IS THE MARKET SIZE HYPOTHESIS RELEVANT FOR BOTSWANA? VECTOR ERROR CORRECTION FRAMEWORK

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Abstract

The current study investigated the relevancy of the market size hypothesis of FDI in Botswana in Botswana using the VECM approach with data ranging from 1975 to 2013. The study used FDI net inflows (% of GDP) as a measure of FDI and GDP per capita as a proxy of market size. The findings of the study are threefold: (1) observed that there exists a long run uni-directional causality relationship running from GDP per capita to FDI in Botswana, (2) there is no long run causality running from FDI to GDP per capita in Botswana between 1975 and 2013 and (3) failed to establish any short run causality either from GDP per capita to FDI or from FDI to GDP per capita in Botswana.
Although, GDP per capita of Botswana was a conditional characteristic that attracted FDI, Botswana did not economically benefit from FDI net inflows during the period from 1975 to 2013. The findings defied the theory that mentions that FDI brings into the host country an improvement of human capital development and technology improvement among other advantages which boost economic growth. Possibly, there are other host country characteristics that Botswana needs to address if it hopes to benefit from FDI. The current study recommends further research to find out which are the other conditional characteristics that Botswana authorities need to put in place in ensure that FDI inflows is translated into economic benefits for the country.

Key Words: FDI; Market Size, GDP; VECM; Botswana

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1. Introduction

Quite a number of studies have so far investigated the determinants of FDI in the host countries. For example, investigating the determinants of FDI using annual time series data from 1960 to 2005, Ang (2008) observed that real GDP significantly attracted FDI whilst the growth rate of GDP negligibly positively influenced FDI in Malaysia. Other Malaysian factors that were found to have played a critical role in influencing FDI location decisions include financial development, trade openness and infrastructural development.

Using VECM approach and quarterly time series data from 1998 to 2009, Shaik and Shar (2010) observed a feedback effect between FDI, economic growth and exports in Pakistan. The same study also noted that higher levels of imports played a critical role in boosting FDI inflows and economic growth in Pakistan.

List (2001) employed the two step modified count data model to investigate the California of U.S. firm –level determinants of inward FDI with annual data ranging between 1983 and 1992. The study found that size of the market and land area to a greater extent influenced FDI inflows into the U.S. whilst higher input costs inhibited FDI inflow into the U.S. Yet stringent environmental regulatory framework had a negligible influence on FDI inflow into the U.S. (List, 2001: 969).

Larger size of a region's market and good infrastructure positively influenced FDI inflow in all Chinese regions whilst high labour cost achieved exactly an opposite effect (Cheng & Kwan, 2000: 396). Cheng & Kwan (2000) investigated FDI determinants in 29 Chinese regions during the period between 1985 and 1995 using the dynamic panel regression using regional income as a proxy for the size of a region's market and density of all roads as a measure of infrastructure.

However, literature that specifically focused on examining the relevance of the market size hypothesis of FDI is very scant. In particular, the author is not aware of any study that tested the relevancy of the market size hypothesis in Botswana.

The whole study is structured as follows: Section 2 reviews literature whilst section 3 discusses the trend of the relationship between foreign capital flows and market size (proxied by GDP per capita). Section 4 explains the research methodology, do data analysis and provide the findings of the study. Section 5 summarises the study whilst section 6 shows a reference list.

2. Review of Related Literature

The output and market size hypothesis was originated by Jorgenson (1963). The hypothesis mentions that foreign investment is lured by higher output levels of the multinational enterprise and gross domestic product of a country. In other words, a surge in the output and sales of a particular multinational enterprise already operating in the host country attracts additional foreign investment into that multinational enterprise. Higher levels of GDP of a host country attract foreign investment, according to the market size hypothesis.

A number of empirical studies agreed with the output and market hypothesis. For example, a panel data analysis study by Frenkel et al (2004) that examined the host and home country determinants of FDI inflow into 22 emerging economies found results that reinforced the output and market size hypothesis. Frenkel et al (2004: 297) observed that market size, GDP growth rate and risk profile determined FDI inflow in emerging economies.

Hsiao & Hsiao (2004) investigated the determinants of FDI inflow into China from the U.S, Japan, Hong Kong, Taiwan and Korea using panel data analysis. Their study showed that large market size was instrumental in attracting FDI inflows into China from the US, Japan, Hong Kong, Taiwan and Korea. Moreover, the size of the market attracted more FDI into China from the US and Japan, low labour cost attracted more FDI inflows into China from Hong Kong, Taiwan and Korea (Hsiao & Hsiao, 2004: 666 & 667).

Using cross section and provincial panel data analysis, Zhang (2002) analysed the impact of location characteristics and government policies on FDI inflow into China with data ranging between 1987 and 1998. "Huge market size, high labour quality, good infrastructural facilities, liberalised FDI regime, FDI incentive policies and historical-cultural connections with foreign investors attracted FDI inflow into China thus supporting the market size hypothesis"(Zhang (2002: 56).

Jensen & Rosas (2007) examined the causal relationship between FDI and income inequality in Mexico with ten year annual data ranging between 1990 and 2000 using the instrumental variables methodology which reduces problems of endogeneity and omitted variable bias. They found that a decrease in the income inequality gap was the chief main factor responsible for attracting FDI into all the thirty two states of Mexico as this ensured the majority of the people's purchasing power and demand of products increases (Jensen and Rosas, 2007:484). The same study also observed that FDI inflows into Mexican states contributed to a decline in the inequality gaps (Jensen & Rosas, 2007:481).

Janicki & Wunnava (2004) investigated the bilateral FDI between 15 European Union members (United Kingdom, Greece, Germany, Ireland, Italy, Spain, Portugal, Sweden, Finland, Belgium, Austria, Denmark, France, Luxemburg and Netherlands) and nine central and east European economies (CEEE) awaiting accession into the European Union which included Bulgaria, Czech Republic, Estonia, Hungary, Poland, Slovakia, Slovenia, Romania and Ukraine). Their study used total quantity of imports as a percentage of GDP of the host country as a measure of trade openness and log value of the host country GDP adjusted for the purchasing power parity (PPP) as an indicator of the size of the economy. They found that FDI inflows into the CEEE were influenced by trade openness, size of the economy, labour cost and the level of risk of the host countries, a finding consistent with the market size hypotheses.

Their study also observed that larger market size as proxied by GDP, infrastructural quality as measured by the total roads paved and human capital development as measured by student-teacher ratio were other variables that influenced the FDI location decisions in Turkey regions (Deichmann et al, 2003: 1772-1773).

Tekin (2012) in a study of the relationship between FDI and economic growth found out that GDP positively influenced FDI in Burkina Faso, Gambia, Madagascar and Malawi, a result that supports the market size hypothesis. The same study GDP was Granger caused by FDI in Togo and Benin.

On the contrary, quite a number of studies argued that it is FDI that have a positive impact on economic growth (size of the market). For example, Lucas (1988) stipulated that FDI is accompanied by the transfer of technology, know-how and the training of labour, all of which contributes to the accumulation of human capital and induce technological progress that helps the host country to achieve sustained and long-run economic growth.

"FDI brings along to the host country a bundle of resources that include organizational and managerial skills, market know-how, market access, technology and capital" (Kumar & Pradhan, 2002: 5). This was echoed by Romer (1986) who noted that FDI inflow is accompanied by technology transfer, know-how and improvement of labour skills.

Nath (2005) used the following cross-sectional regression model with time series data ranging from 1989 to 2003 to investigate the relationship between trade, FDI and economic growth in transition economies.

$$g_{i,t} = \mu_i + \beta' X_{it} + \gamma' Z_{it} + \varepsilon_{it} \qquad (1)$$

Where $g_{i,t}$ represents real GDP per capita annual growth rate for country $\boldsymbol{i}$ in year $\boldsymbol{t}$; μ_i stands for the country-specific fixed effect; X_{it} represents a vector of variables of interest such as FDI, trade and domestic investment; Z_{it} is a vector of control variables.

According to Nath (2005:15), when the influence of FDI and trade combined on economic growth was estimated, the study showed that the two variables had a negligible effect on growth in transition economies. Yet, when trade was excluded to form a linear relationship, FDI significantly impacted on economic growth in transition economies through increasing capital accumulation and total factor productivity (Nath, 2005:16).

When the influence of FDI and trade combined on economic growth was estimated, the study showed that the two variables had a negligible effect on growth in transition economies (Nath, 2005:15).

Bogahawatte & Balamurali (2004) examined the influence of FDI on economic growth in Sri Lanka using the unrestricted vector auto-regression (VAR) to test for co-integration and the vector error correction model (VECM) to examine the causality direction between the two variables. The generic specification model that they used is represented in equation.

$$LY_t = \alpha_0 + \alpha_1 LFDI + \alpha_2 LDIN_t + \alpha_3 LOPEN_t + \varepsilon_t \qquad (2)$$

Where Y denotes aggregate real output; DIN stands for the gross fixed domestic investment less net FDI inflows (a proxy for capital stock); L represents the natural logarithms of the variables whilst FDI is a proxy for the quantity of FDI inflow. Ɛ is the error term.. OPEN is a proxy for trade openness defined as total exports and imports as a ratio of GDP.

Their study observed that FDI alongside trade openness exerted a strong positive influence on economic growth and economic growth in turn Granger caused FDI in Sri Lanka (Bogahawatte & Balamurali, 2004:47).

Feridun (2004) examined the impact of FDI on economic growth in Cyprus using the vector error correcting model (VECM) approach. Johansen multivariate co-integration framework was used to estimate the existence of a long run relation whilst Granger causality test was used to determine the causality direction between FDI and economic growth. The study showed not only a unidirectional Granger causality running from FDI to economic growth but that economic growth and development heavily relied on the quantity of FDI inflows into Cyprus (Feridun, 2004:656).

According to Li & Liu (2005) used the following basic model specification to investigate the impact of FDI on economic growth in 21 developed and 63 developing countries with data ranging from 1970 to 1999.

$$g_{i,t} = \beta_0 + \beta_1 \ln y_{i,65} + \beta_2 POP_{i,t} + \beta_3 SCH_{i,65} + \beta_4 INV_{i,t} + \beta_5 FDI_{i,t} + BX_{i,t} + \varepsilon \qquad (3)$$

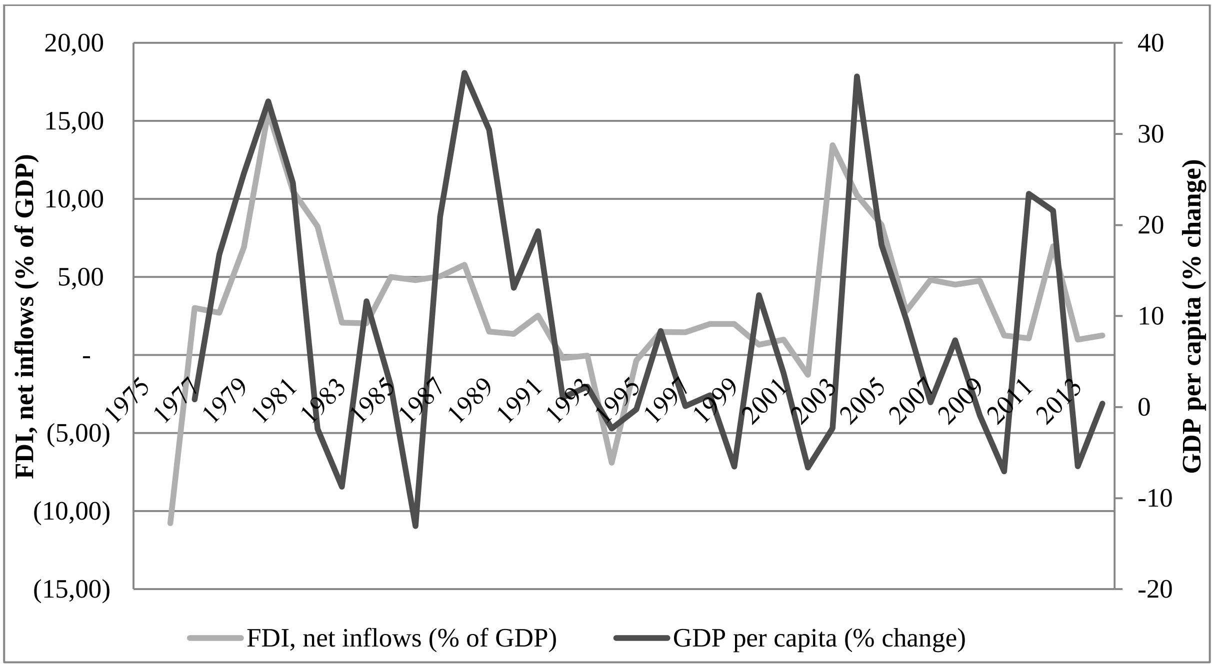
Where $g_{i,t}$ stands for real GDP per capita growth of country i; $y_{i,65}$ represents real GDP per capita in 1965; $POP_{i,t}$ denotes population growth; $SCH_{i,65}$ stands for the level of secondary school education in 1965; $INV_{i,t}$ is the gross domestic investment to GDP ratio; $FDI_{i,t}$ is the FDI inflow to GDP ratio; X represents the country dummies and policy factors that are normally included in the cross-country growth studies.

Their study found out that FDI positively influenced economic growth in a significant manner whilst the interaction of FDI and school attainment level also positively impacted on economic growth in both developing and developed countries. The study observed a strong complementality between FDI and economic growth in both developed and developing countries. The promotion of human capital, technological capabilities and economic growth would lead to more FDI inflows and this in turn promotes further economic growth and competitiveness, argued (Li & Liu, 2005:404).

3. Foreign capital flows and market size trends in Botswana

The current section describes the trends in FDI and market size (represented by GDP per capita) for Botswana between the period 1975 to 2013. FDI, net inflows (% of GDP) went up by 21.29 percentage points, from negative 10.77% in 1975 to 10.51% in 1980 whilst GDP per capita increased by a massive 146% (from US$431.66 in 1975 to US$1 063.51 in 1980 (refer to Figure 1). Furthermore, GDP per capita plummeted by 11.52%, from US$1 063.51 in 1980 to US$941.02 in 1985 whilst FDI, net inflows (% of GDP) declined by 5.71 percentage points during the same time frame to end the year 1985 at 4.81%.

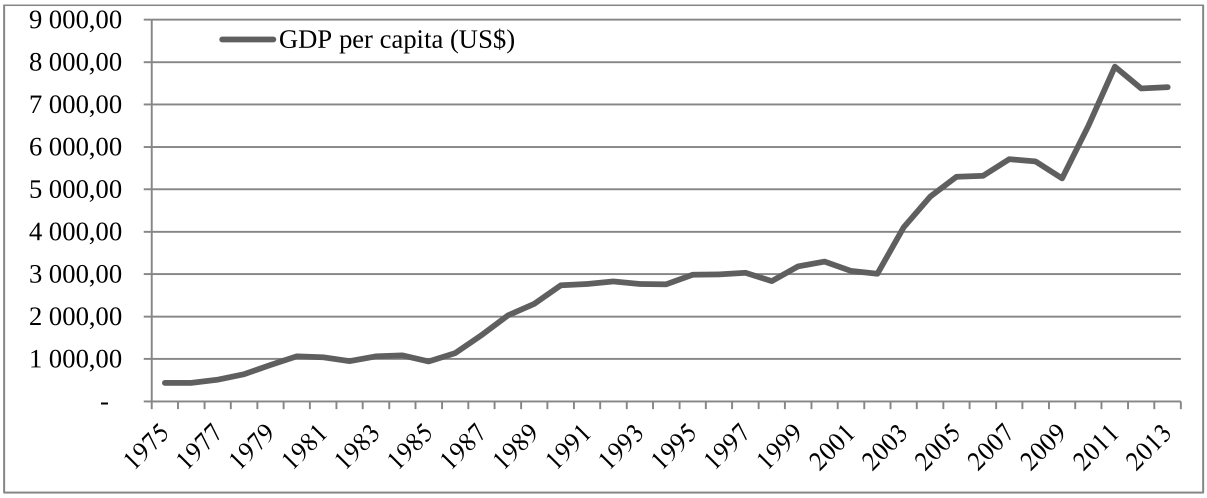
Figure 1. FDI, net inflows (% of GDP) and GDP per capita (% changes) trends for Botswana - 1975 to 2013



Source: World Bank (2014)

The subsequent five year period saw GDP per capita going up by 191.08% to end the year 1995 at US$2 739.07 up from US$941.02 in 1985. On the other hand, FDI, net inflows slightly went down by 2.28 percentage points, from 4.81% in 1985 to 2.53% in 1990 before marginally losing another 1.04 percentage points during the subsequent five year period to end the year 1995 at 1.49%. GDP per capita however gained by 9.07%, from US$2 739.07 in 1990 to US$ 2 987.52 in 1995 before further going up by another 10.38% (from US$2 987.52 in 1995 to US$3 297.48 in 2000 (see Figure 2).

Figure 2. GDP per capita (US$) trends for Botswana from 1975 to 2013

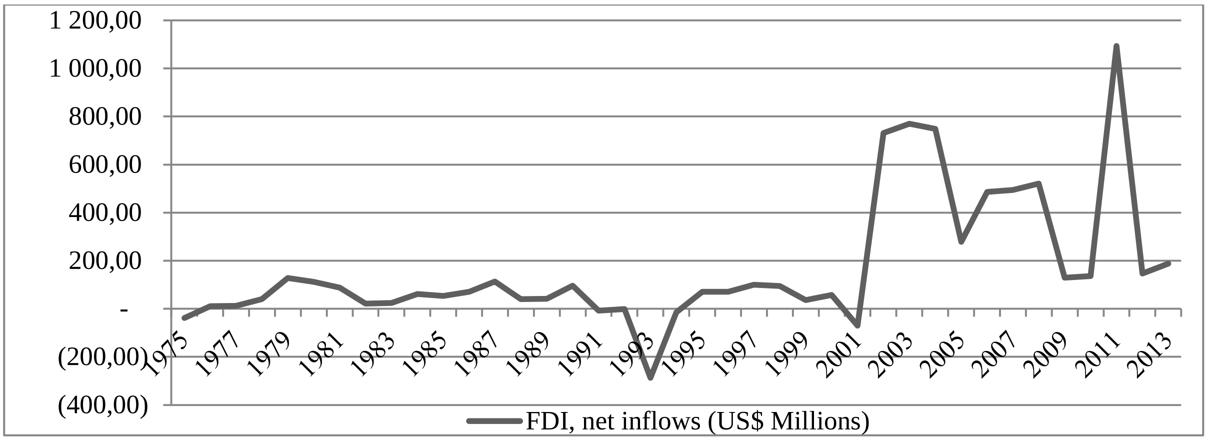


Source: World Bank (2014)

FDI, net inflows (% of GDP) slightly went down by 0.50 percentage points, from 1.49% in 1995 to 0.99% in 2000 before experiencing a rebound of 1.82 percentage points to close off the year 2005 at 2.81%. Furthermore, FDI, net inflow (% of GDP) declined from 2.81% in 2005 to 1.06% in 2010, representing a 1.74 percentage points fall. This was before FDI, net inflows (% of GDP) marginally gained by 0.20 percentage points, from 1.06% in 2010 to 1.26% in 2013.

GDP per capita further increased by 60.56% during the five year period ranging between 2000 to 2005. This represented a surge from US$3 297.48 in 2000 to US$5 294.38 in 2005. The GDP per capita gained by a further 22.64%, from US$5 294.38 in 2005 to US$6 492.87 in 2010. Last but not least, the three year period from 2010 to 2013 saw GDP per capita gaining another 14.15%. It increased from US$6 492.87 in 2010 to US$7 411.30 in 2013.

Figure 3. FDI, net inflows (US$ Millions) trends for Botswana from 1975 to 2013



Source: World Bank (2014)

4. Research Methodology, Data Analysis and Research Findings

This section dealt with data sources and proxies of the variables used, unit root tests, Johansen Test for Co-integration and Granger causality tests under the VECM framework.

Data Sources and Proxies

The study used time series annual data from 1975 to 2013 obtained from the World Development Indicators. The study used FDI net inflow as a ratio of GDP as a measure of FDI whilst GDP per capita was used as a proxy for market size. The auto-correlation which was found in the data at level was dealt away at first difference. The study employed E-Views 8 software package for data analysis purposes.

Unit root tests

FDI and market size data as measured by GDP per capita were non-stationary at level. However, both data variables were found to be stationary at first difference (see Table 1).

Table 1. Stationarity Tests of Variables on first Difference

Variable	Test Statistic – Trend &Intercept	Critical Values	
Stationarity Tests of Variables on first Difference - Augmented Dickey-Fuller - Test			
DFDI	-5.4703	-4.2627*	-3.5530**
DGDPPERCAPITA	-9.0509	-4.2436*	-3.5443**
Stationarity Tests of Variables on first Difference – Phillips-Perron (PP) Test			
DFDI	-27.4595	-4.2350*	-3.5403**
DGDPPERCAPITA	-20.3066	-4.2350*	-3.5403**
Stationarity Tests of Variables on levels – Dickey-Fuller GLS (ERS) Test			
DFDI	-8.6739	-3.7700*	-3.1900**
DGDPPERCAPITA	-9.2613	-3.7700*	-3.1900**

Note:
1) * and ** denote 1% and 5% levels of significance, respectively.
2) * MacKinnon critical values for rejection of hypothesis of a unit root.
3) The truncation lag for the PP tests is based on Newey and West (1987) bandwidth.
4) Critical values for Dickey-Fuller GLS test are based on Elliot-Rothenberg-Stock (1996, Table 1).

In other words, both FDI and market size data (GDP per capita) are integrated of order 1. Before running the Johansen-Juselius maximum likelihood test for co-integration to find the number of co-integrating vectors(s), both the two variables are supposed to integrated of the same order and this requirement was satisfied (refer to Table 1).

Johansen Test for Co-integration Test

The results of the AIC (Akaike Information Criterion) and SIC (Schwarz Information Criterion) tests indicate that the optimal lag of both FDI and GDP per capita is 1 (see Table 2).

Table 2. VAR Lag Order Selection

Criteria						
Endogenous variables: FDI GDPPERCAPITA						
Exogenous variables: C						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-428.1363	NA	81877501	23.89646	23.98443	23.92717
1	-362.6129	120.1261	2685876.*	20.47850*	20.74242*	20.57061*
2	-362.4638	0.256772	3336043.	20.69244	21.13230	20.84596
3	-355.3769	11.41790*	2828379.	20.52094	21.13675	20.73587

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

The Johansen co-integration test under Vector Auto-Regressive (VAR) environment is represented by the following equation.

$$\Delta X_t = \sum_{i=1}^{p=1} r_i \, \Delta X_{t-i} + \text{n}\, \Delta X_{t-1} + \varepsilon_t \qquad (4)$$

Where X_t = 2 x 1 vector (FDI, GDP per capita) respectively. Δ = first difference operator, εt stands for the 2 x 1 vector of residuals. The VECM model contains the long and short run information on the adjustment to changes in X_t through estimated parameters n and r_i respectively.

n ΔX_{t-1} is the error correction term. β stands for the vector of the co-integrating parameters whilst α is the vector of error correction co-efficient measuring the long run relationship.

Johansen co-integration test under Vector Auto-Regressive (VAR) environment uses the maximum eigen-value test and trace test) to examine the number of co-integration vectors (Johansen & Juselius, 1990).

Trace statistic examine the null hypothesis of *r* co-integrating equations against the alternative *n* co-integrating relations, where *n* is the number of variables in the system for r = 0, 1, 2…n-1. The equation for the null hypothesis of the trace statistic is given below.

$$LR_{tr} = -T * \sum_{i=r+1}^{n} \log(1-\lambda) \qquad (5)$$

The maximum Eigen value is represented by the following equation.

$$LR_{\max}(r/n+1) = -T * \log(1-\lambda) \qquad (6)$$

It tests the null hypothesis of *r* co-integrating equations against the alternative of *r-1* co-integrating relations for r = 0, 1, 2…n-1.

Where λ is the Maximum Eigenvalue and T is the sample size.

Table 3 and 4 shows the Trace statistic and Maximum Eigen value results.

Table 3. Unrestricted Co-integration Rank Test (Trace)

Eigenvalue	Trace Statistic	5% Critical Value	Hypothesized No. of CE(s)	Probability**
0.0021	0.0775	3.8415	At most 1	0.7807

**MacKinnon-Haug-Michelis (1999) p-values

The at most 1 null hypothesis says that there is at least one co-integrated equation in the relationship between FDI and GDP per capita. The trace statistic is less than the critical value at 5% significance level and probability is also more than 5%. Therefore the study cannot reject the null hypothesis meaning FDI and market size (GDP per capita) are co-integrated. In other words, the two variables share a common stochastic trend and they grow proportionally in the long run.

Table 4. Unrestricted Co-integration Rank Test (Maximum Eigenvalue)

Eigenvalue	Maximum Eigen Statistic	5% Critical Value	Hypothesized No. of CE(s)	Probability**
0.0021	0.0775	3.8415	At most 1	0.7807

**MacKinnon-Haug-Michelis (1999) p-values

The maximum-Eigen statistic is less than the critical value and probability is more than 5%. Therefore the study cannot reject the null hypothesis which says there is at least one co-integrated equation. This means that FDI and market size (GDP per capita) are co-integrated and they have got a long run relationship.

Granger Causality Tests

Although the Johansen co-integration test shows whether or not there exists a long run relationship between the two variables, it does not tell the direction of causality between FDI and GDP per capita. The VECM approach addresses this. In the current study, a VECM can be represented by the following two equations.

$$\Delta GDPPERCAPITA_t = \sum_{i=1}^{p=1} \beta_i \, \Delta GDPPERCAPITA_{t-i} + \sum_{i=1}^{p=1} \alpha i \, \Delta FDI_{t-i} + Z1{*}EC1_{t-1} + \varepsilon_{1t} \tag{7}$$

$$\Delta FDI_t = \sum_{i=1}^{p=1} M_i \, \Delta GDPPERCAPITA_{t-i} + \sum_{i=1}^{p=1} N_i \, \Delta FDI_{t-i} + Z2{*}EC2_{t-1} + \varepsilon_{2t} \tag{8}$$

Where: β_i, αi, M and N are the short run co-efficients whilst EC1 and EC2 are the long run co-efficients. The residuals in the equations (7) and (8) are represented by ε_{1t} and ε_{2t} respectively. $EC1_{t-1}$ is the lagged value of the residuals derived from the co-integrating regression of GDP per capita on FDI (Equation 7) whilst $EC2_{t-1}$ is the lagged value of the residuals derived from the co-integrating regression of FDI on GDP per capita (Equation 8).

Uni-directional short run causality from FDI to GDP per capita happens in the equation (7) if the set of estimated co-efficients on the lagged FDI (αi) are non-zero. Long run causality relationship running from FDI to GDP per capita happens if the error correction co-efficient (Z1*) of ECT1 is significant.

In the same manner, the short run causality running from GDP per capita to FDI occur in the equation (8) if the set of estimated co-efficients (M) are non-zero. Long run causality running from GDP per capita to FDI happen if the error correction co-efficient (Z2*) of ECT2 is significant.

FDI as a dependent variable whilst GDP per capita is an independent variable

Table 5. Dependent Variable: D(FDI)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.501493	0.169353	-2.961234	0.0056
C(2)	-0.006265	0.141866	-0.044165	0.9650
C(3)	-4.38E-06	0.001700	-0.002577	0.9980
C(4)	-0.045023	0.704603	-0.063899	0.9494
R-squared	0.266222	Mean dependent var		-0.047838
Adjusted R-squared	0.199515	S.D. dependent var		4.243169
S.E. of regression	3.796356	Akaike info criterion		5.607766
Sum squared resid	475.6065	Schwarz criterion		5.781920
Log likelihood	-99.74368	Hannan-Quinn criter.		5.669163
F-statistic	3.990912	Durbin-Watson stat		1.958260
Prob(F-statistic)	0.015713			

C(1) is the error correction term or long run co-efficient or the residual of the one period lag residual of the co-integrating vector between FDI and GDP per capita. C (2) to C (4) stands for the short run co-efficients. The long run co-efficient C (1) is negative whilst the p-value is less than 5%. This means there exist a significant long run causality running from GDP per capita towards FDI.

Does a short run causality running from GDP towards FDI exist?

Using the Wald statistic, the null hypothesis is: there is no short run causality from GDP per capita to FDI. Table 6 shows that p-value of the Chi-square is 99.79% which is greater than 5%. This means that the study cannot reject the null hypothesis. In summary, there is no short run causality running from GDP per capita to FDI.

Table 6. Wald Test

Test Statistic	Value	df	Probability
t-statistic	-0.002577	33	0.9980
F-statistic	6.64E-06	(1, 33)	0.9980
Chi-square	6.64E-06	1	0.9979

Checking the efficiency of the model in which FDI is the dependent variable

Table 7. Checking the efficiency of the model

Normal distribution test	Heteroskedasticity test	Serial correlation test
Jarque-Bera = 26.73907	Observed R-squared	Observed R-squared
P-value = 0.000002	P-value =0.6725	P-value =0.5809

The model does not have serial correlation, using the ARCH test the model does not have heteroskedasticity and the residual of this model is not normally distributed. Generally, the model meets the majority of characteristics of an efficient model.

GDP per capita as a dependent variable whilst FDI is an independent variable

Table 8. Dependent Variable: D (GDPPERCAPITA)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.010817	0.013282	0.814452	0.4212
C(2)	0.075870	0.183991	0.412355	0.6827
C(3)	2.895176	15.35074	0.188602	0.8516
C(4)	173.3703	76.24232	2.273938	0.0296
R-squared	0.046292	Mean dependent var		188.5419
Adjusted R-squared	-0.040408	S.D. dependent var		402.7326
S.E. of regression	410.7889	Akaike info criterion		14.97584
Sum squared resid	5568668.	Schwarz criterion		15.15000
Log likelihood	-273.0531	Hannan-Quinn criter.		15.03724
F-statistic	0.533934	Durbin-Watson stat		1.926755
Prob(F-statistic)	0.662238			

The co-efficient of the long run relationship C(1) is positive, the p-value is greater than 5%. This means the long run causality running from FDI towards GDP per capita does not exist.

Does a short run causality running from FDI towards GDP per capita?

The null hypothesis says that there is no short run causality from FDI towards GDP per capita. The p-value of the Chi-square is more than 5% which suggests that null hypothesis cannot be rejected (see Table 9). The short run causality running from FDI to GDP per capita does not exist.

Table 9. Wald Test

Test Statistic	Value	df	Probability
t-statistic	0.188602	33	0.8516
F-statistic	0.035571	(1, 33)	0.8516
Chi-square	0.035571	1	0.8504

However, the model in which GDP per capita is a dependent variable is not an efficient model because the study found it to have a serial correlation, heteroscedasticity and not normally distributed.

Table 10 provides a summary of the short and long run causality relationships between FDI and market size (GDP per capita) in Botswana.

Table 10. Long and short run causality in the VECM framework for Botswana – FDI and GDP

	GDP per capita→ FDI	FDI→GDP per capita
Long run	Yes	No
Short run	No	No

Conclusion

The current study investigated the relationship between FDI and market size (proxied by GDP per capita) in Botswana using the VECM approach with data ranging from 1975 to 2013. The study observed that there exists a long run uni-directional causality relationship running from GDP per capita to FDI in Botswana. Furthermore, the study noted that there is no long run causality running from FDI to GDP per capita in Botswana between 1975 and 2013. The same study failed to establish any short run causality either from GDP per capita to FDI or from FDI to GDP per capita in Botswana.

Although, GDP per capita of Botswana was a conditional characteristic that attracted FDI, Botswana did not economically benefit from FDI net inflows during the period from 1975 to 2013. In other words, the study supports the output and market size hypothesis of FDI in the case of Botswana. The findings defied the theory that mentions that FDI brings into the host country an improvement of human capital development and technology improvement among other advantages which boost economic growth. Possibly, there are other host country characteristics that Botswana needs to address if it hopes to benefit from FDI. The current study recommends further research to find out which are the other conditional characteristics that Botswana authorities need to put in place in ensure that FDI inflows is translated into economic benefits for the country.

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