Journal of Economics, Trade and Marketing Management
ISSN 2642-2409 (Print) ISSN 2642-2417 (Online)
Vol. 1, No. 1, 2019
www.scholink.org/ojs/index.php/jetmm

Original Paper

The Causality between Foreign Direct Investment and Economic Growth in Botswana: A Multivariate Analysis

Erasmus L Owusu[1*]

[1] Data Science Department, AC Nielsen, Accra, Ghana

Received: April 21, 2019 Accepted: May 1, 2019 Online Published: May 5, 2019

doi:10.22158/jetmm.v1n1p8 URL: http://dx.doi.org/10.22158/jetmm.v1n1p8

Abstract

The paper empirically investigates the short and long-run causal relationship between foreign direct investment, credit to the private sector, trade openness, gross national expenditure and economic growth in Botswana. In doing this, the paper employs multivariate Granger-Causality within an ARDL-bounds approach to co-integration and unrestricted error correction model (UECM). The paper finds that FDI inflow does not spur economic growth but rather, it is economic growth which promotes FDI inflow, credit to the private sector, trade and national expenditure. However, the paper finds a bi-directional relationship between FDI inflow and credit to the private sector both in the short and the long runs. Thus, policies should be targeted at improving the investment climate for existing domestic and foreign investors through infrastructure development and that external capital inflow should be complemented by domestic savings and investors on other to boost economic growth in Botswana.

Keywords

Economic Growth, ARDL-Bounds Testing Approach, Foreign direct investment, credit to the private sector, trade openness, gross national expenditure, Botswana

1. Introduction

In a liberalised and competitive world where every country is striving to grow its economy in order to improve the living standard of the nationals, the question is? What are the main factors which cause economic growth in a given country? The discourse regarding the relationship between foreign direct investment (FDI), credit to the private sector (CPS), trade openness (TO), gross national expenditure (GNE) and economic growth has attracted a vast amount of literature from both theoretical and empirical perspective in recent years more so for the relationship between FDI and economic growth.

According to the International Monetary Fund (IMF), foreign direct investment (FDI) is regarded to be an international investment made by one country's resident or entity, in the business operations of

another business entity resident in a different country, with the intention of establishing a lasting interest. The World Trade Organisation (1996) adds that FDI occurs when an investor based in one country (the home country) acquires an asset in another country (the host country), with the intent to manage that asset for a profit. Furthermore, IMF (2000) is of the view that foreign direct investment can be seen as the ownership of at least 10 per cent of the ordinary shares or voting rights of an enterprise which is usually considered to indicate "significant influence" by an investor. This, however, may differ from one country to the other. And can even be established by their policies, some of which restrict the levels of shareholdings of foreigners in local firms.

Although a number of studies have been conducted on the causal relationship between foreign direct investment and economic growth in sub-Saharan African countries very few of them have considered the comprehensive relationship between foreign direct investments, credit to the private sector, trade openness, gross national expenditure and economic growth in order to establish the actual causes of economic growth. The motivation for this paper is that in Botswana, the diamond industry which is export driven and FDI inflow contributes more than 50% of the country's gross domestic product (GDP) and therefore, economic growth and development focus has on the mining sector. However, the other sectors have not received such FDI inflow. The objective of this paper is to assess the causality and whether this has an impact on other sectors and economic growth. Given that diamonds are a natural resource with a limited lifespan, the Government of Botswana needs to know whether FDI inflow would complement domestic savings and further boost employment and trade opportunities in the other sectors of the economy.

This paper uses the recently developed ARDL-bounds testing approach in a comprehensive multivariate setting to examine the causal relationship between foreign direct investment, credit to the private sector, trade openness, gross national expenditure and economic growth in Botswana from 1975 to 2016. Section 2, we review some of the existing literature on the relationship between foreign direct investment and economic growth. Section 3 describes the methodology used, the empirical analyses, as well as the discussion of the results. Section 4 concludes the paper.

2. Review of Selected Literature

Many theories have been posited to explain the patterns and objectives of FDI, both macroeconomic and microeconomic standpoints. Lipsey (2004), for example, argues from macroeconomic view and sees FDI inflow as external capital across national borders which are measured in balance-of-payments figures. He indicates that at the macro level, the determinants of FDI inflow are the market size, economic growth prospects, level of infrastructure development, availability of natural resources, and institutional factors such as the political stability, amongst others. From a micro level perspective, he contends that the motivations for external investors would be similar to making the investment decision at the firm or industry level. Another facet of explanatory of FDI theory would be that of Dunning (1977) Eclectic Paradigm in which he argues that FDI inflow occurs under different scenarios of

ownership, locational and internalization advantages. Ownership advantages, he explains, are firm-specific and they are exclusive to a specific firm and they come in the form of both tangible and intangible assets like trademarks, patents, information and technology. These he argues, would result in production cost reductions for the firm level, enabling the firm to compete with firms in a foreign country.

Additionally, it must be more profitable for the firm possessing these ownership advantages to use them for internal purposes, rather than to sell or lease them to foreign firms through licensing or management contracts and these are what he called location specifics. According to Popovici and Calin (2014), although FDI inflow location is influenced by firm behaviour in terms of whether it is resource seeking, market seeking, efficiency seeking or strategic asset seeking; the objective remains that the investment decision is taken on the basis of economics and geography, which has a macroeconomic influence as it takes cognisance of country-level characteristics. They explain the success of FDI inflow among countries based on the national wealth of a country, such as the availability of natural resources, availability of skilled and/or cheap labour, local market size, infrastructure and Government policy regarding these national resources (Makoni, 2015).

There has been a myriad of empirical work on the relationship foreign direct investment economic growth mainly based on the neo-classical thinking but with inconclusive outcomes. For example, Chowdhury and Mavrotas (2005) find four main channels through which this relationship has been studied. These channels are the determinants of growth, determinants of FDI, the role of multinational firms in host countries, and finally the direction of causality between the two variables. In the neo-classical world, foreign investment facilitates the transfer of technological know-how to inflow countries and the spill-over effects from these transfers may have substantial benefits for the entire economy (Romer, 1993).

In another study, Olokoyo (2012) employs the Ordinary Least Square (OLS) regression technique to test the relationship between foreign direct investment and economic growth from 1970 to 2007 in Nigeria. The Cochrane-Orcutt iterative method was also used to correct for autocorrelation. The results suggest that there is no support for the view of a robust link between FDI and economic growth in Nigeria. Also, Insah (2013) studies the effects of foreign direct investment on economic growth in Ghana using the Engle-Granger two-step methodology for error correction method. The paper finds inconclusive effect and concludes that policymakers should not concentrate on the current macroeconomic inflow of FDI but rather, consider effects of past FDI inflow on current levels of economic growth.

Furthermore, Melnyk et al. (2014) investigate the impact of foreign direct investment on economic development of post Comecon (Council for Mutual Economic Assistance) transition economies using neo-classical growth model. The results show significant FDI influence on economic growth in the post-communism transition economies. Also, Tshepo (2014) estimates the impact of foreign direct investment on economic growth and employment in South Africa from 1990 to 2013. The study

employs the Johansen co-integration methodology and Granger causality test to establish the causal relationship between the variables. The paper finds strong evidence that from 1990 to 2013, there was a positive long-run relationship between FDI, GDP and employment in South Africa. The paper thus, concludes that FDI should be considered as a mechanism to boost long-term economic growth and employment in South Africa.

Additionally, Chiwira and Kambeu (2016) also examine the relationship between Foreign Direct Investment (FDI) and economic growth in Botswana using yearly time series data from 1980 to 2012, Johansen and Juselius co-integration method and Granger causality test. They find that there is a long-term term relationship between FDI and economic growth in Botswana. However, using the Granger causality tests, they find an inconclusive causality between foreign direct investment and economic growth in Botswana. Finally, Choi and Baek (2017) examine the productivity spill-over effects from inward foreign direct investment by controlling for trade, in the framework of the co-integrated vector auto-regression (CVAR) based on Solow residual approach of the aggregate total factor productivity in India. The results show that the inflow of FDI to India indeed improves total factor productivity growth through positive spill-over effects. However, find that trade appears to have a detrimental effect on total factor productivity growth in India.

This paper differs from the previous ones in two aspects. Firstly, it uses the most recent time series data from 1975 to 2016. Secondly, it looks at a comprehensive multivariate causal relationship between foreign direct investment, credit to the private sector, trade openness, gross national expenditure and economic growth.

3. Methodology and Empirical Analysis

3.1 Methodology

The paper uses a multivariate Granger-causality model within an ARDL-bounds testing framework, in order to investigate the causal relationship between foreign direct investment, credit to the private sector, trade openness, gross national expenditure and economic growth. The ARDL model for co-integration is conducted by taking in turn each variable as a dependent variable. Following Nyasha and Odhiambo (2015), this paper specifies a modified standard multivariate log-linear functional long run relationship between foreign direct investment, credit to the private sector, trade openness, gross national expenditure and economic growth as follows:

$$LnGDP_t = A + \alpha LnCPS_t + \beta FDI_t + \gamma LnTO_t + \lambda LnGNE_t + u_t \quad (1)$$

$$LnCPS_t = A + \alpha LnGDP_t + \beta FDI_t + \gamma LnTO_t + \lambda LnGNE_t + u_t \quad (2)$$

$$FDI_t = A + \alpha LnCPS_t + \beta LnGDP_t + \gamma LnTO_t + \lambda LnGNE_t + u_t \quad (3)$$

$$LnTO_t = A + \alpha LnCPS_t + \beta FDI_t + \gamma LnGDP_t + \lambda LnGNE_t + u_t \quad (4)$$

$$LnGNE_t = A + \alpha LnCPS_t + \beta FDI_t + \gamma LnTO_t + \lambda LnGDP_t + u_t \quad (5)$$

Where GDPt is the real GDP at time t, A is a technological constant, CPSt is the credit to the private sector as % of GDP at time t, FDIt is the foreign direct investment as % of GDP at time t, TOt is the

trade openness as % of GDP at time t, and GNEt is the gross national expenditure as % of GDP at time t. The data used are annual time series taken from the World Bank's World Development Indicators (World Bank, 2018). The econometric software used in this paper is Microfit5.0 (Oxford University Press, Oxford, UK).

Foreign direct investment (FDI) is an effective means of transferring technology to developing countries. This, in turn, fosters economic growth. FDI may affect the level of economic growth as well as the amount of the actual GDP. Sanchez-Robles and Bengoa-Calvo (2002) for example, show the benefit of FDI to economic growth in developing countries. Trade openness (TO), which is computed as total import plus total export and expressed as a ratio of GDP, may affect the efficiency of an economy through several channels, such as specialisation per comparative advantage, access to larger markets with more product variety and increased competition. These effects may, in turn, stimulate both capital accumulation and productivity growth (Bonfiglioli, 2005) and hence, economic growth.

On the other hand, credit to the private sector (CPS) as the ratio of total credit extended to the private sector by the banks to the GDP, measures the level of activities and efficiency of the financial intermediation. An increase in financial resources, especially credits, to the private sector is expected to increase private sector efficiency and production, consequently leading to economic growth. Real government expenditure (GNE) also calculated as a ratio of GDP. This variable was included because it is expected to crowd-out private investment. This has consequences on financial deepening and hence economic growth. Barro and Sala-i-Martin (1995) argue that government expenditure does not directly affect productivity but will lead to distortions in the private sector. One can argue that government expenditure can be growth-enhancing too. This is mostly the case in developing countries where the bulk of investments come in the form of government expenditure. Nurudeen and Usman (2010) for example, show that government expenditures in the transport, communication and health sectors have a positive impact on economic growth (Owusu, 2012).

The testing process will involve three steps. First, we will test for the stationarity of the variables. Second, examine the long run relationship between the variables using ARDL co-integration techniques. This involves the estimation of the long-run coefficients (which represent the optimum order of the variables after selection by the Akaike Information Criteria (AIC) or the Schwarz-Bayesian Criteria (SBC). Finally, the paper uses the Granger causality test methodology together with the ARDL approach for the causality results.

In the context of the ARDL, the paper specifies the following unrestricted error correction model (UECM):

$$\Delta \mathrm{Ln}GDP_t = c_0 + \delta_1 \mathrm{Ln}GDP_{t-1} + \delta_2 \mathrm{Ln}CPS_{t-1} + \delta_3 \mathrm{FDI}_{t-1} + \delta_4 LnTO_{t-1} + \delta_5 \mathrm{LnGN}E_{t-1} + \sum_{i=1}^{p} \alpha_i \Delta \mathrm{LnGDP}_{t-i} + \sum_{i=0}^{q} \beta_j \Delta \mathrm{Ln}CPS_{t-j} + \sum_{i=0}^{q} \gamma_l \Delta \mathrm{FDI}_{t-l} + \sum_{i=0}^{q} \zeta_k \Delta LnTO_{t-k} + \sum_{i=0}^{q} \varphi_v \Delta \mathrm{LnGN}E_{t-v} + \varepsilon_t \quad (6)$$

$$\Delta \text{Ln}CPS_t = c_0 + \delta_1 \text{Ln}CPS_{t-1} + \delta_2 \text{Ln}GDP_{t-1} + \delta_3 \text{FDI}_{t-1} + \delta_4 LnTO_{t-1} + \delta_5 \text{LnGN}E_{t-1} + \sum_{i=1}^{p} \alpha_i \Delta \text{LnCPS}_{t-i} + \sum_{i=0}^{q} \beta_j \Delta \text{Ln}GDP_{t-j} + \sum_{i=0}^{q} \gamma_l \Delta \text{FDI}_{t-l} + \sum_{i=0}^{q} \zeta_k \Delta LnTO_{t-k} + \sum_{i=0}^{q} \varphi_v \Delta \text{LnGN}E_{t-v} + \varepsilon_t \quad (7)$$

$$\Delta \text{FDI}_t = c_0 + \delta_1 \text{FDI}_{t-1} + \delta_2 \text{Ln}CPS_{t-1} + \delta_3 \text{LnGDP}_{t-1} + \delta_4 LnTO_{t-1} + \delta_5 \text{LnGN}E_{t-1} + \sum_{i=1}^{p} \alpha_i \text{FDI}_{t-i} + \sum_{i=0}^{q} \beta_j \Delta \text{Ln}CPS_{t-j} + \sum_{i=0}^{q} \gamma_l \Delta \text{LnGDP}_{t-l} + \sum_{i=0}^{q} \zeta_k \Delta LnTO_{t-k} + \sum_{i=0}^{q} \varphi_v \Delta \text{LnGN}E_{t-v} + \varepsilon_t \quad (8)$$

$$\Delta \text{Ln}TO_t = c_0 + \delta_1 \text{Ln}TO_{t-1} + \delta_2 \text{Ln}CPS_{t-1} + \delta_3 \text{FDI}_{t-1} + \delta_4 LnGDP_{t-1} + \delta_5 \text{Ln}GNE_{t-1} + \sum_{i=1}^{p} \alpha_i \Delta \text{LnTO}_{t-i} + \sum_{i=0}^{q} \beta_j \Delta \text{Ln}CPS_{t-j} + \sum_{i=0}^{q} \gamma_l \Delta \text{FDI}_{t-l} + \sum_{i=0}^{q} \zeta_k \Delta LnGDP_{t-k} + \sum_{i=0}^{q} \varphi_v \Delta \text{Ln}GNE_{t-v} + \varepsilon_t \quad (9)$$

$$\Delta \text{Ln}GNE_t = c_0 + \delta_1 \text{Ln}GNE_{t-1} + \delta_2 \text{Ln}CPS_{t-1} + \delta_3 \text{FDI}_{t-1} + \delta_4 LnTO_{t-1} + \delta_5 \text{Ln}GDP_{t-1} + \sum_{i=1}^{p} \alpha_i \Delta \text{LnGNE}_{t-i} + \sum_{i=0}^{q} \beta_j \Delta \text{Ln}CPS_{t-j} + \sum_{i=0}^{q} \gamma_l \Delta \text{FDI}_{t-l} + \sum_{i=0}^{q} \zeta_k \Delta LnTO_{t-k} + \sum_{i=0}^{q} \varphi_v \Delta \text{Ln}GDP_{t-v} + \varepsilon_t \quad (10)$$

Where in all the equations, δi are the long run multipliers corresponding to long run relationships; c_0, c_1 and c_2 are the drifts; α_i, β_j, γ_l,, ζ_k and φ_v are the short term coefficients; and ε_t is the white noise errors. The multivariate long run causality models corresponding to equation 6 to 10 are therefore express as follows:

$$\Delta \text{Ln}GDP_t = c_0 + \sum_{i=1}^{p} \alpha_i \Delta \text{LnGDP}_{t-i} + \sum_{i=0}^{q} \beta_j \Delta \text{Ln}CPS_{t-j} + \sum_{i=0}^{q} \gamma_l \Delta \text{FDI}_{t-l} + \sum_{i=0}^{q} \zeta_k \Delta LnTO_{t-k} + \sum_{i=0}^{q} \varphi_v \Delta \text{Ln}GNE_{t-v} + \delta_1 \text{ECT}_{t-1} + \varepsilon_t \quad (11)$$

$$\Delta \text{Ln}CPS_t = c_0 + \sum_{i=1}^{p} \alpha_i \Delta \text{LnCPS}_{t-i} + \sum_{i=0}^{q} \beta_j \Delta \text{Ln}GDP_{t-j} + \sum_{i=0}^{q} \gamma_l \Delta \text{FDI}_{t-l} + \sum_{i=0}^{q} \zeta_k \Delta LnTO_{t-k} + \sum_{i=0}^{q} \varphi_v \Delta \text{Ln}GNE_{t-v} + \delta_2 \text{ECT}_{t-1} + \varepsilon_t \quad (12)$$

$$\Delta \text{FDI}_t = c_0 + \sum_{i=1}^{p} \alpha_i \text{FDI}_{t-i} + \sum_{i=0}^{q} \beta_j \Delta \text{Ln}CPS_{t-j} + \sum_{i=0}^{q} \gamma_l \Delta \text{LnGDP}_{t-l} + \sum_{i=0}^{q} \zeta_k \Delta LnTO_{t-k} + \sum_{i=0}^{q} \varphi_v \Delta \text{Ln}GNE_{t-v} + \delta_3 \text{ECT}_{t-1} + \varepsilon_t \quad (13)$$

$$\Delta \text{Ln}TO_t = c_0 + \sum_{i=1}^{p} \alpha_i \Delta \text{LnTE}_{t-i} + \sum_{i=0}^{q} \beta_j \Delta \text{Ln}CPS_{t-j} + \sum_{i=0}^{q} \gamma_l \Delta \text{FDI}_{t-l} + \sum_{i=0}^{q} \zeta_k \Delta LnGDP_{t-k} + \sum_{i=0}^{q} \varphi_v \Delta \text{LnGN}E_{t-v} + \delta_4 \text{ECT}_{t-1} + \varepsilon_t \quad (14)$$

$$\Delta \text{LnGN}E_t = c_0 + \sum_{i=1}^{p} \alpha_i \Delta \text{LnGNE}_{t-i} + \sum_{i=0}^{q} \beta_j \Delta \text{Ln}CPS_{t-j} + \sum_{i=0}^{q} \gamma_l \Delta \text{FDI}_{t-l} + \sum_{i=0}^{q} \zeta_k \Delta LnTO_{t-k} + \sum_{i=0}^{q} \varphi_v \Delta \text{Ln}GDP_{t-v} + \delta_5 \text{ECT}_{t-1} + \varepsilon_t \quad (15)$$

Where in all the equations, δi are the coefficients of the error correction term (ECT); c_0, is the drifts; α_i, β_j, γ_l, ζ_k and φ_v are the short term coefficients; and ε_t is the white noise errors. The short-run causal

impact is measured by using the F-statistics on the explanatory variables in the Granger causality test; while the long-run causal impact is measured by using the error-correction term (ECT) in the ARDL methodology.

3.2 Empirical Analysis

3.2.1 Unit Root Tests for Variables

According to Pesaran et al. (2001), the ARDL-bounds test does not require that all variables be integrated of the same order. It is only required that all variables are integrated of order 0 or 1. It is, therefore, vital to conduct a unit root to ensure that all the variables are integrated of order 1 at most. Tables 1 to 4 below show the results of the Augmented Dickey-Fuller (ADF) and Phillips and Peron (PP) unit root tests for the relevant variables.

Table 1. ADF Unit Root Tests for the Variables in Levels

Variable	No Trend	Result	Trend	Result
LnGDP	-3.678	S	-2.076	N
LnCPS	-1.000	N	-2.989	N
FDI	-3.018	S	-3.078	N
LnTO	-1.803	N	-2.015	N
LnGNE	-2.688	N	-2.753	N

Note. 95% published asymptotic critical value including an intercept but not a trend is -2.936 and the value including an intercept and a trend is -3.525. S = Stationary and N = Non-stationary. Ln is the natural log operator.

Source: Data output via Microfit 5.0.

Table 2. ADF Unit Root Tests for the Variables in the First Difference

Variable	No Trend	Result	Trend	Result
Δ*LnGDP*	-3.007	S	-4.422	S
Δ*LnCPS*	-3.728	S	-3.929	S
Δ*FDI*	-5.128	S	-5.075	S
Δ*LnTO*	-4.135	S	-4.104	S
Δ*LnGNE*	-5.380	S	-5.393	S

Note. 95% published asymptotic critical value including an intercept but not a trend is -2.9348 and the value including an intercept and a trend is -3.528. S = Stationary and N = Non-stationary. Ln is the natural log operator.

Source: Data output via Microfit 5.0.

Table 3. PP unit Root Tests for the Variables in Levels

Variable	No Trend	Result	Trend	Result
LnGDP	-6.509	S	-2.180	N
LnCPS	-0.879	N	-2.361	N
FDI	-5.146	S	-5.126	S
LnTO	-1.593	N	-2.134	N
LnGNE	-2.481	N	-2.445	N

Note. 95% published asymptotic critical value including an intercept but not a trend is -2.932 and the value including an intercept and a trend is -3.522. S = Stationary and N = Non-stationary. Ln is the natural log operator.

Source: Data output via Microfit 5.0.

Table 4. PP unit Root Tests for the Variables in the First Difference

Variable	No Trend	Result	Trend	Result
Δ*LnGDP*	-4.646	S	-5.486	S
Δ*LnCPS*	-4.750	S	-4.949	S
Δ*LnTO*	-6.440	S	-6.514	S
Δ*LnGNE*	-5.957	S	-6.254	S

Note. 95% published asymptotic critical value including an intercept but not a trend is -2.936 and the value including an intercept and a trend is -3.525. S = Stationary and N = Non-stationary. Ln is the natural log operator.

Source: Data output via Microfit 5.0.

As can be seen from Tables 1 o 4, all the variables are either I(0) or I(1)—using the Augmented Dickey-Fuller and the Phillips and Peron (PP) unit root tests. The paper, therefore, rejects the null hypothesis that the variables are non-stationary.

3.2.2 ARDL-bounds Test

The results of the co-integration test, based on the ARDL-bounds testing approach, are reported in Table 5. The results show that, in all the models, the null hypothesis of no co-integration is rejected. This implies that there is a long-run co-integration relationship among all the variables in all the models in Botswana. The results of the causality test are reported in Table 6.

Table 5. Bounds F-test for co-integration

Dependent variable	**Functions**				**F-test statistics**	
LnGDP	F_{LnGDP} (LnGDP| LnCPS, FDI, LnTO, LnGNE)				5.150***	
LnCPS	F_{LnCPS} (LnCPS| LnGDP, FDI, LnTO, LnGNE)				5.346***	
FDI	F_{FDI} (FDI| LnGDP, LnCPS, LnTO, LnGNE)				5.325***	
LnTO	F_{LnTO} (LnTO| LnGDP, FDI, LnCPS, LnGNE)				5.846***	
LnGNE	F_{LnGNE} (LnGNE| LnGDP, FDI, LnCPS, LnTO)				3.749*	
Asymptotic Critical Values						
Pesaran et al (2001),	1%		5%		10%	
p.301, Table CI(iv)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
Case IV	3.81	4.92	3.05	3.97	2.68	3.53

Note. *, ** and *** denote statistical significant at 10%, 5% and 1% levels respectively.

Source: Data output via Microfit 5.0.

Table 5 shows that there is long run co-integration relationship between all the variables. The next step is to test for causality between the variables using the Granger-causality (F-Statistics) methodology.

3.2.3 Causality Test Analysis

The results of the causality test between all the variables and their respective error correction terms are presented in Table 6.

Table 6. Results of Granger-Causality and ECT Tests

Dependent	F-Statistics[probability]					ECT(-1)
Variable	ΔLnGDP	ΔLnCPS	ΔFDI	ΔLnTO	ΔLnGNE	[t-statistics]
ΔLnGDP	-	0.002 [0.965]	0.003 [0.963]	4.750** [0.036]	0.002 [0.965]	-0.004 [-0.255]
ΔLnCPS	3.412* [0.073]	-	5.085** [0.012]	0.021 [0.886]	0.022 [0.885]	-0.297*** [-4.499]
ΔFDI	2.645* [0.067]	4.870*** [0.007]	-	0.012 [0.913]	0.012 [0.913]	-0.717*** [-4.615]
ΔLnTO	17.908*** [0.000]	4.331** [0.011]	3.929* [0.056]	-	0.001 [0.975]	-0.367*** [-4.309]
ΔLnGNE	6.402*** [0.007]	2.278* [0.097]	2.284* [0.085]	2.665* [0.094]	-	-1.241*** [-3.250]

*, ** and *** are 10%, 5% and 1% significance level respectively.

The results in Table 6 reveal that there is a uni-directional relationship between economic growth and trade in both short and long runs from economic growth to trade. On the other hand, there is only a short run causality from trade to economic growth. Thus, in the short run economic growth and trade

openness promote each other but in the long run, trade spurs economic growth. Also, there is a bi-directional relationship between FDI inflow and credit to the private sector both in the short and the long runs. This may suggest that in Botswana, the financial sector is possible, ownership is dominated by real economy companies which are mainly owned by foreign investors.

Additionally, the results show that economic growth spurs national expenditure both in the short and in the long runs. This not surprising as one would expect that the higher the economic growth, the higher government revenue and hence expenditure. The results also indicate that there exists a uni-directional causality from economic growth, credit to the private sector, FDI inflow and trade to government expenditure as well as uni-directional causality from economic growth to credit to the private sector, FDI inflow and national expenditure both in the short and long runs. Finally, the results suggest that there is a unidirectional causal relationship between FDI inflow and trade and that economic growth promotes FDI inflow and not the other direction in both the short and the long runs.

The results may suggest that in Botswana, national expenditure is promoted by a combination of international trade, FDI inflow, credit to the private sector and economic growth. These results are consistent with what was reported by Chiriwa and Kambeu (2016). Note that, the short run causality is supported by the significance of the F-statistics whilst the long run causality is supported by the coefficient of the ECT in the respective functions. As the coefficients are significant and have the expected negative signs.

Furthermore, the regression for the underlying ARDL models fits very well and they pass all the diagnostic tests against serial correlation, functional form, Normality and Heteroscedasticity based on the Lagrange Multiplier (LM) Test Statistics as shown in Table 7. Finally, an inspection of the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) graphs (figures 1 to 10) from the recursive estimation of the model, indicates that there is stability; and there are no systematic changes detected in the coefficient at a 5% significance level over the sample period

Table 7. ARDL-UECM Models Diagnostic Tests

LM Test Statistics Results	LnGDP	LnCPS	FDI	LnTO	LnGNE
R-Square	99.8%	96.0%	65.2%	88.9%	89.8%
Serial Correlation: CHSQ(1)	0.052	0.343	0.115	0.017	4.117
	[0.820]	[0.558]	[0.735]	[0.897]	[0.375]
Functional Form: CHSQ(1)	1.202	3.546	0.575	0.712	0.279
	[0.273]	[0.102]	[0.448]	[0.399]	[0.598]
Normality: CHSQ(2)	1.394	0.312	5.067	0.978	0.501
	[0.933]	[0.855]	[0.102]	[0.613]	[0.788]
Heteroscedasticity: CHSQ(1)	0.032	3.579	0.345	0.456	0.633
	[0.857]	[0.101]	[0.557]	[0.499]	[0.426]

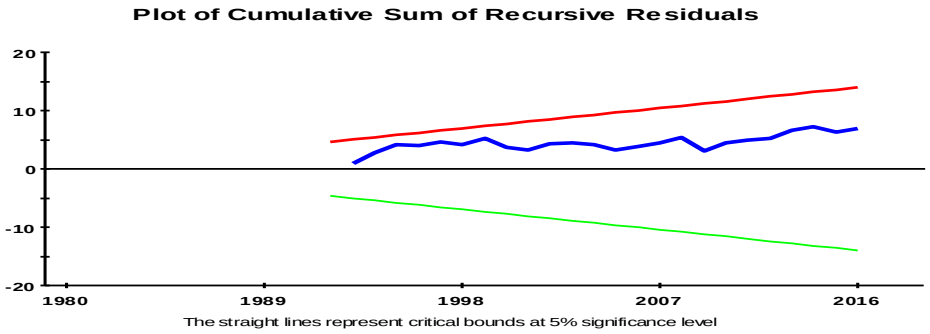

Figure 1. Plot of CUSUM for Coefficients Stability for ECM LnGDP

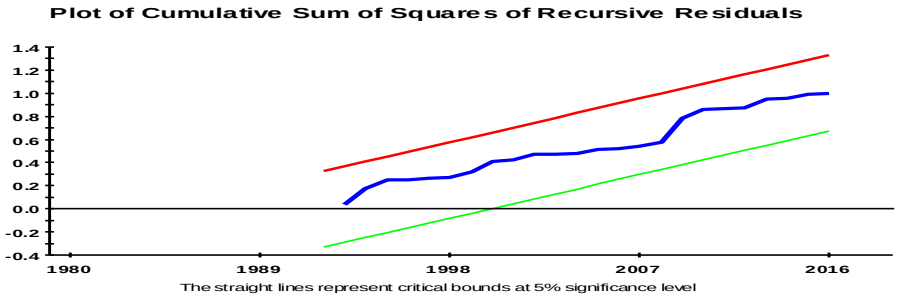

Figure 2. Plot of CUSUMSQ for Coefficients Stability for ECM LnGDP

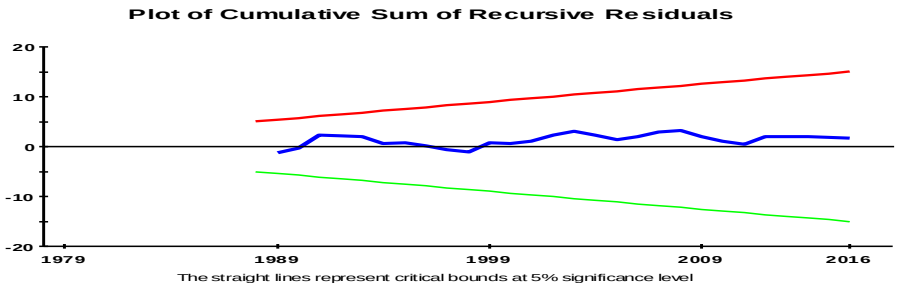

Figure 3. Plot of CUSUM for Coefficients Stability for ECM (LnCPS)

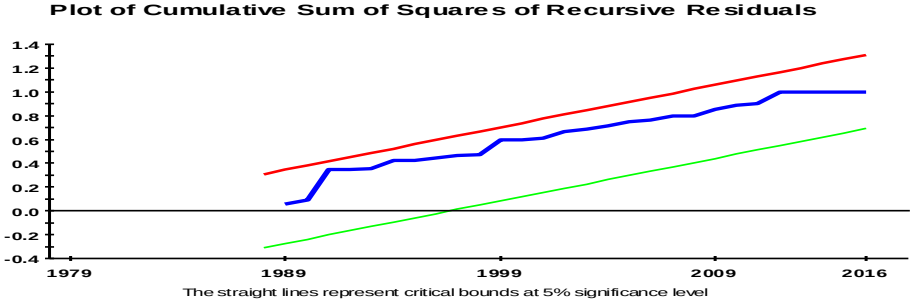

Figure 4. Plot of CUSUMSQ for Coefficients Stability for ECM (LnCPS)

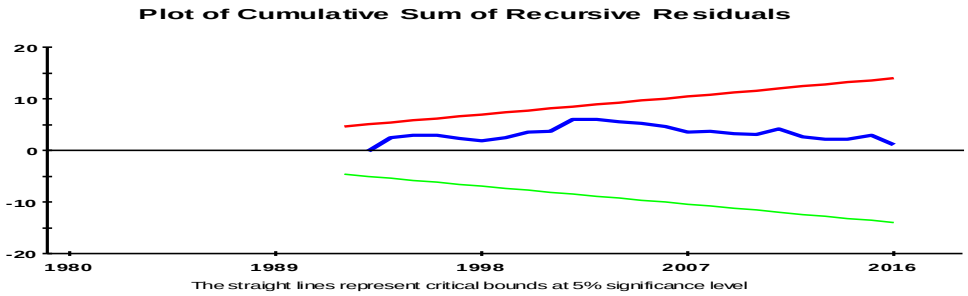

Figure 5. Plot of CUSUM for Coefficients Stability for ECM (FDI)

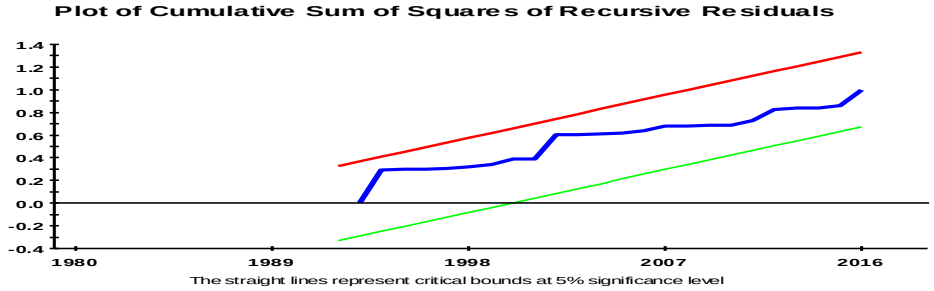

Figure 6. Plot of CUSUMSQ for Coefficients Stability for ECM (FDI)

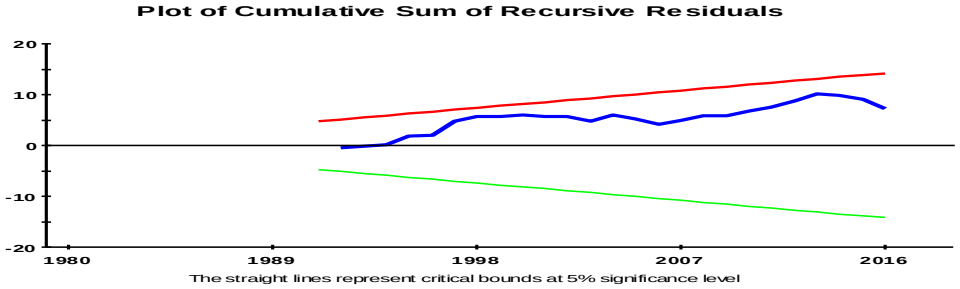

Figure 7. Plot of CUSUM for Coefficients Stability for ECM (LnTO)

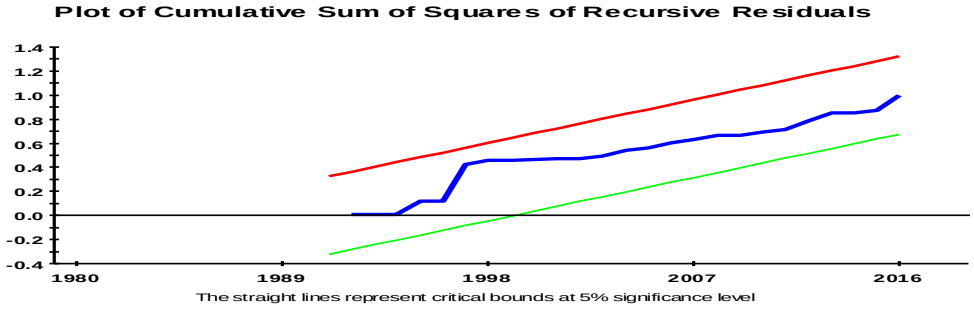

Figure 8. Plot of CUSUMSQ for Coefficients Stability for ECM (LnTO)

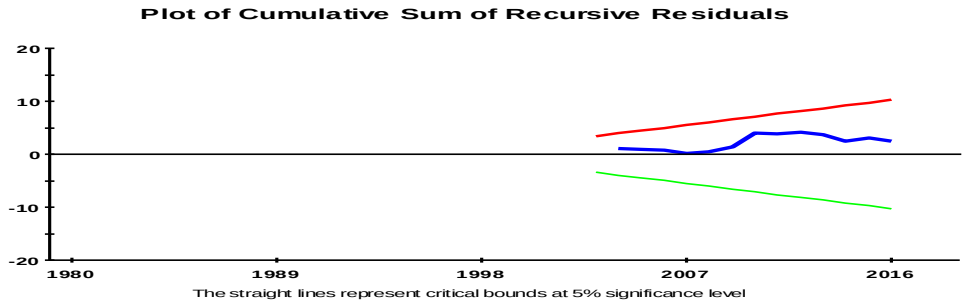

Figure 9. Plot of CUSUM for Coefficients Stability for ECM (LnGNE)

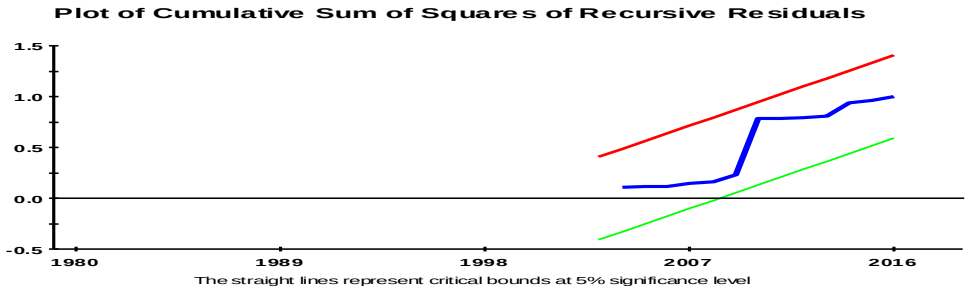

Figure 10. Plot of CUSUMSQ for Coefficients Stability for ECM (LnGNE)

4. Conclusion and Policy Implications

The paper empirically investigates the causal relationship between foreign direct investment, credit to the private sector, trade openness, gross national expenditure and economic growth for the period from 1975 to 2016 in Botswana. The paper employs the ARDL-bounds approach of co-integration and unrestricted error correction model (UECM) using a multivariate Granger-Causality methodology to investigate the causal relationship between the variables. According to Pesaran and Shin (1999), the ARDL methodology has robust properties in small sample size compared with traditional co-integration methodologies which normally require a large sample size. Also, Narayan (2004) shows that the ARDL method removes the uncertainty that comes with pretesting the order of integration of the variables. The paper finds that FDI inflow into Botswana does not spur economic growth but rather, it is economic growth that promotes FDI inflow. In the nutshell, the paper finds that in Botswana, economic growth promotes FDI inflow, credit to the private sector, international trade and national expenditure both in the short and the long runs.

For sustainable economic growth in Botswana, the policy implications arising from the findings in this paper therefore, are that, policies should be geared toward the diversification of the economy and the reform of the ownership structure in favour of domestic investors as FDI inflow does not spur economic growth but rather internal resources which promote real sector growth. Finally, policies should be implemented to improve the investment climate for existing domestic and foreign investors

through infrastructure development and that, external capital inflow should be complemented by domestic savings and investors in other to boost employment and trade opportunities in the country.

References

Barro, R., & Sala-i-Martin, X. (1995). *Economic Growth*. MA: MIT Press.

Bonfiglioli, A. (2005). How does financial liberalization affect economic growth? *Institute for International Economic Studies, Stockholm* (Seminar Paper). Retrieved from http://www.iies.su.se

Chiwira, O., & Kambeu, E. (2016). Foreign Direct Investment and Economic Growth in Botswana: A Dynamic Causality Test. *British Journal of Economics, Management & Trade*, *11*(3), 1-8. https://doi.org/10.9734/BJEMT/2016/21723

Choi, Y. J., & Baek, J. (2017). Does FDI Really Matter to Economic Growth in India? *Economies*, *5*(20), 1-9. https://doi.org/10.3390/economies5020020

Chowdhury, A., & Mavrotas, G. (2005), *FDI and Growth: A Causal Relationship, United Nations University, WIDER*.

Dickey, D., & Fuller, W. (1979). Distribution of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of the American Statistical Association*, *74*(1). https://doi.org/10.2307/2286348

Dunning, J. H. (1977). Trade, location of economic activity and the MNE: A search for an eclectic approach. In B. Ohlin, P. O. Hesselborn, & P. M. Wijkman (Eds.), *The international allocation of economic activity* (pp. 395-418). London: Macmillan.

IMF. (2000). *International Financial Statistics Yearbook*. International Monetary Fund. Retrieved from http://www.imf.org/external/data.htm

Insah, B. (2013). Foreign Direct Investment Inflow and Economic Growth in Ghana. *International Journal of Economic Practices and Theories*, *3*(2), 115-121.

Lipsey, R. E. (2004). Home-and host-country effects of foreign direct investment. *Challenges to Globalization: Analyzing the economics* (pp. 333-382). University of Chicago Press.

Makoni, P. L. (2015). Foreign Direct Investment—The Case of Botswana. *ACTA UNIVERSITATIS DANUBIUS*, *11*(4), 160-173.

Melnyk, L., Kubatko, O., & Pysarenko, S. (2014). The impact of foreign direct investment on economic growth: A case of post-communism transition economies. *Problems and Perspectives in Management*, *12*(1), 17-24.

Narayan, P. K. (2004). *Reformulating Critical Values for the Bounds F-Statistics Approach to Co-integration: An Application to the Tourism Demand Model for Fiji*. Department of Economics. Monash University: Melbourne, Australia.

Nurudeen, A., & Usman, A. (2010). Government Expenditure and Economic Growth In Nigeria, 1970-2008: A Disaggregated Analysis. *Business and Economics Journal*, BEJ-4.

Nyasha, S., & Odhiambo, N. M. (2015). Banks, stock market development and economic growth in South Africa: A multivariate causal linkage. *Applied Economics Letters*, *22*(18), 1480-1485.

Olokoyo, F, O. (2012). Foreign direct investment and economic growth A case of Nigeria. *BVIMSR's Journal of Management Research*, *4*(1).

Owusu, E. L. (2012). *Financial Liberalisation and Sustainable Economic Growth in ECOWAS Countries*. Department of Economics, Doctorate Thesis, University of South Africa (UNISA), Pretoria, South Africa. Retrieved from http://www.worldcat.org/title/financial-liberalisation-and-sustainable-economic-growth-in-ecowas-countries/oclc/830810863&referer=brief_results

Pesaran, M. H., & Shin, Y. (1999). An Autoregressive Distributed Lag Modelling Approach to Cointegration Analysis. In S. Strom, A. Holly, & P. Diamond (Eds.), *Econometrics and Economic Theory in the 20th Century: The Ragnar Frisch Centennial Symposium*. Cambridge, Cambridge University Press. Retrieved from http://www.econ.cam.ac.uk/faculty/pesaran/ADL.pdf

Pesaran, M. H., Shin, Y., & Smith, R. J. (1999). Bounds Testing Approaches to the analysis of level relationships. *Journal of Applied Econometrics*, *16*, 289-326. https://doi.org/10.1002/jae.616

Phillips, P. C. B., & Perron, P. (1988). *Testing for a Unit Root in Time Series Regression* (Vol. 75, pp. 335-346). Biometrica.

Popovici, O. C., & Călin, A. C. (2014). FDI theories: A location-based approach. *Romanian Economic Journal*, *17*(53), 3-24.

Romer, P. (1993). Idea gaps and object gaps in economic development. *Journal of Monetary Economics*, *32*(3), 543-573. https://doi.org/10.1016/0304-3932(93)90029-F

Sanchez-Robles, B., & Bengoa-Calvo, M. (2002). *Foreign direct investment, economic freedom and growth: New evidence from Latin-America* (Economics Working Paper). University of Cantabria.

Tshepo, M. (2014). The Impact of Foreign Direct Investment on Economic Growth and Employment in South Africa: A Time Series Analysis. *Mediterranean Journal of Social Sciences*, *5*(25), 18-27.

World Bank. (2018). *World Development Indicators, various issues to 2018*. Washington DC.

WTO. (1996). *Trade and Foreign Direct Investment, New Report by World Trade Organisation*. Retrieved from http://www.wto.org/English/news_e/pres96_e/pr057_e.htm