7	-.8853E-6	-.2017E-7
13	-.5118E-7	.1206E-5	-.4580E-7

14	.3395E-7	-.4809E-6	.2484E-7
15	-.1096E-7	.9799E-7	-.6619E-8
16	.1417E-8	.5646E-8	.5439E-9
17	.4799E-9	-.1346E-7	.4986E-9
18	-.3999E-9	.5813E-8	-.2856E-9
19	.1334E-9	-.1314E-8	.0000
20	.0000	.0000	.0000
21	.0000	.0000	.0000
22	.0000	.0000	.0000
23	.0000	.0000	.0000
24	.0000	.0000	.0000
25	.0000	.0000	.0000

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Table 4b: Orthogonalised Impulse Responses to one SE shock in the equation for DINHCD

Unrestricted Vector Autoregressive Model

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Based on 32 observations from 1974 to 2005. Order of VAR = 3
List of variables included in the unrestricted VAR:
DINHCD DINFDI DINRGDP
List of deterministic and/or exogenous variables:
INPT

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Horizon	DINHCD	DINFDI	DINRGDP
0	.10490	-.13889	-.014949
1	.022801	-.23236	-.0084854
2	.0013646	.14049	-.011893
3	.0058424	-.036680	.1939E-3
4	.1607E-3	.0040586	-.0011398
5	.3097E-3	.0027580	-.3338E-3
6	.2091E-3	-.0015138	-.2904E-4
7	.3010E-5	.5143E-3	-.6415E-4
8	.2573E-4	-.4705E-4	-.7985E-5
9	.5645E-5	-.2154E-4	-.4456E-5

10	.1165E-5	.1993E-4	-.2583E-5
11	.1267E-5	-.5550E-5	-.3184E-6
12	.1586E-6	.1072E-5	-.3112E-6
13	.1115E-6	.3124E-6	-.8890E-7
14	.4840E-7	-.1872E-6	-.2304E-7
15	.8160E-8	.8452E-7	-.1566E-7
16	.6705E-8	-.9333E-8	-.3290E-8
17	.1710E-8	-.8967E-9	-.1574E-8
18	.5715E-9	.2871E-8	-.6633E-9
19	.3154E-9	-.7572E-9	-.1594E-9
20	.0000	.2378E-9	.0000
21	.0000	.0000	.0000
22	.0000	.0000	.0000
23	.0000	.0000	.0000
24	.0000	.0000	.0000
25	.0000	.0000	.0000

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Table 4c: Orthogonalised Impulse Responses to one SE shock in the equation for DINRGDP
Unrestricted Vector Autoregressive Model

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Based on 32 observations from 1974 to 2005. Order of VAR = 3

List of variables included in the unrestricted VAR:

DINHCD DINFDI DINRGDP

List of deterministic and/or exogenous variables:

INPT

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Horizon	DINHCD	DINFDI	DINRGDP
0	0.00	0.00	.053007
1	-.0060964	-.30873	.023021
2	-.014721	.13599	-.0020682
3	.0012685	-.035614	.0038612
4	-.0013511	.5889E-3	.3479E-3
5	-.3526E-3	.0030407	.1306E-3
6	.2240E-5	-.0017303	.1624E-3
7	-.7737E-4	.4186E-3	.4067E-5
8	-.5192E-5	-.3907E-4	.1539E-4
9	-.4387E-5	-.3737E-4	.5017E-5
10	-.2937E-5	.1842E-4	.6019E-6
11	-.1621E-6	-.6095E-5	.8759E-6
12	-.3494E-6	.4014E-6	.1408E-6
13	-.8851E-7	.2921E-6	.6545E-7
14	-.1932E-7	-.2506E-6	.3684E-7
15	-.1758E-7	.6357E-7	.5745E-8
16	-.2813E-8	-.1192E-7	.4378E-8
17	-.1605E-8	-.4511E-8	.1353E-8
18	-.7054E-9	.2273E-8	.3630E-9
19	-.1377E-9	-.1030E-8	.2226E-9
20	.0000	.0000	.0000
21	.0000	.0000	.0000
22	.0000	.0000	.0000
23	.0000	.0000	.0000
24	.0000	.0000	.0000
25	.0000	.0000	.0000

The results presented above are the Impulse Response of the endogenous to one unit (SE) shock in the exogenous variables in equations of the model. The forecast horizon used in this study for the three equations is 25 years. Generally the results show that a unit shock in the exogenous variables has very little impact on the endogenous and such impact die out very quickly; under 20 years.

In table 4a, with FDI as the endogenous variables, the result shows a mix of impact with the positive and negative cases almost even for all the variables. While the HCD variable did not impact on FDI in the current period, the impact of the lagged values of FDI was very profound. The third variable, RGDP impacted negatively in the same period. The variable HCD generated equal number of positive and negative impacts on FDI. The lagged values of FDI reported 10 and 9 cases of negative and positive impacts respectively while the reverse order was the case for RGDP. In this case the horizon of impact is the same for all the exogenous variables.

In table 4b, the endogenous variable is human capital development (HCD) while its lag and those of FDI and RGDP are the exogenous variables. The exogenous variables have a mix of positive and negative impact on the endogenous. While the lag of HCD impacted positively throughout the horizon, the other two variables and their lags as admitted in the estimation had both positive and negative impacts. In particular, the result suggests that HCD contributed to its own further development. The FDI has an almost even number of both positive and negative, 10 and 11 responses respectively. On the average one can hazard the conclusion that during the period under consideration, FDI adversely affected human capital development. The RGDP reported 19 and 1 cases of positive

and negative impacts on human capital development respectively. This is as expected as the increased income consequent on economic growth would have been channeled to funding the development of human capital via increased investment in educational opportunities. It is pertinent to point out that FDI though marginal in adversely affecting human capital development it outlasts the others in impacting on HCD by one period.

For table 4c, the estimate for RGDP equation, the endogenous variable, output did not respond to HCD and FDI in the current period. In the successive periods it responded both positively and negatively over the horizon. There are 17 and 2 positive and negative cases of response respectively to HCD shock, almost and even number for FDI and 19 and only 1 case for the lags of RGDP. Again the horizon of impact is the same for all the exogenous variables.

Summary and Conclusion

Developing her human capital, attracting foreign direct investment and growing the economy are among major policy preoccupation in Nigeria. The attainment of these goals appears to be difficult with shocks in their trend. The shocks are occasioned by factors such as changes in the economy, global integration, policy shifts and structural adjustment/reform and so on. In this study attempt was made to determine the impact of human capital development on foreign direct investment and vice versa using the VAR methodology procedure of Impulse Response Function (IRF). Generally, the estimation results revealed that the effects are generally marginal and mixed.

In particular, the estimation results from the IRF showed that foreign direct investment did not improve human capital development in Nigeria while the latter on the other hand had no considerable impact on the former. The study also shows that while the lag of human capital development has marginal impact on its value in the current period that of foreign direct investment was of considerable impact. It is therefore important for the country to articulate an appropriate policy to manage its foreign direct investment in other for it to encourage and attract the inflow of same in succeeding periods.

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