

# Effect of Macroeconomic Variables on Economic Growth in Botswana

Strike Mbulawa

Faculty of Accountancy, Botho University, P O Box 501564, Gaborone, Botswana

Corresponding email(s): [smint50000@gmail.com](mailto:smint50000@gmail.com) or [smbulawa2004@myway.com](mailto:smbulawa2004@myway.com)

## Abstract

The study tests the effect of macroeconomic variables on economic growth, establishes the key drivers of economic growth and the casual relationship between economic growth and macroeconomic variables. Annual macroeconomic data was used for the period 1975-2012. The study employed the Vector error correction model and Vector Autoregression techniques. Findings suggest that Foreign Direct Investment (FDI) and inflation had a positive effect on economic growth, the key drivers of economic growth was its previous performance and FDI flows explaining 89% and 8% of variations respectively. The study supports the endogenous growth and the model of technology diffusion. Causality was unidirectional moving from economic growth to FDI and from gross fixed capital formation to GDP growth. Maintaining low inflation with the 3-6% target and high levels of FDI are vital for the growth. FDI can be increased by giving tax concessions to investors and removal of protectionist policies. Training of labour force is vital to widen absorptive capacity of new technology.

**Keywords:** FDI, Economic Growth, Inflation and VECM

## 1. Introduction and Background

The importance of economic growth in Africa cannot be underestimated with most countries experiencing low growth rates. Discussions around this area have taken centre stage in recent years among policy makers while focusing on developing countries and Botswana is no exception. The country has enjoyed uninterrupted civilian rule, progressive social policies, notable capital investment which have positively contributed to its growth since attaining independence in 1966. The growth rate of its Gross Domestic Product (GDP) is one of the fastest in Africa during the period 1966-2013. The economy for Botswana is heavily dependent on diamond mining which sometimes suffers from external shocks. Revenue from diamond trade drives much of the country's growth efforts but more still needs to be done to sustain future growth. The country's GDP grew by an average of 11% per year in 1980 and this fell to around 4.75% in the early 1990s. Botswana is considered a middle income country with a per capita income of around US\$6500 (2012) up from US\$70 (1966). The rate of growth of GDP was around 3%, 3.7%, 10.8%, 6.1% and 4.2% from 2008 to 2012 respectively. The expected growth in 2014 is standing at 5.1%, Matambo (2014) but this had been reduced to 5% by the International Monetary Fund (IMF) projections. This decline was due to the fall in real output of the mining sector and the recessions in 2008/9. The country has now recovered from recessionary shocks and it is expected to grow, African Economic Outlook (2012).

The country enjoys a good climate suitable for attracting foreign investors not with-standing the fact that barriers still exists in terms of regulation. The focus is now on driving economic activity using education, health, transport, innovation and agricultural sector. Attracting foreign investment is spearheaded by the Botswana Export Development and Investment Authority (BEDIA) which supports setting up of businesses focusing on export oriented manufacturing which has not been doing well in the past, UNDP (2007). The aim is to attract technology from outside as a way of promoting citizens. Foreign investors have access to medium and large sized projects provided they join hands with locals. The level of foreign direct investment (FDI) inflows was still low which was around P9446 million coming from mining and finance sectors, Bank of Botswana (2010). According to UNDP (2007) report the country's growth was driven by FDI flows coming from South Africa, Mauritius, India and Zimbabwe covering sectors like insurance, banking, agriculture, mining and clothing. The FDI flows were mainly from South Africa (49%) and diamond sales (60%), African Development Report (2003). Between 1999 and 2003 FDI flows were around 10% of gross fixed capital formation while outward flows were around 3.2%. Between the years 1998 and 2002 fixed investment as a percentage of GDP was 24.3% while growth in per capita GDP was 3.8% which is far less than other African countries, Page and Velde (2003). FDI flows are lower compared to high risky countries like Angola, Mhlanga et al (2009). According to African Economic Outlook (2012) capital formation accounted for 56% of real GDP growth. This shows the country still needs to do more to attract FDI so as to boast growth in GDP.

The country is stable and there are no threats for expropriation or nationalization of foreign owned properties. There is a sound legal system and bankruptcy laws are still intact, corruption levels and ratings are comparable to countries like South Africa (SA) and Mauritius which are known for having effective anticorruption laws. The stock market is fairly large and is composed of both foreign and locally registered companies and it has been enjoying a steady growth. The banking sector is still small with about 9 commercial

banks, a central bank and no merchant banks. The country's exchange rate is pegged against the South African Rand carrying a weighting of 55%. As such it is sensitive to inflationary developments in South Africa and currently the rate of inflation is higher relative to that of South Africa resulting in an appreciation of the domestic real effective exchange rate in 2013, Matambo (2014). Inflationary pressures will continue to haunt the country because of the overreliance on fuel and food imports from South Africa. Prices are fairly stable with inflation rate 4.1% while the bank rate was 7.5% by December 2013 and inflation rate was 4.4% in January 2014, Statistics Botswana (2014). The country is producing a well educated labour force evidenced by a large pool of graduates from the University of Botswana and several private tertiary institutions in recent years which provides a good threshold for effective use of future FDI inflows.

The current economic environment is ripe for promoting and/or attracting growth in GDP. There are effective property rights, low inflation, effective legal systems, low levels of corruption and stable currency. The country enjoys sound macro-economic policies, well functioning institutions, judicious management of diamond and good governance which has contributed to the huge transformation of the economy. There is need to explore more on the other possible drivers of economic growth to allow for effective and credible policy shifts as well as allowing more diversification for the economy, Africa Economic Outlook (2012).

## 2. Problem and Justification of study

Botswana's Mid-term review (2013) shows that economic growth rates for the first three years for NDP 10 were lower than the NDP 9 rate which demand accelerated growth through economic diversification. The rate of growth is still below the coveted rate of 7.5% in order to realize the Vision 2016 objective. The main challenge is that the country's growth efforts are heavily dependent on the mining sector alone. Efforts to diversify the economy have produced little success as diamonds, a non renewable resource, account for all exports, AFDB (2008). More than 50% of diamond revenue accrues to the government, thus policies on government spending are critical, but not sufficient, for growth. Previous growth rates have not translated to significant broadening of the economic base, GDP growth has slowed and FDI flows remain low in absolute terms, Botswana Excellence (2008). While agreeing with Siphambe (2007) that mineral wealth was ploughed back through public expenditures to drive growth, in this research we argue that alternative drivers of growth should be considered to fully diversify the economy. Expanding the economy and increasing human capital is being threatened by the HIV/AIDS pandemic as the infection rate is one of the highest in the world. The budget speech of 2014 shows that the mining sector now account for 20% of GDP being a real decline of about 2.3% and 7% for 2011 and 2012 respectively due to the fall in demand of diamonds by developed nations. The Botswana Meat Commission, another cash cow, was delisted from the European Union in 2012 due to foot and mouth disease outbreak. According to Jefferies (2012) the contribution of mining to growth between 2001 and 2012 was negative while non mining sector made a positive contribution.

The rate of growth had been unstable for the past decade mainly due to tight government policies. Efforts by BEDIA have not produced much expected fruit, AFDB (2007). In the context of Botswana the future growth of the economy is uncertain as the current source of growth is not sustainable; productivity and diversification are still a challenge. But this could be addressed by increasing FDI flows and technical knowhow, UNDP (2007). Thus the country needs to consider other avenues of increasing FDI and capital inflows especially from the private sector investment. There is a potential for harnessing positive growth in the economy but the main issue is on understanding the factors driving growth which cannot be done effectively before establishing their impact. There is need to establish how macroeconomic factors like low inflation, capital formation, FDI flows and trade openness can help drive the country's growth. This is critical for policy makers as they make efforts to diversify the sources of growth and avoid suffering from global shocks. Knowledge about the impact of macroeconomic variables on growth will assist in the crafting of effective legislation to support this endeavor. The degree of openness, for example, is critical as the country is now fostering for an increase in trade revenues by expanding the export sector. The question that still arises is whether or not changes in any of these factors will contribute to growth. The answer to this question in the Botswana context is still unknown. The study empirically determines the applicability of endogenous growth models and model of technology diffusion which link growth to FDI flows. This study aims to contribute to the debate by answering following questions:

- What is the effect of inflation, FDI, capital accumulation and trade openness on economic growth?
- Is there any causal relationship among these variables?
- Is economic growth sensitive to innovations in these macroeconomic variables?
- Does any of these factors drive economic growth and vice versa during the review period?

The coming sections are organized as follows: literature review is covered in section 3, data and methodological issues are covered in section 4, results are discussed in section 5 and lastly section 6 concludes the paper with policy recommendations.

### 3. Review of Literature

#### 3.1: Theoretical Review

The total production of a country increases as the degree of openness improves. This is because the more an economy opens up the more the level of allocative efficiency for that country increases. According to the theory by Richardo a country exports a product in which it enjoys comparative advantage while the theory by Heckscher and Ohlin shows that a country produces and exports a product utilizing the abundant factor intensively. Thus a labour or capital abundant country will export labour or capital intensive goods respectively. The Harrod (1939)-Domar (1946) model, using capital as the only factor of production, shows that trade openness positively affects economic growth. The model by Solow (1956) applies in closed economies and shows that there is a steady state rate of growth which is exogenous and the same with the growth rate of input which grows exogenously at the steady state of labour and technological progress. This theory emphasizes the importance of investment in driving growth, Petrakos et al (2007). According to Srinivasan (1999) the steady state is not affected by any policy shifts like liberalization as the marginal productivity of capital becomes zero due to a rise in capital-labour ratio. But on the other hand positive growths effects, just like in Harrod-Domar model, are experienced in the long term due to policy shifts where the marginal productivity of capital remains less than a positive number. The endogenous and neo classical growths theories outline the importance of human capital and innovation capacity (Petrakos et al, 2007) and they show that trade positively affects growths as it increases productivity, efficiency through comparative advantage. It generates employment opportunities and hence increasing incomes for households which reduces poverty levels, (Chuhday et al, (2010) and Fiestas (2005)).

The rate of economic growth for developing countries can be explained by the rate at which they catch up with level of technology. Using the model of technology diffusion it can be noticed that the rate of growth for a developing country (LDC) is dependent upon the extent at which they adopt and make use of that technology which is being employed by a developed country (DC) taking a leading role. There is need for new technologies and ideas to be transmitted into the country for technology diffusion to happen, Borensztein et al (1998). FDI flows, through the coming of new production techniques, managerial skills and ideas, introduce new technology which increases growth of the economy. The growth rate of LDC is dependent upon the rate at which they take on board technologies from DCs which helps them to catch up with new developments. The endogenous-growth models by Barro (1990) and Lucas (1988) supports the idea that economic growth is enhanced by advancement in technology. These theories are complementary to the model of technology diffusion. According to Romer (2001) inflation is important for economic growth because it can realign the relative prices in response to shifts in production during periods in which technology changes are quick and high levels of inflation have a negative impact on the taxation system as well as on investments. The impact of high inflation on growth is perceived as negative, for example according to Boyd and Champ (2006) the higher the rate then the lower the real rate of return on assets, which discourage saving and encourage borrowing and the quality of borrowers if lower and they are likely to default. This makes financiers to try and find ways of dealing with this problem of default risk by using credit rationing. This failure to distinguish between a risky and non risk borrower gives rise to adverse selection. Nominal rates of interest are increased which negatively affects investment and hence economic growth. Whenever inflation is high investors become less willing to provide funds for investments.

#### 3.2: Empirical Review

The relationship between growth in GDP, a proxy for economic growth, and macroeconomic variables (capital accumulation, FDI, inflation and openness) was reviewed so as to delineate the findings provided in literature and also to reveal the areas that had not been fully addressed in previous researches. The study makes a critical review of the relationship of each of the variables with economic growth.

The relationship between trade openness and growth was inconclusive. Studies were done in different economies using various approaches. The techniques and data types used included but not limited to ordinary least squares, cross country approach, Cobb Douglas production function, panel data, Vector autoregression and Autoregressive distributed lag bound testing model. The relationship between the variables for developing countries was found to be significantly positive (Lopez (2005); Tan (2012); Mwaba (2000); Ali et al (2013); Manni and Afzal (2012); Yeboah et al (2012); Dava (2012); Biwott et al (2013); Asiedu (2013); and Mercan et al (2013)) or negative (Simorangkir (2006); Karras (2006);) while Bajona et al (2010) found no relationship between the trade openness and economic growth. Ulasan (2008) and Yanikkaya (2002) found the relationship to be unpredictable. Causality was found to be bidirectional, Zeren and Ari (2013) and Gries and Redlin (2010). Openness was found by Karras (2006) to have significant negative effect on volatility of output. According to Cavallo (2007) trade openness had a stabilizing effect on output volatility. The results obtained from literature suggest that the work on openness and economic growth is still inconclusive since the relationship is still indeterminate. The expected result, in this research, is that the relationship can be either positive or negative as being revealed in literature.

Botswana enjoys single digit inflation and as such we expect the impact on growth to be significant and positive. Evidence in literature shows that high inflation in the economy give rise to negative effect on growth. As the level of inflation goes up the level of GDP growth lowers and in the long term there is no relationship between the two variables. The rate of GDP growth is sustainable during episodes of low inflation, (Bruno and Easterly (1998); Barro (2013); Kasidi and Mwakademela (2013)). However other studies contradicts these assertions as they suggest that inflation can have negative effects after reaching a certain threshold, negative effects are short term in nature while no impact exists in the long term. High inflationary pressures negatively affect developing as opposed to developed countries, (Pollin and Zhu (2005); Faria and Carneiro (2001) and Jha and Dang (2011)). The relationship between growth rate in growth in GDP and FDI was found to be positive, (Hermes and Lensink (2003); Tiwari and Mutascu (2011) and Campos and Kinoshita (2002)) and some studies found a negative relationship as the inflow of FDI crowds out domestic investment. For example Benito (2007) showed that the relationship was mixed. According to Wang and Yao (2001), Ndambiri et al (2012) and Borensztein et al (1998) an increase in capital accumulation leads to high growth. The positive impact of capital accumulation on growth is consistent with the neoclassical theory, Holtz-Eakin (1993).

Previous work on the relationship between economic growth and macroeconomic variables fails to provide direction and it is therefore inconclusive. This justifies the need to check the nature of the relationship for stable and growing economy like Botswana to assist in the making of credible policies as the country endeavors to realize growth and diversify the economy. The country's efforts to realize Vision 2016 and a growth rate of at least 7.5% per annum can be realized once the relationship among variables becomes predictable.

#### 4. Data and Methodological Issues

This section explains the approach used in answering the questions that were raised at the beginning of the research. The study employed the Vector error correction (VEC) approach to assess the causal relationship in the long run, Impulse response function (IRF) to test the how any one variable would respond to changes in another variable, Forecast error variance decomposition (FEVD) was used to check the key drivers in the changes experienced in a variable, linear regression technique was employed to analyze the effect of macroeconomic variables on growth and granger causality was used to examine the short run casual relationship among variables. This was done after conducting the preliminary tests for time series data. Causality tests were tested using Vector Auto regression techniques to determine direction for causality.

The study employs annual data, extracted online from the World Bank indicators 2014, covering the period from 1975-2012. The model employed is of the following form:

$$GDP_g = f(TO, GFCF, FDI, IF) \dots\dots\dots(1)$$

The specific econometric model was constructed after taking logs on both sides to reduce multicollinearity effect and it appears as follows:

$$LnGDPg_t = \beta_0 + \beta_1 LnTO_t + \beta_2 LnGFCF_t + \beta_3 LnFDI_t + \beta_4 LnIF_t + \epsilon_t \dots\dots\dots(2)$$

Where:

$\beta_0$  is a constant, and  $\beta_1 \dots\dots\dots \beta_4$  are the sensitivity (elasticities) of each macroeconomic variable to economic growth and  $\epsilon_t$  is the error correction term. Annual growth in Gross Domestic Product (GDPg), a dependent variable, was used as a proxy for economic growth. It excludes measures of depreciation of fabricated assets or measures for depletion and degradation of natural resources. It is based on market prices based on constant united states dollars. Independent variables include: Trade openness (TO) which was measured by the sum of Export and Imports divided by GDP, Gross fixed capital formation (GFCF) as a % of GDP was consisting of outlays on additions to the fixed assets of the Botswana's economy plus net changes in the level of inventories, Foreign Direct Investment (FDI) which is a measure of foreign capital net inflows of investment to acquire a lasting management interest in a firm operating in an economy other than that of an investor (equal to equity capital, reinvestment earnings, other long and short term capital) and Inflation (IF) measures the annual % change in the cost to the average consumer of buying a certain basket of goods and services. It is a measure of the effect of price stability on growth. All the independent variables were expressed in % form, World Development indicators (2014).

#### 4.1: Methodology

The study starts by testing for stationarity in the time series data. This is done to avoid using non stationary data



which produces unauthentic results. The stationarity test was done by using the Augmented Dickey Fuller test as provided in literature, Ali (2011). The study then proceeded to test for cointegration among the variables the VEC model. This was done after using the Akaike Information criterion (AIC), Hannan-Quinn Information Criterion (HQIC) and the Schwartz Bayesian Information Criterion (SBIC) to choose the optimal lag length, Adel (2004). The Johansen cointegration technique was used to test the long run relationship among the variables and the number of cointegrating equations was selected using the cointegrating rank. The study used the trace statistic to show the number of cointegrating equations in the model as indicated by an asterisk in brackets, Hosseini et al (2011). The linear regression technique was used to test the effect of macroeconomic variables on economic growth. All the statistics are retrieved from stata 12.

## 5. Empirical Results and Discussion

### 5.1: Descriptive statistics

Table 1: Summary Statistics

Stats	LnGDPg	LnGFCF	LnIF	LnTO	LnFDI
Mean	1.816	3.425	2.284	4.624	0.862
Max	2.968	3.771	2.799	4.826	2.747
Min	-1.384	2.741	1.881	4.369	-3.277
Range	4.352	1.030	0.918	0.457	6.024
Sd	0.845	0.213	0.243	0.136	1.371
Skewness	-1.900	-0.856	0.234	0.053	-1.363
Kurtosis	7.324	4.053	2.279	1.601	5.055
N	38	38	38	38	38

Table 1 shows the behavior of the variables during the review period. The table contains details for the mean, maximum values, minimum values, range, standard deviation, skewness and kurtosis for 38 observations. LnGDPg represents the natural log gross domestic product a proxy for economic growth which is the dependent variable, LnGFCF is the natural log of gross fixed capital formation, LnIF is the rate of inflation, LnTO is the natural log of trade openness and LnFDI is the natural log of Foreign direct investment.

Trade openness had the highest annual average while the annual average for FDI was lowest during the period. The average rate of growth of GDP was 1.816% per annum, average inflation was 2.284% and the average annual flow of FDI was 0.862%. The highest maximum value was for trade openness in 1983 while the lowest was for FDI being for 1979. The minimum values ranged between -3.277% (FDI) to 4.369% (TO). The highest and lowest volatility were experienced by FDI (1.371) and TO (0.136) respectively. This shows that the flow of FDI was the most volatile during the period. The trade for Botswana is mainly dependent on diamonds which appeared to be stable and consistent during the period. The distributions for the rate of GDP growth, GFCF and FDI were normally distributed while all the other variables were non-normally distributed with kurtosis less than 3. GDP growth, GFCF and FDI were skewed to the left (negative values for skewness) while the remaining two variables were skewed to the right (positive values). Our results are consistent with some findings by Samimi et al (2011), Hermes & Lensink (2003) and Ledyeva (2008).

### 5.2: Results from Regression Analysis

Table 2: Results on Unit root tests

Variables	Level	
	Test statistic	Probability
LnGDPg	-4.207	0.0006
LnGFCF	-3.049	0.0305
LnIF	-3.437	0.0098
LnTO	-1.591	0.4881
LnFDI	-4.408	0.0003

Stationary tests were conducted using the Augmented Dickey Fuller test. Significance was tested at 5% level. Variables were defined as in table 1 above.

The results in table 2 showed that the probability based on MacKinnon p-values was less than 5% and so the null hypothesis of unit root was rejected. All the variables, with the exception of Trade openness were stationary at level. We excluded the non stationary variable (TO) in our analysis to avoid producing spurious results.

Table 3 presents the result that the maximum number of lags is one as given by AIC, SBIC and HQIC.

Table 3: Optimal lag length

Lag	LL	LR	Df	p	FPE	AIC	HQIC	SBIC
0	-54.677				0.0060	3.393	3.439	3.527*
1	-39.171	31.012	9	0.000	0.0041*	3.010*	3.194*	3.549
2	-34.662	9.0192	9	0.436	0.0054	3.274	3.596	4.217
3	-30.31	8.70	9	0.466	0.466	0.0074	3.548	4.007
4	-17.77	25.087*	9	0.003	0.0064	3.3394	3.936	5.090

The study made use of the Akaike Information criterion (AIC), Hannan-Quinn Information Criterion (HQIC) and the Schwartz Bayesian Information Criterion (SBIC) to choose the optimal lag length. The decision was based on the result from the HQIC, AIC and FPE.

Table 4: Cointegrating vectors

Maximum Rank	Parms	LL	eigenvalue	Trace Statistics	5% Critical Value	1% Critical Value
0	4	-107.16	0.51129	61.3377	47.21	54.46
1	11	-93.91	0.33551	34.8465*1	29.68	35.65
2	16	-86.35	0.28799	19.7232	15.41	20.04
3	19	-80.06	0.17585	7.1559	3.76	6.65
4	20	-76.49				

The presence of cointegrating relationships was determined using Trace statistics. The results in table 4 confirmed that there was one cointegrating vector at 1% level of significance.

### 5.2.1: The Vector Error Correction Model

Table 5: The VECM model

Beta	Coef	Std Err	Z	p> z
LnGDPg	1			
LnGFCF	0.47	0.778	0.61	0.545
LnIF	1.93	0.69	2.80	0.005*
LnFDI	0.42	0.118	3.57	0.000*
Cons	-4.55			

The variables are as defined in table 1 above. The VECM model was used to check the long run relationship among the variables and to test the effect of macroeconomic variables on economic growth. Significance was tested at 5% level and significant variables are shown by an asterisk (\*).

Table 5 presents results the model fitted using VECM and Johansen normalization. The model fitted well which was reflected by the correct signs for both estimates and adjustment parameters. All the coefficients are above equilibrium (positive signs) and they are taken back to equilibrium with GDP growth rate. There was convergence to equilibrium between gross fixed capital formation, inflation and foreign direct investment at rates of 0.07%, 0.08% and 0.52% respectively per annum. All the adjustment parameters (table 6) are significant which supports the assertion that there was convergence to equilibrium. Both inflation and foreign direct investment have positive and significant signs. This means that if inflation and FDI expand by 1% GDP would grow by 1.93% and 0.42% respectively. The result on FDI is consistent with results by Hermes and Lensink (2003) and Campos and Kinoshita (2002). Gross fixed capital formation positively affected GDP growth but it was insignificant which is inconsistent with results by Shaheen et al (2013) and Chaudhry et al (2010). Our finding on inflation is not surprising given a single digit inflation experienced by Botswana during the review period. This is consistent with findings in literature that inflation negatively affects growth when it goes beyond 10% level or threshold, Jha and Dang (2011) and Ayyoub et al (2011).

Table 6: Adjustment Parameters

Alpha	Coef	Std Err	Z	p> z
LnGDPg	0.554	0.142	3.91	0.000*
LnGFCF	-0.070	0.029	-2.41	0.016*
LnIF	-0.077	0.040	-1.90	0.057**
LnFDI	-0.523	0.263	-1.99	0.047*

The table provides the results for the adjustment parameters after employing the VECM model to test the effect of macroeconomic variables on economic growth. This helps to measure the speed with which variables are converging towards long run equilibrium. Significance was tested at 5% (\*) and at 10% (\*\*).

Our results from IRF tests, figure 1 & 2 in the appendix, showed that the growth rate of GDP responded significantly to its own shocks during the first 5 years beyond which they would become ineffective. Innovations in FDI gave rise to positive responses in GDP growth during the first three years after which it would have no effect even beyond 38 years. The major driver of GDP growth rate was its own performance (89%) in the past and the FDI (8%) during the entire period. Growth rate in GDP explained 10% of variations in

Gross fixed capital formation. The results suggest that there are other important factors explaining growth rate in GDP in Botswana. Considering the Botswana economy one of the factors could be government expenditure which is the greatest employer and consumer in the economy, about 80% of GDP, Botswana statistics (2010).

Table 7: Granger causality Wald tests (1975-2012)

Equations	Variables Excluded	$\chi^2$	Df	Prob> $\chi^2$
LnGDPg	LnFDI	3.4527	1	0.063**
LnGFCF	LnGDPg	5.0083	1	0.025*

The table provides results after performing granger causality tests. Only significant results were presented, insignificant results were ignored. The study used two levels of significance being 5% (\*) and 10% (\*\*).

The study also performed some causality tests on the variables and our results in table 7 suggests that causality ran from growth rate in economic growth to FDI and from gross fixed capital formation to GDP growth and not the other way round (unidirectional causality). This suggests that GDP growth and gross fixed capital formation were important in predicting movements in FDI and GDP growth respectively.

## 6. Conclusion and Policy Implications

This research aimed to establish the effect of macroeconomic variables on economic growth, explain the connection among macroeconomic variables in both short and long run periods and to determine the key drivers of economic growth. The study is critical for policy makers at the moment considering the urgent need to diversify the economy for Botswana. Findings in this study suggested that FDI and inflation had a positive and significant effect on economic growth while gross fixed capital formation had a positive but insignificant effect. Economic growth converged to long run equilibrium with all the three macroeconomic variables. The main drivers of economic growth were its past performance and FDI flows. Causality moved from economic growth to FDI and from gross fixed capital formation to economic growth.

FDI led growth is important for Botswana's economy but for this to happen there is need to focus on increasing the level of GFCF to the minimum threshold which is in line with findings Borensztein et al (1998). The findings in this study are consistent with the endogenous-growth models which support FDI led economic growth as explained in Barro (1990) and Lucas (1988) and the model of technology diffusion as explained by Borensztein et al (1998). FDI is the primary source of technology transfer. The rate of inflation should be kept within the Bank of Botswana's target of 3 - 6% per annum to avoid the negative effect of high inflation rates on growth. Botswana should aim to increase the inflows of FDI into the country by creating favorable policies for investors. More incentives should be given to already existing investors to increase retention rates. The effectiveness of FDI on growth can be enhanced by widening the absorptive capability of available technology, increase more training on the labour force in preparation of working with advanced technologies, giving tax concessions to investors in strategic sectors like mining and agriculture and removing protectionist policies that deter potential investors. The government should come up with policies like tax concessions for companies that diversify and focus on new areas of business to encourage more innovative ideas. It should not be difficult for new businesses to be set up provided they meet all the statutory requirements. Caution should exercised by making sure that FDI will not crowd out domestic investment. The country should also strengthen its financial system for FDI to contribute positively to growth of output. Thus local financial institutions should be able to readily support new and existing businesses to widen their productive capacity and performance. Improving the country's infrastructure may also be attractive to foreign investors.

## 7. References

- Adel A (2004), Dynamic relationship between Macroeconomic factors and the Jordanian stock market, International Journal of Applied Econometrics and Quantitative studies, Vol 1-1(2004), JEL.
- Ali M B (2011), Co integrating Relation between Macroeconomic Variables and Stock Return: Evidence from Dhaka Stock Exchange (DSE), International Journal of Business and commerce, Vol 1, No 2.
- Ali M M, Shaheen S, Kauser A and Bashir F B (2013), Impact of trade liberalization on economic growth in PAKISTAN, Interdisciplinary Journal of Contemporary research in business, Vol 5, No 5.
- African Development Bank (2003), African Development Bank report, 2003.
- African Development bank (2007), African economic outlook, OECD, 2007.
- African Development bank (2008), African economic outlook, OECD, 2008
- African Development bank (2012), African economic outlook, OECD, 2012.
- Asiedu M K (2013), Trade liberalization and growth: The Ghanaian experience, Journal of economics and sustainable development, Vol 4 No 5.
- Ayyoub M, Chaudhry IS and Farooq F (2011), Does inflation affect economic growth? Pakistan Journal of social sciences, Vol 31, No 1, pp 51-64.
- Bajona C, Gibson M L, Kehoe T J and Ruhl K J (2010), Trade liberalization, growth and productivity, University of Nottingham.

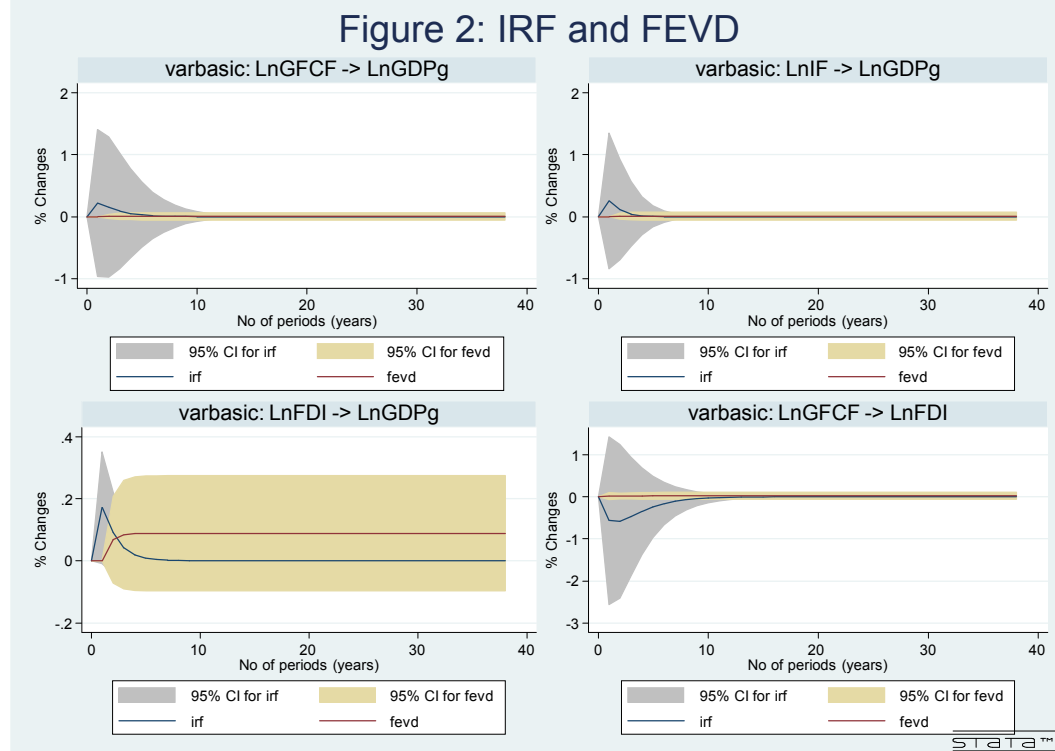
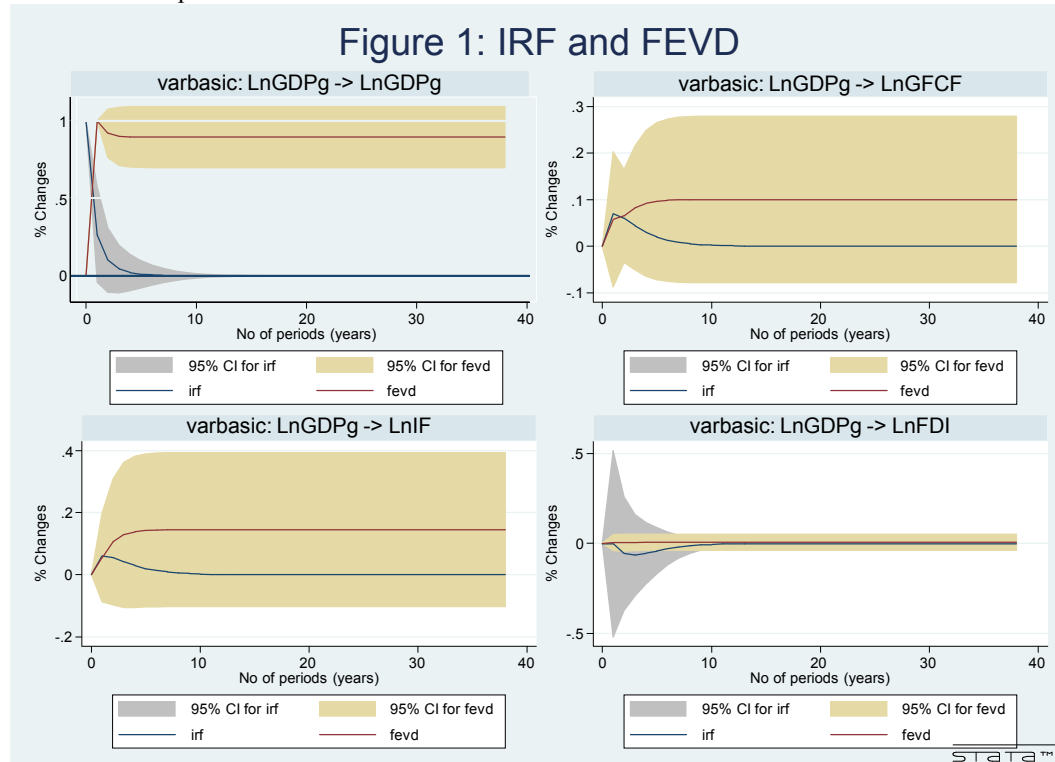
- Bank of Botswana statistics, (2010). Retrieved from: <http://www.bankofBotswana.bw>
- Barro, R. (1990). Government Spending in a Simple Model of Endogenous Growth, *Journal of Political Economy*. 98, 103-125.
- Barro R J (2013), Inflation and economic growth, *Annals of economics and finance* 14-1, 85-109 (2013).
- Benito E M (2007), Determinants of economic growth: A Bayesian panel data approach, CEMFI Working paper No 0719.
- Biwott P K, Moyi E D and Khainga D (2013), Trade liberalization and economic growth: the role of regulatory policies, *Journal of world economic research*, 2(3): 45-57.
- Borensztein E, De Gregorio J and Lee J W (1998), How does foreign direct investment affect economic growth? *Journal of International economics* 45 (1998) 115-135.
- Botswana Excellence (2008), A Strategy for economic diversification and sustainable growth, Government Implementation Coordination Office (GICO), Gaborone.
- Botswana Export Development and Investment Authority (2010), Retrieved from: <http://www.bedia.co.bw>
- Botswana Statistics (2010), National Accounts statistics – Gross domestic product: Fourth quarter and annual 2009, No 2010/8. Retrieved from: <http://www.cso.gov.bw>
- Boyd J H and Champ B (2006), Inflation, banking and economic growth, Federal Reserve bank of Cleveland.
- Bruno M and Easterly W (1998), Inflation crises and long run growth, *Journal of monetary economics* 41(1998) 3-26, Elsevier.
- Campos N F and Kinoshita Y (2002), Foreign direct investment as technology transferred: Some panel evidence from the transition economies, William Davidson Institute Working paper 438.
- Cavallo E A (2007), Output volatility and openness to trade: A reassessment, Inter-American development bank, Research department.
- Chaudhry; Ali Malik & Muhammad Zahir Faridi. "Exploring the causality relationship between trade liberalization, human capital and economic growth." *Journal of Economics and International Finance*, 2010: Vol. 2(8), pp. 175-182.
- Dava E (2012), Trade liberalization and economic growth in the SADC: A difference in difference analysis, IESE conference paper no 8.
- Domar, E. (1946). Capital expansion, rate of growth and employment. *Econometrica* 14: 137–147.
- Faria J R and Carneiro F G (2001), Does high inflation affect growth in the longrun and short run, *Journal of applied economics*, Vol IV, No 1 (May 2001), 89-105.
- Fiestas I (2005), "The effects of trade liberalization on growth, poverty and inequality." CILAE Foundation.
- Gries T and Redlin M (2010), Trade openness and economic growth: A panel causality analysis, University of Paderborn, Germany.
- Harrod, R. F. (1939). An essay in dynamic theory. *Economic Journal* 49: 14–33.
- Hermes N and Lensink R (2003), Foreign direct investment, Financial development and economic growth, *Journal of development studies*, Vol 38, 2003.
- Holtz-Eakin D (1993), Solow and states: capital accumulation, productivity and economic growth, *National Tax Journal*, Vol 46, No 4, pp 425-39.
- Hosseini S M, Ahmad Z & Lai Y W (2011), The Role of Macroeconomic Variables on Stock Market Index in China and India, *International Journal of Economics and Finance*, Vol 3, No 6.
- Jefferies K (2012), BIFM Economic review, 3<sup>rd</sup> quarter 2012, Broadhurst, Botswana.
- Jha R and Dang T (2011), Inflation variability and the relationship between inflation and growth, ASARC working paper 2011/08.
- Karras G (2006), Trade openness, economic size, and macroeconomic volatility: Theory and empirical evidence, *Journal of economic intergration* 21(2); 254-272.
- Kasidi F and Mwanemela K (2013), Impact of inflation on economic growth: A case study of Tanzania, *Asian Journal of empirical research*, 3(4) 2013: 363-380.
- Lucas, R. (1988). On the Mechanics of Economic Development, *Journal of Monetary Economics*. 22:3-42.
- Lopez R A (2005), Trade and growth: Reconciling the macroeconomic and microeconomic evidence, Department of economics, Indiana University.
- Ledyeva S (2008), Determinants of Economic growth: Empirical evidence from Russian Regions, *The European Journal of Comparative Economics*, Vol 5, No 1, pp 87-105.
- Manni U H and Afzal M N I (2012), Effect of trade liberalization on economic growth of developing countries: A case of Bangladesh economy, *Journal of business, economics and finance* ISSN: 2146-7943.
- Matambo O K (2014), Budget speech, Ministry of Finance and development planning, Republic of Botswana. Retrieved from: <http://www.finance.gov.bw>
- Mercan M, Gocer I, Bulut S and Dam M (2013), The effect of openness on Economic growth for BRIC-T countries: Panel data analysis, *Eurasian Journal of business and economics* 6(11), 1-14.
- Mid Term Review (2013), NDP 10 Towards 2016, Ministry of Finance and Development Planning, Botswana.



- Mhlanga N, Blalock G and Christy R (2009), Understanding Foreign Investment in the Southern African Development Community: An analysis based on Project level data, International Association of Agricultural Economists conference, Beijing, China.
- Mwaba A (2000), Trade liberalization and growth: Policy options for African countries in a global economy, AFDB, Economic research papers No 60.
- Ndambiri H K, Ritho C, Ng'ang'a S I, Kubowon PC, Mairura F C, Nyangweso P M, Muiruri E M and Cherotwo F H (2012), Determinants of economic growth in Sub Saharan Africa: A Panel data approach, International Journal of economics and management, Vol 2, No 2, 2012, pp 18-24.
- Page S and Velde D W (2003), Foreign direct investment by African Countries, Overseas Development Institute, London.
- Romer D (2001), Advanced Macroeconomics, 2<sup>nd</sup> edition, New York: McGraw Hill.
- Simorangkir I (2006), The openness and impact to Indonesian economy: A SVAR approach, Centre for central banking education and studies, Bank Indonesia.
- Tan C J K (2012), International Trade and economic growth: Evidence from Singapore, University of Columbia.
- Tiwari A K and Mutascu M (2011), Economic growth and FDI in Asia: A panel data approach, Economic analysis and policy, Vol 41, No 2.
- UNDP (2007), Asian Foreign Direct Investment in Africa: Towards a new era of co-operation among developing countries, United Nations conference on Trade and Development, UNDP.
- Petrakos G, Arvanitidis P and Pavleas S (2007), Determinants of economic growth: The experts' view, Dynamic Regions in a knowledge driven global economy: Lessons and Policy implications for the EU, Working papers.
- Pollin R and Zhu A (2005), Inflation and Economic growth: A cross country Non linear analysis, Political economy research institute, working paper series number 109.
- Samimi A J, Ghaderi S and Sanginabadi B (2011), Openness and inflation in Iran, International Journal of economics and management engineering (IJEME), World Academic publishing. Retrieved from: <http://www.ijeme.org>
- Siphambe H K (2007), Growth and Employment Dynamics in Botswana: A Case Study of Policy coherence, Policy Integration and Statistics Department International Labour Office, Geneva, Working paper No 82.
- Solow, R. (1956), A contribution to the theory of economic growth. Quarterly Journal of Economics 70: 65-94.
- Srinivasan, T. N. (1999). Trade orientation, trade liberalization, and economic growth. In G. R. Saxonhouse and T. N. Srinivasan (eds), Development, Duality, and the International Economic Regime. Essays in Honor of Gustav Ranis. Ann Arbor, MI: The University of Michigan Press.
- Statistics Botswana (2014), Consumer Price Index Report, 2014.
- Ulasan B (2008), Trade openness and economic growth: A cross country empirical investigation, Thesis submitted to the University of Nottingham.
- Wang Y and Yao Y (2001), Sources of China's economic growth, 1952-99: Incorporating Human capital accumulation, World bank.
- World Bank development indicators (2014): Retrieved from <http://data.worldbank.org/indicator/SP.POP.TOTL>
- Yanikkaya H (2002), Trade openness and economic growth: A cross country empirical investigation, Journal of development economics 72 (2003) 57-89.
- Yeboah O, Naanwaab C, Saleem S and Akuffo A (2012), Effects of trade openness on economic growth: The case of African countries, Agribusiness, applied economics and Agriscience Education-NC A & T.
- Zeren F and Ari A (2013), Trade openness and economic growth: A panel causality test, International journal of business and social science, Vol 4 No 9.

**Appendix**

Both figure 1 and figure 2 provides results after performing Impulse response functions and Forecast error variance decomposition tests in stata 12.



The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:

<http://www.iiste.org>

## CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

**Prospective authors of journals can find the submission instruction on the following page:** <http://www.iiste.org/journals/> All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

## MORE RESOURCES

Book publication information: <http://www.iiste.org/book/>

Academic conference: <http://www.iiste.org/conference/upcoming-conferences-call-for-paper/>

## IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digital Library, NewJour, Google Scholar

