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## Macroeconomic Determinants of Balance of Payments in Botswana

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**Abstract:** This paper assesses the macroeconomic determinants of balance of payments in Botswana from 2006 to 2016. For empirical analysis, the study employs the Unrestricted Vector Auto Regression (VAR) model which is interpreted through the use Impulse Response Function (IRF). Results revealed that, in Botswana, variations in balance of payments are not exclusively a monetary phenomenon since not only monetary variables (inflation and interest rate) are significant. GDP which included mining revenues was found to be the most significant variable in explaining movements in balance of payments; this concurs with the fact that mining plays a paramount role in Botswana's macroeconomic stability. Thus, in correcting balance of payments disequilibrium, there is need to employ complementary monetary and fiscal policies.

**Keywords:** current account, capital account, vector Autoregressive model, impulse response function.

### 1. INTRODUCTION

Balance of payments (BOP) is described as a statement of double entry format that records transactions between residents and non-residents of a country for a given period usually a year. More precisely balance of payments is the deviation between total payments and total receipts to and from (respectively) foreign nations over a given period arising from imports and exports of goods and services, current and capital transfers from abroad and financial flows (International Monetary Fund (IMF), 2009).

Eita & Gomab (2012), identified the main determinants of balance of payments as fiscal balance, interest rates and gross domestic product (GDP) growth in Namibia. Similarly, Osoro (2013), found that exchange rates indirectly affect the balance of payments. Further, Eita & Gomab (2012) found out that Southern African Customs Union (SACU) remittances play a remarkable role on Namibia's balance of payments accounts. The implication of this is that a decline in SACU receipts in future will cause a balance of payments crisis. Hence, the need for policymakers to comprehend SACU remittances forecasts to predict

the possibility of a macroeconomic or balance of payments instability. Results from the study depicted that GDP and interest rates have a positive impact on balance of payments resulting in an improvement in the current and capital account respectively and ultimately affects the overall balance of payments positively.

Botswana being in the southern part of Africa faces a similar problem as Namibia. SACU receipts are expected to fall due merchandise trade deterioration hence a decline in current account surplus, Bank of Botswana (2015). The main objective of this paper is to identify the macroeconomic determinants of the balance of payments in Botswana. To achieve this, the paper investigates (i) macroeconomic variables that policymakers need to consider to attain balance of payments stability (ii) examine the effects of non-mining GDP on Botswana's Balance of Payments (BOP). This paper adopts the use of the Unrestricted Vector Auto Regression model (unrestricted VAR) based on the results of the cointegration test. The model is preferable since it accounts for non-stationary data. Further, Vector Auto regression (VAR) corrects for auto correlation and endogeneity of variables (Gujarati & Porter, 2009). Our paper is different from other studies on BOP in Botswana in the sense that it explores the macroeconomic determinants of the BOP and also uses a model that excludes mining GDP. Conversely, previous studies have been based on the trade balance BOP surpluses in Botswana.

## **2. BALANCE OF PAYMENTS (BOP) IN BOTSWANA**

As adopted by the Statistics and Information Services Unit at Bank of Botswana, transactions entering the balance of payments statistics in Botswana fall into three main categories namely;

- (a) Current Account:** comprises of merchandised trade (trade in goods such as diamonds and beef), trade in services (such as insurance and banking), income account and current transfers (funds that residents receive for free). This account basically consists of imports and exports.
- (b) Capital Account:** is mainly includes capital grants to government and the transfer of migrants' assets.
- (c) Financial Account:** comprises of direct investment (when an investor holds more than 10% of equity capital), portfolio investment (a case whereby an investor holds less than 10% of equity capital) and other investment. Equity capital is the purchase of a business's shares that gives the buyer the right to ownership of the company.

Botswana consistently maintained a BOP surplus from 1996 to 2008 mainly due to revenues from diamond exports. However, the country's BOP was negatively affected by the global financial crisis of 2008. BOP remained at a surplus in 2008 because the country began experiencing a recession from the last quarter of 2008. Even if the overall balance in 2005 was a surplus, it reflected a decline from 10.7 billion in 2007 to 7.5 billion (Ncube, 2013).

The negative impact from the financial crisis led the country to a BOP deficit in 2009 and 2010. As a result, business operations slowed down, some firms were temporarily shut down (e.g shut down of the Damtshaa diamond mine and cutting back of production from the other diamond mines from 2009 to end of 2010). Investment in mining was also put to hold (Ncube, 2013). Reduction in production together with a decline in investment resulted in a decline in exports while imports increased drastically. The decline in the global demand for minerals and weak diamond prices led to a current account deterioration in 2009

and 2010. In 2012, merchandise trade deficit led to BOP deficit because total exports were estimated to have risen by 4.1% while imports increased by 21.3%. The current account deficit after 2012 was offset by SACU receipts (Bank of Botswana, 2012 & 2015). Before the financial crisis, diamonds made up 70% of Botswana's exports, nevertheless, the recession worsened trade balance due to diminishing demand for exports and a steady increase in imports. After the Global Financial Crisis (GFC), the contribution of diamonds to export earnings decreased by 32% (Ncube, 2013).

The capital account was revised to capture transactions of assets by migrants which are significant only after grants received by the Government were reclassified to current transfers. This explains the negative figures from 2002 to 2007 as shown in table 1 below.

The large surplus of the financial account in 2011 was due to the loan drawn by the Government from the African Development Bank (Bank of Botswana, 2012). Net errors and omissions reflect statistical discrepancies and take account of any omitted data due to the inefficiency of the methods of data collection.

**Table 1**  
**Summary of Balance of Payments From 1996 to 2015 (in BWP Millions)**

<i>Year</i>	<i>Trade Balance</i>	<i>Balance on current a/c</i>	<i>Balance on capital a/c</i>	<i>Balance on financial a/c</i>	<i>Net errors and Omissions</i>	<i>Overall Balance</i>
1996	2 493	1 644	21	141	(83)	1 722
1997	3 269	2 634	62	20	(398)	2 318
1998	328	860	135	(855)	118	256
1999	3 629	2 859	95	(1128)	2	1 829
2000	4 603	2 782	194	(1030)	(6)	1 941
2001	4 149	3 492	34	(3 815)	474	1 023
2002	4 280	1 318	(37)	(1 329)	384	336
2003	3 782	3 350	(42)	(1 889)	(622)	797
2004	3 063	1 659	(39)	(1 107)	4	518
2005	8 123	8 165	(44)	(4 136)	3 051	7 036
2006	10 159	11 363	(48)	(688)	(371)	10 256
2007	7 094	10 140	(51)	(214)	818	10 694
2008	(2 574)	1 006	-	4 960	1 487	7 452
2009	(9 377)	(4 680)	-	1 966	(1 848)	(4 563)
2010	(6 798)	(2 420)	23	(2 464)	(1 649)	(6 511)
2011	(4 799)	3 250	3	7 008	(6 831)	3 430
2012	(16 715)	(1 274)	-	1 523	(1 112)	(862)
2013	(2 353)	11 624	1	(8 101)	(2 184)	1 340
2014	4 673	22 240	-	2 658	(13 494)	11 404
2015	(9 066)	11 314	2	(8 590)	(8 590)	(57)

*Source:* Botswana Financial Statistics 2006-2016; Bank of Botswana Annual Reports 2000-15

The consistent maintenance of the current account surplus (except during the recession), led to the accumulation of substantial foreign exchange reserves. Foreign exchange reserves fell between 2001 and

2002 mainly due to payments of public officers' pension fund (Mmualefe, 2015). In 2005, foreign exchange reserves grew by 42% due to favourable diamond prices and an increase in the value of the Pula. Contraction of exports led to a decline in reserves in 2009. On the other hand, depreciation of the Pula against the Special Drawing Rights (SDR) and the US Dollar led to an increase in foreign exchange reserves and inflows from SACU increased Botswana's reserves (Mmualefe, 2015).

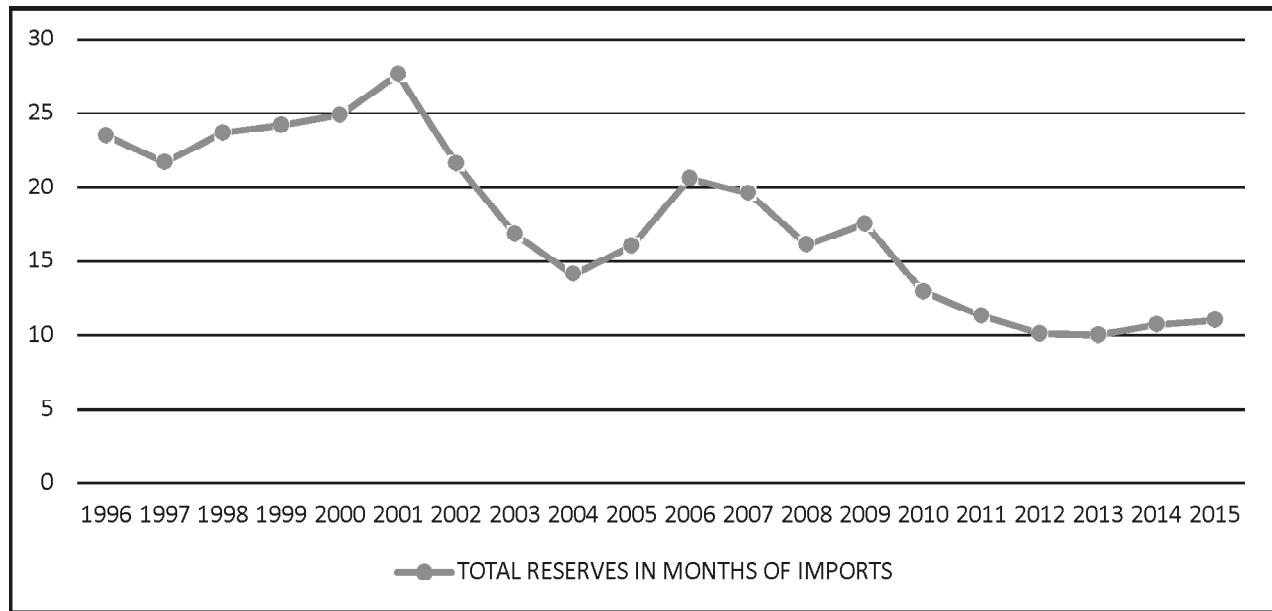


Figure 1: Foreign Exchange Reserves in Months of Imports Cover

Source: World Bank (2016)

The balance of payment deficit in Botswana is caused by a decline in the global demand of rough diamonds hence a downwards pressure on diamonds prices (Bank of Botswana, 2015). This ultimately leads to trade balance deterioration. On the contrary, substantial foreign exchange reserves helps maintain the current account surplus. However, current account surplus in Botswana is expected to decline in the short run because of the merchandise trade deficit (Bank of Botswana, 2015). This trade deficit is as a result of a reduction in mineral exports even if this is often offset by an increase in SACU remittances or revenues. The SACU remittances are expected to shrink and the global demand and prices of rough diamonds are also expected to continue diminishing and this poses a threat to the BOP stability (Bank of Botswana, 2015). The negative effect of a deteriorating trade balance and merchandise trade deficit is that over time they lead to job outsourcing. This is a situation whereby the domestic economy cannot create jobs or creates fewer jobs due to the dependence on goods produced abroad (imports). When imports exceed exports, it implies that the country is creating jobs for its trading partners. Furthermore, for a country like Botswana the effect will be worse given that mining and SACU customs pool are the main sources of government revenue.

The situation necessitates the need to find out the macroeconomic determinants of balance of payments in Botswana by examining the impact of non-mining gross domestic product (GDP) on the country's BOP. The question that arises is whether Botswana will experience a BOP deficit in the absence of revenues

from the Southern African Customs Union (SACU) as well as revenues from diamonds. Previous studies on the BOP in Botswana have been based on trade balance and balance of payments surpluses. However, this paper explores a different approach by using a model which excludes mining GDP. It is important to find ways to address BOP imbalances since BOP reflects the international investment position of a country and an equilibrium ensures the country enjoys the benefits of an open economy with no adverse effects on employment.

### **3. LITERATURE REVIEW**

There is a consensus that there are three approaches to balance of payments instability and modification. Balance of payments are caused by variations between net exports (exports - imports) and net capital flows (capital outflows - capital inflows). To address BOP disequilibrium researchers used the Keynesian and the monetary approaches; the Keynesian approach comprises of the elasticity and the absorption approaches (Arize, 2000). The main tenets of the elasticity approach are based on how devaluation of a currency could improve a country's trade balance. This implies that the elasticity approach appreciates only the effects of exchange rate movements on the trade balance (see Thirlwall, 1980; Salvatore, 2013; Arize, 2000). On the other hand, the absorption approach takes into account changes in income levels brought about by a currency devaluation. It states that a BOP deficit will occur if a country consumes or absorbs more than it produces, that is, domestic spending on consumption and investment being more than income (Thirlwall, 1980) and the opposite will lead to a BOP surplus.

Researchers of modern times view balance of payments imbalances as a monetary phenomenon hence the monetary approach (Arize, 2000). They view balance of payments as a result of disequilibrium in the money market. The approach bridges the gap between export, import competing goods and the non-trade sectors (Johnson, 1977). Under this methodology the balance of payments is considered a summation of the current account, the capital account and the money account (i.e. net outflow of international reserves) (Mmualefe, 2015).

Empirical evidence shows that determinants of balance of payments slightly vary from one country to another especially across continents or even different regions within a continent. In investigating determinants of balance of payments most studies employed the cointegrated vector auto regression methods whilst a few used the autoregressive distributed lag model.

Batool, Memood, & Jadoon (2015), in investigating determinants of balance of payments in Pakistan used the Autoregressive distributed lag model (ADRL). The results indicated that an improvement in balance of payments of any country despite the continent it is located in, can be achieved only if there is an efficient management of the fiscal balance, interest rate, money supply (M1), real exchange rate and real GDP. Both money supply and real exchange rate are negatively related to balance of payments in the short-run but depict a positive relationship in the long-run (Batool, *et al.*, 2015). In addition, their study found that in developing countries an increase in interest rate led to a decline in investment and domestic production, hence, inversely related to BOP. Fiscal balance was found to have a negative impact on BOP both in the short-run and long-run.

Mavi & Sharma (2014), using a regression analysis found that almost 72% of balance of payments fluctuations in India were influenced by exchange rates, Gross Domestic Product, balance of trade, inflation

and industrial production. Furthermore, overtime exchange rates and trade openness negatively impact BOP. Osoro (2013) also used cointegration and error correction methods to investigate the determinants of balance of payments in Kenya from 1963 to 2012. Exchange rates movements, foreign direct investment and trade balance were identified as variables influencing balance of payments in Kenya in the long-run.

Balance payments fluctuations have also been investigated in Namibia using cointegrated vector autoregression methods for the period 1999 to 2009. Results from the study revealed the main determinants of balance of payments to be fiscal balance, gross domestic product and interest rate. A positive relationship was established between the balance of payments and GDP, as well as the interest rate (Eita & Gaomab, 2012). The positive impact of GDP on balance of payments implies that a significant increase of exports leads to a current account surplus hence an improvement in balance of payments (Eita & Gaomab, 2012). Furthermore, SACU (of which Botswana is a member) revenue plays a key role in offsetting the current account deficit in member states therefore a decline in this revenue may cause a crisis in these countries' balance of payments. Policy makers should therefore comprehend SACU revenue forecasts in order to avoid possibilities of macroeconomic instability (Eita & Gaomab, 2012).

#### 4. DATA AND DEFINITION OF VARIABLES

Monthly time series secondary data from January 2006 to 2016 September was used, and the sample size was mainly influenced by the availability of Botswana data in this area of study. This data was mainly sourced from different publications of Bank of Botswana and the Statistics Botswana database. Balance of payments trends, non-mining GDP, interest rate data was obtained from BoB's annual reports while trade balance data was obtained from the Botswana Financial Statistics. Data on Botswana's foreign exchange reserves was obtained from the International Monetary Fund (IMF)'s financial statistics. Data on inflation and GDP was obtained from Statistics Botswana.

##### 4.1. Model Specification

Following the general theoretical by Kallon (1994), a long run balance of payments equation for Botswana was presented as follows:

$$BOP_t = \lambda_0 + \lambda_1 NMGDP_t + \lambda_2 INT_t + \lambda_3 INF_t + \lambda_4 GDP_t \quad (i)$$

Where; BOP = balance of payments, NMGDP = non-mining GDP, INT = interest rate, INF = inflation rate, GDP = Gross Domestic Product (mining inclusive)

$$\lambda_1 > 0 \text{ or } \lambda_1 < 0; \lambda_2 < 0, \lambda_3 < 0; \lambda_4 > 0$$

##### 4.2. Definition of Variables and Expected Signs

*Non-mining GDP*; the market value of all goods and services produced in a country within a year with the exception of mining goods. Non-mining GDP is included in the model to observe if it possible to obtain a BOP surplus in the absence of mineral revenues (which are declining). Either a negative or positive relationship is expected between balance of payments and non-mining GDP. Increased non-mining GDP could be an indication of an expansion in exports hence rendering the trade balance and BOP positive. An increase in non-mining GDP also reflects efforts of diversifying the economy from the mineral sector. On

the other hand, increased non-mining GDP indicates that imports are growing faster hence resulting in a negative trade balance.

*Interest rate*; as measured by the prime rate, it is simply the cost of borrowing. An increase in real interest rates will reduce the demand for liquid assets (specifically money), as a result there will be an excess supply of money since people will want to hold interest-bearing assets such as bonds and less money. High interest rates reduce the money available for investment and this negatively affects the trade balance. This implies that a negative relationship exists between interest rates and BOP.

*Inflation*; it is the general increase in the price level. Inflation is measured by the consumer price index. A negative relationship is expected between inflation and balance of payments. An increase in domestic prices makes imports more affordable relative to exports thus reducing the number of units of consumed goods, consequently trade balance deteriorates leading to a negative balance of payments.

*GDP*; the market value of all goods and services produced in a country within a given period of time, usually a year. A positive relationship is expected between balance of payments and GDP (mining included), since history depicts that current account surpluses that Botswana maintained were mainly attributable to diamonds revenues.

## 5. METHODOLOGY

This study adopted the Vector Autoregression (VAR) method. VAR is used to analyse the influence of random shocks and to correct for autocorrelation (Gujarati & Porter, 2009). For this study, the VAR system is as follows:

$$BOP_t = \lambda_0 + \lambda_1 BOP_{t-1} + \lambda_2 NMGDP_{t-1} + \lambda_3 INT_{t-1} + \lambda_4 INF_{t-1} + \lambda_5 GDP_{t-1} + \varepsilon_{it} \quad (ii)$$

Where  $BOP_t$  is a  $5 \times 1$  matrix and each of the explanatory variables represent a  $5 \times 5$  matrix;  $\varepsilon_{it}$  is a  $5 \times 1$  vector of residuals and it represent random shocks. Equation (ii) shows that  $BOP_t$  is explained by both present and past values of NMGDP, INT, GDP and INF (i.e. feedback effect).

In instances where VAR coefficients are statistically insignificant, results are analysed by the use of impulse response functions and variance decompositions (Gujarati & Porter, 2009). The VAR assumes that all variables are endogenous, and the OLS method can be used to estimate each equation separately. The type of VAR method to be employed depends on whether non-stationary variables are cointegrated or not.

## 6. EMPIRICAL INVESTIGATION AND RESULTS

Augmented Dickey Fuller (ADF) and the Phillips-Perron tests (i.e. unit root tests) were used to determine stationarity. Variables are said to be stationary if their mean and variance are constant overtime. However, most macroeconomic variables are non-stationary. Since non-stationary data produces spurious results, there is need to perfect data to stationarity. The unit root test results are presented below:

The results showed that all variables are nonstationary at level using both the Augmented Dickey Fuller (ADF) and Phillip-Perron tests (see appendix). The Phillip-Perron was done to confirm the results of the ADF. Both tests proved that at levels with intercept only as well as with the inclusion of a trend, the calculated t-statistic in absolute terms is less than the critical t-statistic at all levels of significance. All variables became stationary after being first differenced as affirmed by both the ADF Phillip-Perron tests. However, the log of non-mining GDP became stationary at first difference with the inclusion of a trend.

Since the unit root test revealed the non-stationarity of variables at levels, the Johansen-Juselius maximum likelihood test was undertaken to determine cointegration. Cointegration is the existence of the long-run relationship between or among variables. The test was conducted on log of Balance of Payments (LNBOP), Gross Domestic Product (GDP), Interest rate (INT), inflation (INF), and the log of non-mining GDP (LNNMGDP). The trace and max-eigen statistics revealed that there are no cointegrating equations at 5% significance level. That is, there is no long-run relationship among the four variables. i.e. using the mining GDP as well as with non-mining GDP (see appendix for output on the VAR estimates).

### **6.1. Vector Auto Regression (VAR) Framework**

There two types of VAR models namely the unrestricted and restricted VAR. The restricted VAR is also known as the Vector Error Correction Model (VECM). If the series are non-stationary but cointegrated VECM is used whereas unrestricted VAR is used when the series are non-stationary but not cointegrated. In the absence of cointegration (as revealed by the Johansen Cointegration Test for this study – see appendix), the unrestricted Vector Auto Regressive model was used.

### **6.2. Impulse Response Function (IRF)**

VAR models are interpreted using the impulse response function. IRF shows how each variable, keeping others constant, respond to any shock in the short run. This study focuses only on the response of BOP to any shock in one of the explanatory variables. If any variable starts at more than zero, it implies that BOP responds vigorously to a one-time shock in that variable. The results of the generalised impulses below reveal that BOP vigorously respond to a shock in any of the variables in the short run. Focusing on the response of BOP to a shock in LNNMGDP and GDP respectively, BOP responds to a one-time shock in LNNMGDP and GDP by declining eventually reaching zero. From the 8<sup>th</sup> year onwards BOP responded negatively. The sensitivity of BOP to a shock in the above-mentioned variables could be because for a very long time Botswana has managed to maintain a trade balance and BOP surplus attributable to mineral revenues, so a shock in GDP affects the main account of BOP (the current account). Additionally, a shock in these variables implies a shock in merchandise trade thus affecting the overall trade balance. Balance of payments responded negatively to any change in interest rate. This is consistent with macroeconomic theory that an increase in interest rate reduces money available for investment, a decline in domestic investment negatively affects trade balance as well as balance of payments. Balance of payments responded negatively to a shock in inflation, this is because a general rise in domestic prices make imports relatively cheaper than exports and attractive to consumers and this results in a negative trade balance. From all the responses of balance of payments to a shock in each explanatory variable, it is evident that balance of payments responds more vigorously to a shock in GDP (inclusive of mining revenues), this corresponds to the fact that Botswana is heavily reliant on the mineral sector.

A positive shock in LNNMGDP increased BOP until it reached a maximum after 4 years, then it decreased, as shown by the Cholesky impulse response below. This is consistent with the expected results that increased non-mining GDP could be an indication of an expansion in exports hence rendering the trade balance and BOP positive. The decrease in BOP, on the other hand may indicate that imports are growing faster than exports.



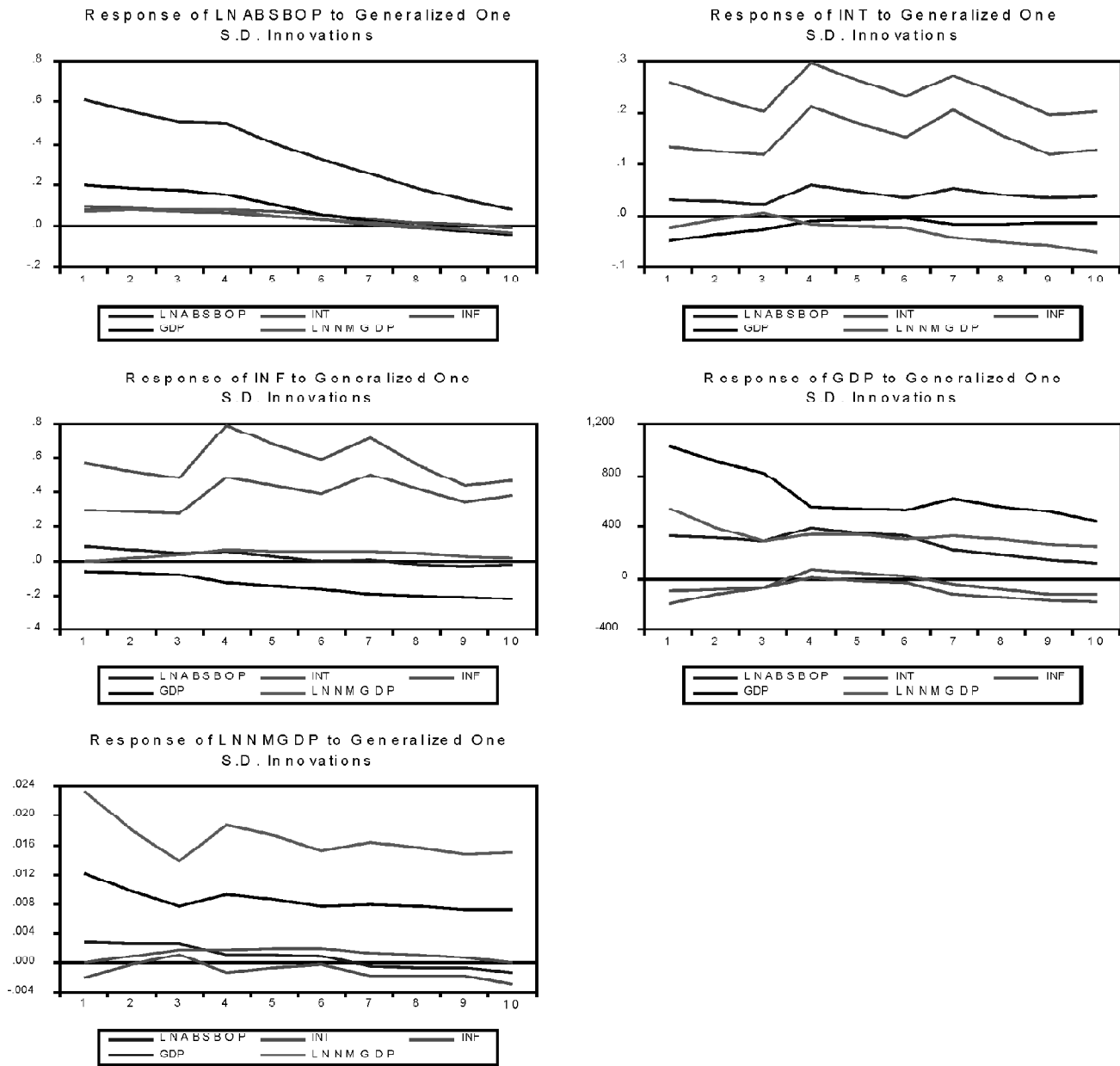


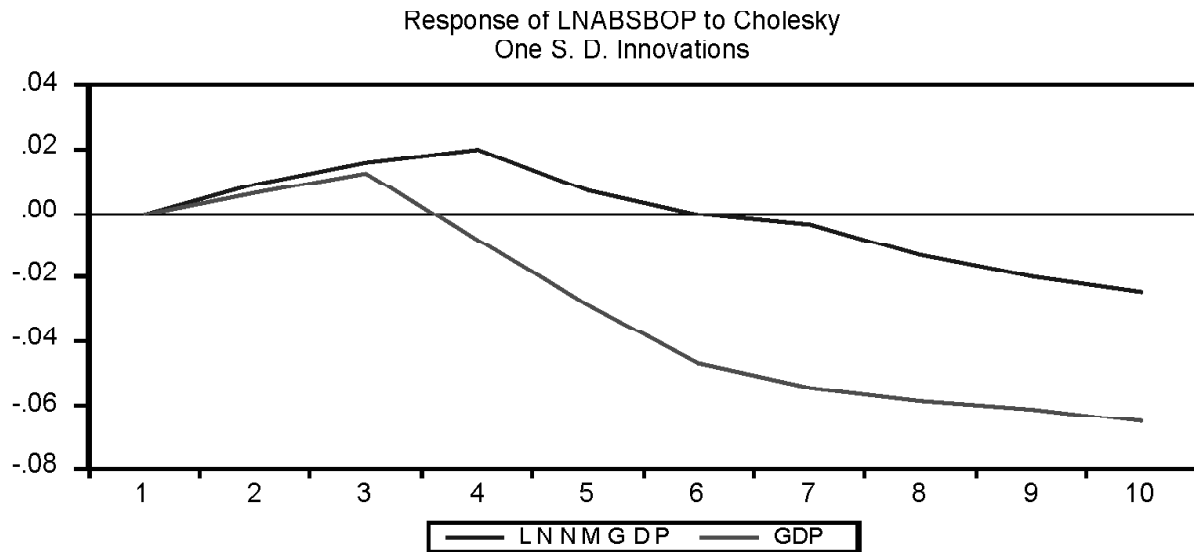
Figure 2: Generalized Impulse Response Functions

Source: Author's calculations from the data compiled from various sources.

From the results in figure 3 below, it can also be concluded that BOP responds faster to a shock in GDP where mining is included relative to a shock in non-mining GDP thus stressing the importance of mineral revenue in determination of Botswana's BOP.

## 7. CONCLUSION

This objective of this paper was to establish the macroeconomic determinants of the balance of payments in Botswana. After establishing that there is no long-run relationship (no cointegration) among variables,



**Figure 3: Cholesky Impulse Response Function**

*Source:* Author's calculations from the data compiled from various sources.

the role of explanatory variables on balance of payments stability was estimated and explained using the impulse response function (see section 6.2).

An interesting finding from the study is that BOP responds faster to a change (shock) in mining GDP compared to when there is a change in non-mining GDP. This shows the significance of mineral revenue in determining BOP in Botswana. Further, it corresponds to the fact that the consistent maintenance of current account surpluses in Botswana is attributable to mineral revenues. However, it is strongly recommended that there be an accumulation of foreign reserves through the expansion of the non-mining sector, as well as the expansion of exports to ensure a positive balance of trade. Further, to address balance of payments instability, monetary authorities should manage movements in inflation to make locally produced goods competitive which in turn improves the current account.

APPENDIX

A. Unit Root Test Results

Variables	ADF level		Phillip-Perron level		ADF first difference		Phillip-Perron first difference	
	Intercept	Intercept and Trend	Intercept	Intercept and Trend	Intercept	Intercept and Trend	Intercept	Intercept and Trend
LNBOP	-2.1945 (0.2094)	-2.7873 (0.2047)	-2.3452 (0.1596)	-3.0900 (0.1132)	-11.19* (0.000)	-11.15* (0.000)	-11.19* (0.000)	-11.15* (0.000)
GDP	0.005761 (0.9567)	-3.3262 (0.0667)	0.935957 (0.9957)	-3.21604 (0.0859)	-11.72* (0.000)	-11.72* (0.000)	-13.81* (0.000)	-15.35* (0.000)
INT	-0.8127 (0.8118)	-2.7299 (0.2266)	-0.5476 (0.8768)	-2.2837 (0.4394)	-4.038* (0.0017)	-11.96* (0.000)	-12.00* (0.000)	-11.96* (0.000)
INF	-1.66214 (0.4480)	-3.1910 (0.0910)	-1.0017 (0.7514)	-2.2765 (0.4432)	-3.608* (0.0069)	-3.59** (0.0345)	-11.78* (0.000)	-11.75* (0.000)
LNNMGDP	-2.6728 (0.0819)	-1.8051 (0.6961)	-2.22142 (0.1998)	-2.6448 (0.2615)	-2.6724 (0.0819)	-3.68** (0.0274)	-15.86* (0.000)	-18.95* (0.000)

Note: \*, \*\* and \*\*\* implies that the series is significant at 1%, 5% and 10% levels of significance respectively and the figures in parenthesis are the probabilities.

B. Unrestricted Cointegration Rank Test (Trace and Maximum Eigen Statistics)

(i) Estimating long-run equilibrium with GDP (mining included)

Hypothesized No. of CE(s)	Eigen Value	Trace Statistics	0.05 Critical Value	Max-Eigen Statistics	0.05 Critical Value
None	0.169466	39.52570	47.85613	23.02508	27.58434
At most 1	0.103599	16.50061	29.79707	13.56155	21.13162
At most 2	0.023236	2.939058	15.49471	2.915327	14.26460
At most 3	0.000191	0.023732	3.841466	0.023732	3.841466

Source: Author's calculations from the data compiled from various sources.

(ii) Estimation of long-run equilibrium with non-mining GDP

Hypothesized No. of CE(s)	Eigen Value	Trace Statistics	0.05 Critical Value	Max-Eigen Statistics	0.05 Critical Value
None	0.126511	36.35500	47.85613	16.77223	27.58434
At most 1	0.093680	19.58277	29.79707	12.19701	21.13162
At most 2	0.036846	7.385757	15.49471	4.655150	14.26460
At most 3	0.021780	2.730608	3.841466	2.730608	3.841466

**C. Vector Autoregression Estimates**

Sample (adjusted): 2006M05 2016M09

Included observations: 125 after adjustments

Standard errors in ( ) &amp; t-statistics in [ ]

	<i>BOP</i>	<i>GDP</i>	<i>INT</i>	<i>INF</i>	<i>LNNMGDP</i>
BOP(-1)	0.934195 (0.11341) [8.23706]	-4.41E-05 (0.05321) [-0.00083]	-1.34E-06 (1.3E-05) [-0.10255]	-2.22E-07 (3.7E-06) [-0.06069]	-3.90E-08 (1.2E-06) [-0.03171]
BOP(-2)	-2.33E-13 (0.15293) [-1.5e-12]	3.56E-13 (0.07175) [5.0e-12]	-1.65E-17 (1.8E-05) [-9.4e-13]	1.10E-17 (4.9E-06) [2.2e-12]	-1.51E-17 (1.7E-06) [-9.1e-12]
BOP(-3)	-0.010616 (0.15327) [-0.06926]	0.124021 (0.07191) [1.72465]	3.97E-05 (1.8E-05) [2.25545]	-2.05E-06 (5.0E-06) [-0.41475]	4.52E-07 (1.7E-06) [0.27167]
BOP(-4)	-0.010309 (0.12034) [-0.08567]	-0.111514 (0.05646) [-1.97513]	-2.68E-05 (1.4E-05) [-1.94159]	3.36E-06 (3.9E-06) [0.86499]	-5.50E-07 (1.3E-06) [-0.42111]
GDP(-1)	0.005801 (0.25408) [0.02283]	0.941714 (0.11921) [7.89973]	-6.60E-06 (2.9E-05) [-0.22613]	-5.57E-06 (8.2E-06) [-0.67897]	5.78E-07 (2.8E-06) [0.20947]
GDP(-2)	1.14E-12 (0.33127) [3.5e-12]	-3.50E-12 (0.15542) [-2.3e-11]	-2.31E-16 (3.8E-05) [-6.1e-12]	-1.66E-16 (1.1E-05) [-1.6e-11]	6.45E-17 (3.6E-06) [1.8e-11]
GDP(-3)	0.036567 (0.33319) [0.10975]	-0.467230 (0.15632) [-2.98887]	2.55E-05 (3.8E-05) [0.66567]	-7.13E-07 (1.1E-05) [-0.06621]	-2.05E-06 (3.6E-06) [-0.56687]
GDP(-4)	0.001912 (0.26245) [0.00729]	0.403315 (0.12313) [3.27545]	-2.32E-05 (3.0E-05) [-0.76918]	-5.55E-06 (8.5E-06) [-0.65412]	1.85E-06 (2.8E-06) [0.65034]
INT(-1)	100.7789 (906.467) [0.11118]	274.3998 (425.289) [0.64521]	0.844556 (0.10409) [8.11393]	0.004038 (0.02929) [0.13789]	0.006101 (0.00984) [0.61982]
INT(-2)	1.97E-09 (1124.80) [1.7e-12]	3.74E-09 (527.723) [7.1e-12]	-2.07E-14 (0.12916) [-1.6e-13]	2.36E-13 (0.03634) [6.5e-12]	-5.73E-13 (0.01221) [-4.7e-11]
INT(-3)	314.3487 (1125.41) [0.27932]	-206.4859 (528.013) [-0.39106]	0.351528 (0.12923) [2.72021]	0.060010 (0.03636) [1.65042]	-0.011571 (0.01222) [-0.94691]
INT(-4)	-553.2256 (840.679) [-0.65807]	-150.6646 (394.423) [-0.38199]	-0.288800 (0.09653) [-2.99173]	-0.064842 (0.02716) [-2.38734]	0.004077 (0.00913) [0.44662]

*Macroeconomic Determinants of Balance of Payments in Botswana*

INF(-1)	-257.6547 (3153.51) [-0.08170]	-397.0758 (1479.54) [-0.26838]	0.191556 (0.36211) [0.52900]	0.931398 (0.10188) [9.14169]	0.002264 (0.03424) [0.06611]
INF(-2)	1.06E-09 (4222.99) [2.5e-13]	5.44E-09 (1981.31) [2.7e-12]	3.57E-12 (0.48491) [7.4e-12]	4.14E-13 (0.13644) [3.0e-12]	1.69E-12 (0.04585) [3.7e-11]
INF(-3)	-991.8468 (4223.68) [-0.23483]	318.5622 (1981.63) [0.16076]	0.637030 (0.48499) [1.31348]	0.431989 (0.13646) [3.16569]	0.005923 (0.04586) [0.12915]
INF(-4)	745.1028 (3062.44) [0.24330]	-360.1986 (1436.81) [-0.25069]	-0.856939 (0.35165) [-2.43690]	-0.460427 (0.09894) [-4.65350]	-0.007319 (0.03325) [-0.22011]
LNNMGDP(-1)	2896.016 (10456.6) [0.27696]	-4373.784 (4905.92) [-0.89153]	0.811145 (1.20070) [0.67556]	0.245450 (0.33783) [0.72654]	0.772341 (0.11354) [6.80230]
LNNMGDP(-2)	-7.77E-08 (13014.4) [-6.0e-12]	2.51E-07 (6105.98) [4.1e-11]	3.02E-11 (1.49440) [2.0e-11]	1.43E-11 (0.42047) [3.4e-11]	-7.97E-12 (0.14132) [-5.6e-11]
LNNMGDP(-3)	2774.776 (13014.6) [0.21320]	15874.14 (6106.09) [2.59972]	-1.663469 (1.49443) [-1.11311]	0.159699 (0.42048) [0.37980]	0.366700 (0.14132) [2.59486]
LNNMGDP(-4)	-8372.223 (10549.8) [-0.79359]	-9747.776 (4949.68) [-1.96938]	0.209593 (1.21141) [0.17302]	-0.238998 (0.34085) [-0.70119]	-0.167447 (0.11455) [-1.46174]
C	28176.14 (38712.0) [0.72784]	-11943.35 (18162.6) [-0.65758]	7.498448 (4.44519) [1.68687]	-1.152489 (1.25072) [-0.92146]	0.299260 (0.42035) [0.71193]
R-squared	0.888457	0.987730	0.994872	0.980614	0.996410
Adj. R-squared	0.867006	0.985370	0.993886	0.976886	0.995720
Sum sq. resids	4.86E+08	1.07E+08	6.401976	0.506819	0.057247
S.E. equation	2160.706	1013.742	0.248108	0.069809	0.023462
F-statistic	41.41867	418.5848	1008.910	263.0396	1443.342
Log likelihood	-1125.646	-1031.048	8.364377	166.8773	303.1758
Akaike AIC	18.34633	16.83276	0.202170	-2.334037	-4.514813
Schwarz SC	18.82149	17.30792	0.677327	-1.858880	-4.039656
Mean dependent	2888.960	26393.77	11.79120	1.855557	9.881098
S.D. dependent	5924.882	8381.162	3.173123	0.459172	0.358616
Determinant resid covariance (dof adj.)	267837.9				
Determinant resid covariance	106779.7				
Log likelihood	-1610.494				
Akaike information criterion	27.44791				
Schwarz criterion	29.82369				

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