

Determinants of Fixed Foreign Direct Investment in Botswana

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Abstract: In this article, we explain the determinants of foreign direct investment in Botswana for the period 1980–2007. The government of Botswana has over the years provided investment incentives to attract foreign direct investment (FDI) into the country but, despite these efforts, FDI has continued to be relatively low and skewed towards mining, especially diamond mining. Recent literature on investment is silent on the impact of economic growth rates on FDI inflows in developing countries such as this one. We examined economic variables that determined FDI in Botswana, and our study used the accelerator theory of investment to uncover the effects of FDI on the nation's economy. The dependent variable, FDI is expressed as a function of GDP growth rates, human capital, terms of trade, domestic investment, and government expenditure. We used time series annual data from Botswana Central Statistics Office (CSO) and employed both the co-integration and vector error correction model to find the short-term and long-term effects of FDI. The econometric results showed that economic growth rates better explains FDI flows in Botswana. The significance of economic growth is consistent with the acceleration theory of investment. This finding confirms that the accelerator theory is useful as a policy tool for planning investment outlay in developing countries. The findings are also useful for policy-makers in shading light on investment determinants that could be employed to achieve more FDI in Botswana.

Keywords: *Foreign direct investment, Botswana, accelerator theory, economic growth rates, mining sector*

1. Introduction

At independence in 1966, Botswana had an annual per capita income of USA \$100 and was regarded as one of the 10 poorest countries in the world (UNCTAD, 2003). Agriculture contributed about 40% to GDP and was the main source of income and employment. In the years, following independence Botswana depended on foreign aid for most of its capital and recurrent budget. The discovery and exploitation of copper, nickel and diamonds in the 1970s, increased FDI inflows and, after the three decades of rapid economic growth that followed, Botswana had become an upper-middle-income developing economy with a per capita income of US \$ 3 312 (MFDP, 2003; UNCTAD, 2003). Economic growth was mainly driven by mineral revenues from diamonds, and the income obtained from mineral sales was invested in health, education and infrastructure (UNCTAD, 2006). In an effort to encourage FDI, the government of Botswana developed investment incentives (MFDP, 2003). These include a stable political environment and good governance, a stable exchange rate and macroeconomic policies, good labor relations, low rates of tax and of corruption, low crime levels, and trade agreements with several countries to provide free access to goods produced in Botswana (MFDP, 1997). However, the main source of FDI, export earnings, and government revenues and the largest contributor to gross domestic product (GDP) is still the mining sector, especially in diamonds. Therefore, to sustain and/or improve economic growth rates over time it is important for the government of Botswana to pursue policies that will diversify the economy away from minerals, as the diamonds are non-renewable resources and their prices are subject to exogenous economic shocks. During the 2008 economic recession, for example, the price of diamonds significantly reduced which adversely affected government revenues.¹ Most of the studies on FDI in less developed countries show that FDI was influenced by, among other variables. GDP levels, infrastructure, and degree of openness, exchange rate, and government regulations, market size, education, and labor costs (Demirhan and Masca, 2008; Dhakal, Mixon and Upadhyaya, 2007; Na and Lightfoot, 2006). The role played by economic growth rates in promoting FDI has not been covered in previous studies. In this paper, we fill this gap identifying variables that influence FDI. FDI need to flow in all

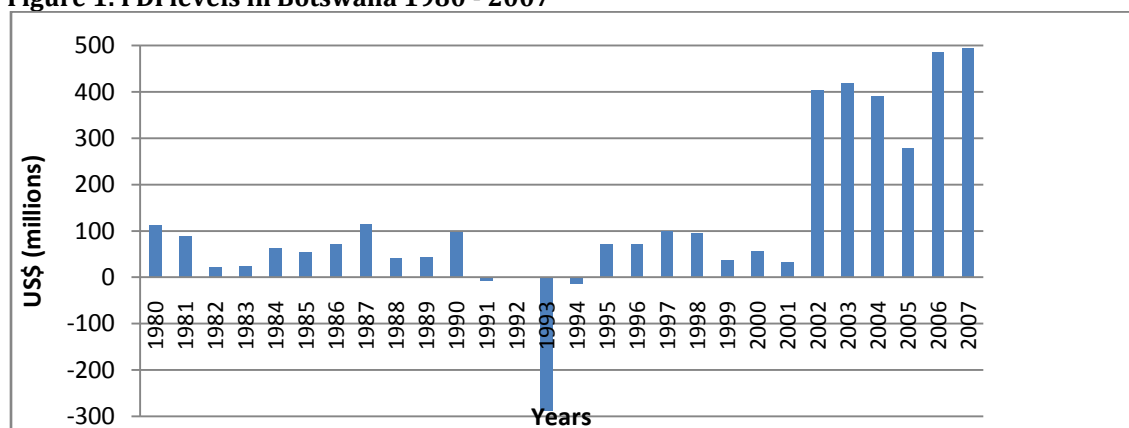
¹ Botswana Ministry of Finance, 2008

sectors of the economy rather than in primary commodities such as those in mining sector. According to UNCTAD (2004), Botswana has a high FDI potential compared to other African developing countries. An improved economic growth rate was likely to attract more FDI. This in turn, would result in technology transfer, spillovers in productivity and improved competitiveness among, domestic and foreign companies (Cave, 1974), further stimulating economic growth. In addition, the study confirms the applicability of the accelerator theory of investment to developing countries. The findings, therefore, will assist the government of Botswana and other developing countries in formulating appropriate FDI policies.

2. Literature Review

In an attempt to diversify the economy from dependence on a non-renewable mineral resource, such as diamonds the government established the Botswana Export Development and Investment Authority (BEDIA) by act of Parliament No 23 of 1997 to be the focal point of investment and export activities and to diversify and industrialize the economy (MFDP, 1997). Despite the governments' best efforts, however, Botswana still experiences the problem of low levels of FDI. To raise these levels the government chose to liberalize the economy, and the discovery of minerals (diamonds, copper-nickel, and soda ash) after independence increased Botswana's attractiveness to FDI (Siphambe, 2005). A further attraction was Botswana's sound macroeconomic management of the economy, which has helped the government to control expenditure and build up foreign reserves for many months of imports cover (Sentsho, 2000). In addition, the main objective of monetary policy was to achieve a sustainable low inflation rates and a competitive real exchange rate (MFDP, 2003). The management of the exchange rate is one of the strategies to attract FDI. Another was the country's removal of all exchange controls in 1999 to allow free repatriation of profits, dividends and capital (MFDP, 2009), with the aim of increasing Botswana's competitiveness and FDI. Botswana's tax regimes are also directed at increasing competitiveness and FDI. Its corporate tax rates are the lowest in the SADC region at 15% for all manufacturing companies and International Financial Service Centre (IFSC) companies, and 25% for other non-manufacturing companies. The 15% manufacturing tax comprises 10% additional tax and 5% basic company tax. The main reason for the low taxes is to encourage both local and foreign firms to invest in a way that achieves economic diversification, and thereby more FDI (Sentsho, 2000; BEDIA, 2010). Botswana's estimated 1.7 million people live mostly in rural areas (CSO, 2008), so the domestic market for goods and services is small, which has led the government to enter various bilateral and international trade agreements to expand the market base. These agreements include the Southern African Customs Union (SACU), Southern African Development Community (SADC), Protocol on Trade Cooperation, the Contonou Agreement and the World Trade Organization (WTO). Botswana received more FDI than other SADC countries, for example in the period from the 1970s and 1980s (see, Figure 1). From the 1990s, the share of FDI inflows fell considerably, especially between 1991 and 1994, with the country experiencing its lowest FDI flows in 1993. From 1995 to 2007, investment inflows improved. A review of the literature shows that in the period between 1980 and 2007 Botswana experience the problem of low levels of fixed investment and dependence on mineral resource to attract FDI inflows.

Figure 1: FDI levels in Botswana 1980 - 2007



Source: UNCTAD online database, 2010

Problem statement, Objectives and research questions: Problem statement: Despite the efforts to encourage FDI in Botswana, the amount of FDI has continued to be relatively low. Notably FDI in Botswana is still directed towards mining and the country has not been able to diversify its spread successfully to other sectors of the wider economy. In effect, FDI in Botswana declined significantly in the period between 1988 and 1990 (UNCTAD, 2003). As a consequence, the economic growth rate of 12% in the two decades following independence slowed down to single digit number in the 1990s (UNCTAD, 2006). The purpose of this paper is to explain, in particular, the impact of economic growth rates, on FDI inflows in Botswana. The objectives are twofold: the first is to investigate the variables that influence FDI in Botswana. To this end, we attempt to answer the following questions: are low levels of FDI due to economic growth rates? Are low levels of FDI due to low levels of human capital? Do government expenditures influence FDI? Is it unfavorable terms of trade that prevent FDI inflows to Botswana? Second, is the accelerator theory applicable in developing countries like Botswana? The answers to these questions will assist the government of Botswana to formulate investment policies that might attract FDI, and assist in the effort to diversify the economy from dependence on minerals. We employ the flexible accelerator theory of investment and other variables to assess their impact on FDI in Botswana, and a time series regression equation to estimate the variables. The co-integration test was carried out to determine whether there is a long-term relationship between FDI and independent variables included in our model. The paper has seven sections: Section One serves as the introduction; Section Two presents the background, a brief overview of Botswana FDI policy and investment flows; Section Three gives the literature review; Section Four presents the methodology, data and statistical techniques employed in the paper; Section Five presents empirical results and analysis; Section Six presents discussion; and Section Seven gives the conclusion.

Literature of Survey: In this section we review related empirical studies in both developed and developing countries that have dealt with issues of FDI inflows, in particular the theories and methods employed, and we identify and review current contributions in the field of FDI. We define investment as the amount spent by businesses or individuals to add to stock of fixed capital over a given period. Firms invest to make profits; they invest where the expected returns exceed the capital that was used to acquire the investment (Pratten, 1990; Malinvuad, 1998). Several studies of investment have used the flexible accelerator theory of investment to investigate the determinants of FDI in the economy. The flexible accelerator investment model states that if the gap between existing capital and the desired capital stock is large, the firm's rate of investment will increase. The investors would want to close the gap between desired capital stock and the actual capital stock for every period (Asante, 2000; Erden and Holcombe, 2005). The flexible accelerator model can be developed from the capital stock relationships as;

$$I = \delta (K^* - K_{-1}) \quad (3.1)$$

Where:

I = net investment

δ = partial adjustment coefficient

K^* = desired capital stock

K_{-1} = last period's capital stock

The acceleration investment model assumes that the desired capital stock (K^*) is proportional to the level of output, as given in the equation (2.3) below;

$$K_t^* = \alpha Y_t \quad (3.2)$$

Where:

K_t^* = desired capital stock in period t

α = fixed capital/output ratio

Y_t = expected level of output in period t

In the flexible accelerator investment model, actual capital stock is always adjusted to desired capital stock in each period, which implies that $K_t^* = K_t$ (Turner, 1993; Du Toit and Moolman, 2004; Erden and Holcombe, 2005). In addition, output, internal funds, cost of external financing and other variables are included as determinants of the desired capital in the flexible accelerator investment model (Chirinko, 1993; Romer, 2006).

$$Y = \text{growth in GDP} = (\text{GROWTH}) \quad (3.3)$$

Substituting (3.3) in (3.2) and letting desired capital stock $K_t^* = (INV/Y)^*$ we obtain:

$$(INV/Y)^* = \alpha GROWTH \quad (3.4)$$

Where: INV = gross domestic fixed investment

Equation (3.4) states that the growth in desired investment in any given period is a proportion of growth in GDP.

The partial adjustment equation implies that the gap between desired investment and actual investment is not fully covered at any given time and is given as:

$$\Delta (INV/Y)_t = \lambda [(INV/Y)^* - (INV/Y)_{t-1}] \quad (3.5)$$

Where λ = coefficient of adjustment. Equation (3.6) states that net investment is equal to desired investment less actual investment, and is partially covered by λ . The acceleration model of investment allows economic conditions to influence the adjustment coefficient λ as shown below:

$$\lambda = \beta_0 + (\beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots) / [(INV/Y)^* - (INV/Y)_{t-1}] \quad (3.6)$$

Where X is the variable that affect λ ; $i = 1, 2, 3, \dots, n$ and β are coefficients.

There are many empirical studies on FDI in both developed and developing countries. Using Ordinary Least Squares (OLS) Na and Lightfoot (2006) examined the determinants of FDI at regional level in China during the critical year of 2002; the year after China exceeded the USA in attracting FDI. The authors used five determinants of FDI: GDP (to capture market size), roads (to capture infrastructure development), labor quality (proxy for education), labor costs, and degree of openness (proxy by the percentage of states owned enterprises and FDI). The study found that GDP (market size), labor quality (education) and the degree of openness had significant impact on FDI in the 30 different regions in 2002. Dhakal, Mixon and Upadhyaya (2007) assessed the factors that determine FDI inflows in the former socialist countries of Eastern and Central Europe using OLS for the period 1995-2004. FDI inflows are modeled as a function of the market size (real GDP), inflation, the current account balance of payments, the real exchange rate, openness, and government regulation in the host country. The study found that the real exchange rate, openness of the economy, and deregulation are the primary factors determining FDI inflows in these countries. Confirmation of the foregoing primary factors is found in Demirhan and Masca (2008) after examining the determinants of FDI to developing countries using cross-sectional analysis over the period 2000 - 2004. The study used a sample of cross-sectional data on 38 developing countries. The dependent variable was FDI while independent variables were growth rate of per capita GDP, telephone main lines per 1000 people measured in logs, degree of openness, risk and corporate taxes. The econometric results showed that growth rate of per capita GDP, telephone main lines and degrees of openness, Inflation, and tax rates were statistically significant. Recent studies have attempted to test the direction of causation in FDI modeling, because of the possibility of endogeneity. FDI may have a positive impact on economic growth leading to an enlarged market size, which in turn attracts more FDI. Due to the interdependence of the two variables, researchers found it fit to do a proper test of endogeneity (Asheghian, 2011; Esso, 2010; Karimi and Yusop 2009; Tang, Selvanathan and Selvanathan, 2008).

Fedderke and Romm (2005) studied the determinants of FDI and the impact of FDI on the economic growth in South Africa for the period 1956 - 2003 using the Vector Error Correction Model (VECM). The authors found foreign and domestic capital to be complementary, meaning, therefore, that there is a positive technological spillover from foreign to domestic investment in South Africa over the study period (Caves, 1974). Caves (1974), in his study of FDI in the manufacturing sector of Canada and Australia, asserts that the host country benefits from FDI spillover. He employed a cross-section data and found that FDI increased competitiveness among domestic and foreign firms. Furthermore, the host country benefited from the transfer of technology in that the presence of foreign firms improved technology. In several studies, Dunning (1980, 1988 and 2001) in his eclectic framework asserts that FDI was determined by three features, first, ownership, for example, of assets that will give the investing firm a competitive advantage. Second, location, in this case firms decide to locate investment where they will increase their benefit. Third, investing firms might decide to internalize markets in order to maximize their profits (Dunning, 2001: 175-6). Asheghian (2011) examined the determinants of economic growth in Canada and whether there was a time-series evidence of FDI-led growth hypothesis. He used an assumption of de Mello, on 33-year annual data and estimated using Beach Mackinnon technique. The results indicated that determinants of economic growth in

Canada were total factor productivity and domestic investment growth, and that there was no evidence of causal relationship between FDI growth and economic growth, FDI growth and factor productivity in Canada. Ayanwale (2007) also investigated the empirical relationship between non-extractive FDI and economic growth and examined the determinants of FDI in Nigeria. In order to find these determinants, OLS was employed and Two Stage Least Squares (2 SLS) was used to investigate the relationship between FDI and economic growth. The author found the determinants of FDI in Nigeria to be market size, infrastructure development, and stable macroeconomic policy. Karimi and Yusop (2009) also examined the causal relationship between FDI and economic growth in Malaysia using the Toda-Yamamoto test for the period 1970 - 2005. They found no strong bidirectional relationship between FDI and economic growth. They suggested that the determinants of FDI, which are human capital, level of technology, and productivity, affected the relationship between FDI and economic growth. It also becomes critical to include a dimension that analyses the determinants of FDI using Autoregressive Distributed Lag (ARDL) framework (Shahrudin, Yusop and Satar, 2009). In finding the determinants of FDI in Malaysia for the period 1970 - 2008, FDI was expressed as a function of money supply (to capture financial development), GDP (market size), growth of GDP, government expenditure, openness, exchange rate, corporate tax, inflation rate and crisis (to capture the effects of the Asian crisis of 1998). The study revealed that financial development and economic growth contribute positively to the inflow of FDI in Malaysia.

3. Methodology

Data: As previously mentioned, the purpose of our study was to explain the determinants of FDI in Botswana and to investigate the impact of economic growth rates on FDI in Botswana. Time series annual data were used to estimate FDI against gross domestic product growth rates (GDPGR), human capital (HC), government expenditure (GOE: proxy for infrastructure), terms of trade (TOT: proxy for openness) and domestic investment (DI) covering the period 1980 - 2007. The sources of the annual data were Botswana Central Statistics Office (CSO) and United Nations Conference on Trade and Development (UNCTAD) online statistics.

Model and variables: Our study used the flexible accelerator theory of investment and other variables to address its purpose. We adopted a model developed by Demirhan and Masca (2008). Our model differs from theirs in that it includes other variables, absent from the Demirhan and Masca model, including government expenditure, economic growth rates and domestic investment. However, the telephone main lines per 1,000 people and composite risk rating variables used by Demirhan and Masca (2008) are excluded from our models, as it is difficult to obtain the relevant data in Botswana. The functional form of FDI model is given as:

$$FDI/GDP = f(GDPGR, HC, TOT, DI, GOE) \quad (1.1)$$

Where FDI/GDP is, the dependent variable and the explanatory variables are: GDP growth rates (GDPGR), human capital (HC), terms of trade (TOT), domestic investment (DI) and government expenditure (GOE). The linear form of equation (1.1) is specified below as;

$$(FDI/GDP) = \beta_0 + \beta_1 GDPGR_t + \beta_2 HC_t + \beta_3 TOT_t + \beta_4 (DI/GDP)_t + \beta_5 (GOE/GDP)_t + \varepsilon_t \quad (1.2)$$

where; FDI/GDP , dependent variable is FDI as a ratio of GDP (hereafter: FDI/GDP), and the explanatory variables are (GDPGR), (HC), (TOT), (DI/GDP), GDP (GOE/GDP), error term (ε) and the time t .

Equation (1.2) can be further presented in the log linear form as:

$$\text{Log}(FDI/GDP)_t = \beta_0 + \beta_1 \text{log}GDPGR_t + \beta_2 \text{log}HC_t + \beta_3 \text{log}TOT_t + \beta_4 \text{log}(DI/GDP)_t + \beta_5 \text{log}(GOE/GDP)_t + \varepsilon_t \quad (1.3)$$

Equation (1.3) is estimated to determine the influence of independent variables on FDI/GDP , the dependent variable. Since FDI is influenced by many factors (Dunning, 2001), the availability of data was important in the choice of variables to include in our model. Inflation and exchange rate were omitted, due to their weak long-term effect on FDI in Botswana. Finally, on a priori the signs of GDPGR, GOE (proxy for infrastructure) are expected to be positive, while that of HC, DI and TOT (proxy for openness) are expected to be negative in the case of Botswana.

Data stationary test: Since time series data follow a random walk, which is an attribute of non-stationary data, the testing procedure starts by checking whether data are stationary or non-stationary. Therefore, if the data were found to be non-stationary, they were transformed into stationary data to avoid spurious

regression (Verbeek, 2000). The following time series tests were carried out: unit root, co-integration, and the results are analysed below.

4. Data Analysis

The study employed the Dickey-Fuller test (1979) to check whether the time series variables were stationary or non-stationary. As a standard procedure, the Augmented Dickey-Fuller (ADF) was applied to time series variables in levels and first differences to check for stationarity (Gujarati, 2003). The ADF equation is defined as:

$$\text{ADF: } \Delta X_t = \beta_0 + \beta_1 t + \beta_2 X_{t-1} + \sum \beta_k \Delta X_{t-k} + \varepsilon_t \quad (1.4)$$

The objective is to test for stationarity of β_2 in the ADF equation. In carrying out the ADF test, the study used the p-values ($\text{Pr} < \text{Tau}$) of the ADF test statistics (tau) for the variables at levels. If the p-values ($\text{Pr} < \text{Tau}$) of the ADF test statistics (tau) for the variables are greater than 0.05 (at 5% level of significance), then we do not reject the null hypothesis leading to the conclusion that the variables were non-stationary at level. The results indicated that: FDIGDP, GDPGR, HC, TOT, DIGDP and GOEGDP variables were non-stationary and thereby differencing was carried out to achieve stationary. The ADF test results showed that the probability of p-values ($\text{Pr} < \text{Tau}$) of the ADF test statistics (tau) for differenced variables: FDIGDP, GDPGR, HC, TOT, DIGDP and GOEGDP were less than 0.05 (at 5% levels of significance). Therefore, we rejected the null hypothesis and concluded that the above stated differenced variables were stationary and of order I (1).

Co-integration test: Co-integration was carried out to determine the long run equilibrium effects of the explanatory variables on FDI. In order to draw the long-term equilibrium relationship among the variables (FDIGDP, GDPGR, HC, TOT, DIGDP and GOEGDP) the Johansen-Juselius method was applied. It is necessary to determine an appropriate optimal lag length for the task where the Vector Auto-Regression (VAR) lag length selection criteria test was used. Since the Johansen co-integration test was sensitive to the choice of the lag length, lag 3 was chosen because the results of the Akaike Information Criterion (AIC), Swartz Bayesian Criterion (SWC) and Hannan-Quinn Information Criterion (HQ), indicate that lag 3 was the appropriate lag length, in our case at 5% level of significance. After finding the lag lengths, the Johansen co-integration trace statistic was carried out (Verbeek, 2000; Koop, 2005 and Gujarati, 2003). If the Trace statistic for the equation was greater than the critical value ($L_{\max}$), then we would reject the null hypothesis, leading to the conclusion that co-integrated exists at various significance levels (1%, 5% and 10%). Using lag 3, a Johansen-Juselius co-integration analysis was performed for the variables, FDIGDP, GDPGR, HC, TOT, DIGDP and GOEGDP. The trace test suggests that the null hypothesis of no co-integration ($H_0: r=0$) should be rejected in favour of the alternative that there exists at least one co-integration equation ($H_1: r \geq 1$). Four of the trace values have p-values less than 0.05 (at the 5% level of significance), implying that there was strong evidence for the presence of four co-integration regressions. There was, therefore, a long-term relationship among the six variables: FDIGDP, GDPGR, HC, TOT, DIGDP and GOEGDP. The long-term equation (1.5) is presented as:

$$\text{FDIGDP}_t = -0.42 + 0.025 * \text{GDPGR}_t - 1.22 * \text{HC}_t + 1.07 * \text{TOT} + 1.91 * \text{DIGDP} + 6.48 * \text{GOEGDP} \quad (1.5)$$

(0.162) (0.0036) (0.2647) (0.0465) (0.1250) (0.43723)

The numbers in parenthesis below equation (1.5) are standard errors. The co-integration equation (1.5) reveals that all variables are significant. Economic growth, terms of trade, domestic investment and government expenditure indicate a positive long-term relationship with FDI. On the other hand, FDI has a negative long-term relationship with human capital, suggests that Botswana may have a human capital level below the minimum threshold to benefit from FDI as suggested in the study by Borensztein, De Gregorio and Lee (1998).

Vector Error Correction Model (VECM): Having found the existence of a long-run equilibrium relationship between FDIGDP and the explanatory variables; GDPGR, HC, TOT, DIGDP and GOEGDP, there was a need to investigate the short-run dynamics toward long-term equilibrium. According to Engle and Granger (1987), a Vector Auto-regression Analysis (VAR) that incorporates an error correction term is the VECM. By these arguments, a VECM was estimated and the results reported in Table 1 below.

Discussion: Table 1 below indicates that the goodness of fit as measured by the R^2 is 0.75 meaning that the explanatory variables: GDPGR (economic growth rates), HC (human capital), TOT (terms of trade), DIGDP (ratio of domestic investment to GDP) and GOEGDP (ratio of government expenditure to GDP) explain 75% of the variation in FDIGDP (ratio of FDI to GDP), which in turn imply that the FDI model fits the data well. The diagnostic tests results indicate a Durbin-Watson statistic of 2.33, which rules out the problem of serial autocorrelation. The Arch test shows that there is no problem of heteroscedasticity. The results show that the fundamental statistical requirements have been adequately met, inferring that the empirical results of the model are indeed reliable.

Table 1: Results of VECM model (Botswana: 1980-2007)

Variable	Coefficient	Standard error	t-ratio	p-value
dGDPGR 1	0.0117	0.0045	2.6130	0.0241**
dGDPGR 2	0.0080	0.0038	2.0990	0.0597*
dTOT 1	-0.2481	0.0756	-3.2830	0.0073***
dTOT 2	0.0035	0.0890	0.3877	0.7057
dHC 1	-0.2679	1.0265	-0.2611	0.7989
dHC 2	0.1006	1.0289	0.0977	0.9239
dDIGDP 1	-0.5346	0.2114	-2.5290	0.0280**
dDIGDP 2	-0.0096	0.1913	-0.0504	0.9607
1dGOEGDP	0.6314	0.9154	0.6897	0.5047

Dependent variable: difference in the ratio of FDI to GDP (dFDIGDP)

* = variable is significant at 10%. ** = variable significant at 5%; *** = variable is significant at 1%;

$R^2 = 0.75$; Durbin Watson = 2.33

As indicated in Table 1, the coefficient for economic growth rate shows a positive and significant coefficient in the short term at 10% level of significance. Economic growth rates, terms of trade and domestic investment significantly affect FDI in the short-term at 5% level of significance. The coefficient for economic growth rate was positive (as expected) and statistically significant in both the short term (at 5% level of significance) and long term (at 10% level of significance). Therefore, we can state that economic growth rates affected positively on FDI as postulated by the flexible accelerator theory and consistent with the results of the studies by Choe (2003) and Yetkiner (2006). Our results indicate that a 1% increase in economic growth rate would result in an increase in FDI by 1.23% in the short term. They also indicate that economic growth rates are important in both the short-term and long-term in Botswana as it results in increases in FDI. Terms of trade are negatively related to FDI and statistically significant at 1% level of significance in the short term. The results indicate that a 1% increase in terms of trade would lead to a 24.8% decrease in FDI, implying that Botswana trade openness negatively affects FDI flows in the short run. The domestic investment was negative and statistically significant in the short run at 5% level of significance. The results indicate that a 1% increase in domestic investment would lead to a decrease in FDI by 53.4%. This means that domestic investment has negative effects on FDI. The reason for the negative impacts is that the local investment sector in Botswana is still too small to compete or benefit from FDI. The government of Botswana encourages the participation of domestic firms to increase economic growth rates.

The human capital effect is negative and statistically insignificant in the short term. The results were consistent with the findings reported by Kaulihowa (2009) who showed that human capital had a negative impact on FDI flows in Namibia. This, therefore, suggests that Botswana's human capital maybe below the minimum threshold and that the labour force lacks the skilled labor to have a positive impact on FDI. In order to improve the skills of workers, the government of Botswana has invested in education and training, and education has received proportionally more than a third of government budget expenditure. Government expenditure (GOEGDP), a surrogate for infrastructure was positive and statistically insignificant in the short term. The results of government expenditure, even though insignificant, were consistent with the Dunning's Eclectic theory that states that multinational companies will invest where there is good infrastructure. Since independence, the government of Botswana has played a major role in providing efficient infrastructure to create an enabling environment for private sector investment. According to our VECM results, the coefficient of the error correction term for the FDIGDP equation is negative (-0.0551) implying that, if there were a

shock in the system, it would take about 6 months for foreign direct investment to adjust to its equilibrium level.

5. Conclusion

In this study, we aimed to secure an empirical approach for modeling FDI in Botswana, using the flexible accelerator theory of investment. FDI was expressed as a function of GDP growth rates (GDPGR), human capital (HC), terms of trade (TOT), domestic investment (DI), and government expenditure (GOE). The study used 1980 - 2007 time series annual data from Botswana Central Statistics Office (CSO), and United Nations Conference on Trade and Development (UNCTAD) online statistics. The study employed both the co-integration and Vector Error Correction Model (VECM) to find the short-term and long-term effects. We found that there exists a co-integrating relationship between FDI and the explanatory variables: economic growth rates, terms of trade, domestic investment, human capital and government expenditure in Botswana. The results show that GDP growth rates, terms of trade and domestic investment significantly influence FDI inflows in Botswana. Economic growth rates positively impacts on FDI in the short run as expected. The positive impact of economic growth rates is consistent with the flexible accelerator theory of investment. Terms of trade and domestic investment negatively affect FDI in the short term. Human capital and government expenditure do not have an impact on FDI inflows in Botswana in the short term. These results are expected to be useful to policy-makers in that they reviewed the importance of economic growth rates in attracting FDI. In order to achieve a sustained higher economic growth rates the government of Botswana will need to diversify the economy, thereby attracting FDI also in sectors other than mining. This is the contribution generated by the current study. Further studies could investigate whether or not share holding and taxes also influence FDI in developing countries such as Botswana.

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