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THE DETERMINANTS OF BALANCE OF PAYMENTS IN BOTSWANA

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ABSTRACT

This study examined the determinations of Balance of Payments in Botswana using annual data from 1980 to 2014 and the error correction model (ECM). The results showed that the balance of payments in Botswana are positively and significantly influenced by balance of trade, real gross domestic product, but negatively and significantly influenced money supply and real exchange rates. From the policy perspective, selective use of monetary policy instruments by the Government of Botswana is critical to maintain stable balance of payments.

1. INTRODUCTION

Balance of payments is a record keeping mechanism that follows a double entry system in which a country's inflows and outflows of transactions with the rest of the world are captured. Payments to foreigners are negative and represent a debit whilst receipts from foreigners are positive and represent a credit to the account, over a specified period, usually one year. Deficits imply exchange rates depreciation or a draw on international reserves whilst a surplus will cause appreciation of currency or increase in international reserves (Krugman & Obstfeld, 2003).

The Balance of payments (BOP) account is made up of the current account and the capital account. The current account mainly consists of transactions of goods and services whilst the capital account measures the inflow and outflow of capital. When there is equilibrium in the balance of payments, this means that the country has a sound economic position, whereas disequilibrium in the balance of payments indicates unsatisfactory economic position of a country (Krugman & Obstfeld, 2003; Bank of Botswana, 2013). IMF (2000) adds that

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this balance of payments problem occurs because of imbalance in physical flows such as exports and imports of goods and services.

The main importance of the BOP is that it provides information about the overall health status of the economy. It also serves as an indicator for hidden economic crises which provides foreign creditors with vital information (Hyllenbeg & Mizan, 1989).

There are three approaches to explaining the BOP, namely, the absorption approach, the elasticity approach as well as the monetary approach. The elasticity approach takes into account that devaluation of a currency improves the balance of payments if only the price elasticity of domestic and foreign demand for imports is greater than unity, which is known as the Marshall-Learner condition (Robison, 1937). The J-curve effect which shows that devaluation worsens BOP in the short-run, but improves it in the long-run, is also used in the elasticity approach. The absorption approach takes into account the income effects of devaluation and how that can improve BOP (Alexander, 1952). Lastly, Mundel (1971) explains BOP in terms of demand and supply of money and suggests that BOP is a monetary phenomenon, hence BOP can be corrected with the help of international reserves.

The overall trend of the BOP for Botswana has largely been positive. According to the Ministry of Finance and Development Planning [MFDP] (2015), "the balance of payments continued to record strong performance during 2014 with increasing surpluses by 1.5% from P12.9 billion in 2013 to P13.1 billion in 2014". This increase was mainly attributed to increase in receipts from Southern African Customs Union (SACU). However, the MFDP (2016) indicated a decrease of BOP to P3.3 billion as at November 2015 from P11.4 billion recorded in 2014. Nevertheless, this decrease was associated with the weak global demand for rough diamonds.

A BOP surplus does not necessarily imply a good economy and neither does a deficit imply the opposite, but a consistent deficit is a macroeconomic indicator of a country's declining trade position. Since BOP reflects transactions between a country and the rest of the world, it also determines the supply and demand for money. The disequilibrium produces adverse effects on the aggregate expenditure for goods and services because of the excess supply of money (IMF, 2000). It is thus important to establish a relatively stable BOP such that deficits do not overburden the currency.

The BOP account is an important indicator for monetary and fiscal policy. The performance of BOP over time can be used to establish appropriate exchange rate regimes. Consistent deficits have in the past caused some economies to switch to flexible exchange rate systems. It therefore becomes imperative for policy makers to know what channels they could use to correct and stabilize BOP (Eiteman, Stonehill, & Moffett, 1995). Knowing the determinants of BOP will help formulate policies precisely and avoid unwanted effects on the economy (Osoro, 2013). This paper therefore examines the determinants of BOP in Botswana.

2. LITERATURE REVIEW

2.1. Theoretical Literature Review of Balance of Payments

There are three approaches to analyzing the balance of payments which include the elasticity approach, the absorption approach and the monetary approach.

2.1.1. The Elasticity Approach

The elasticity approach to the BOP was proposed by Robinson (1937) and Metzler (1948). According to the theory, instability in the BOP is the result of disparity between domestic and foreign prices. The disparities between prices are corrected by means of devaluation (Stojanov, 2006). Mavi and Sharma (2014) further argued that the elasticity approach holds that BOP problems are due to disequilibrium in the physical trade flows of exports and imports. This approach can be analyzed on the basis of partial elasticities of the exports and imports and the exchange rate in the adjustment of BOP to currency devaluation.

2.1.2. The Absorption Approach

The absorption approach emerged at the beginning of 1950s from the works of Harberger (1950); Meade (1951) and Alexander (1952). The theory analyses the economy from the point of view of aggregate expenditure focussing on the direct effect of exchange rate changes on relative prices, income and absorption, and ultimately, trade balance. It shows that currency depreciation can improve the current account since it depends on its effect on national income and on domestic absorption. The outcome of devaluation depends on its direct impact on absorption which discourages investment and consumption because of the ambiguous net effect (Giancarlo, 2002).

2.1.3. The Monetary Approach

The monetary view of the BOP argues that the BOP is essentially a monetary phenomenon (Polak, 1957; Hahn, 1959; Pearce, 1961; Prais, 1961; Mundell, 1968; Johnson, 1977; Dhliwayo, 1996). The theory was developed under conditions of fluctuating exchange rates. It is founded on the premise of global monetarism and proceeds from the relations between the money demand and money supply as the basic determinants of the exchange rate. Money demand is stable in the long term while money supply is variable. The growth of money supply affects absorption, increases it, and also leads to an upward trend in prices. According to the premises of the "law of one price", commodity arbitrage leads to a deficit in the BOP. Over a short term, the deficit in the BOP causes depreciation of the currency. The depreciation of currency deflates the nominal money supply, reduces absorption to the available frameworks and leads to a stabilization of the BOP (Stojanov, 2006).

2.2. Empirical Literature Review

Many studies have been done to establish the determinants of BOP in both developing and developed countries. For most countries, the key variables that

influence balance of payments include exchange rates, money supply, real gross domestic product, inflation, balance of trade, and foreign direct investment. The other variables also cited in the literature include terms of trade and interest rates.

Exchange Rates

Many studies have observed that there is a negative and statistically significant relationship between exchange rates and BOP. Exchange rate in the context of this paper is defined as local currency (Pula) per US dollar, implying that an increase in the exchange rate denotes a depreciation while a decrease implies an appreciation. For most developing countries, the Marshal-Lerner condition does not hold such that a depreciation of the exchange rate or devaluation in the currency makes the exports cheap and imports expensive which lead to worsening of balance of payments (Kennedy, 2013; Chiawa, Asare & Dauran, 2013; Mavi & Sharma, 2014; Oladipupo & Onotaniyohuwo, 2011; Chowdhury, 2013). Moreover, though the studies conducted by Eita & Gaomab (2012); Batool, Memood & Jadoon (2015) also noted a negative but statistically insignificant relationship between exchange rate and balance of payments. However, some scholars observed a positive and statistically insignificant relationship between the exchange rate and BOP (Ajayi, 2014; Gureech, 2014; Tijani, 2014).

Money Supply

Empirical evidence suggests that there is a negative and statistically significant relationship between money supply and BOP (Ajayi, 2014; Gureech, 2014; Oladipupo & Onotaniyohuwo, 2011). By intuition, consistent increase in money supply leads to inflation which has a negative impact on BOP in the long run. Conversely, a study by Batool, Memood & Jadoon (2015) observed that there is a positive and significant relationship between money supply and BOP. The explanation of the result is drawn from the monetarists theory, where an increase in money supply leads to an overall improvement of BOP.

Real Gross Domestic Product (RGDP)

Studies found a negative and significant relationship between RGDP and balance of payments. By intuition, increase in real income encourages citizens to buy more of the imported goods; hence imports will rise and thus worsens the BOP (Chowdhury, 2013; Duasa, 2007; Tijani, 2014).

However some studies observed a positive and statistically significant relationship between RGDP and the BOP. By intuition, according to absorption approach theory of BOP, an increase in real income leads to an increase in net exports which will cause the BOP to improve (Boateng & Ayentimi, 2013; Adamu & Itsede, 2010; Batool, Memood & Jadoon, 2015; Mavi & Sharma, 2014; Eita & Gaomab, 2012).

Inflation

Mavi & Sharma (2014); Chiawa, Asare & Dauran (2013) observed that there is a negative and significant relationship between inflation rate and BOP. By intuition, high rates of inflation result in depreciation of exchange rates with attendant negative effects on BOP. On the other hand, some studies found a negative but insignificant relationship between inflation and BOP (Tijani, 2014; Boateng & Ayentimi, 2013; Oladipupo & Onotaniyohuwo, 2011).

Balance of Trade (BOT)

A study conducted by Mavi & Sharma (2014) observed that there is a positive and significant relationship between balance of trade and BOP in India. By intuition the balance of trade is a component of the BOP and therefore they move in the same direction hence a positive relationship. Though the study done by Tijani (2014) obtained the same results, they found the relationship to be insignificant. Conversely, Chiawa, Asare & Dauran (2013); Kennedy (2013) noted that there is negative relationship between and balance of trade and balance of payments in Nigeria and Kenya respectively. By intuition, the capital account may have more influence on the BOP than the current account.

Foreign Direct Investment (FDI)

A study conducted for Kenya by Kennedy (2013) observed that there is negative and statistically significant relationship between FDI and BOP. By intuition, for most developing countries, increase in FDI is followed by increase in imports because most countries import production inputs from abroad. An increase in imports has a negative impact on BOP.

Terms of Trade

A study conducted in Bangladesh by Chowdhury (2013) observed that there is a positive and significant relationship between terms of trade and trade balance. Another study by Gureech (2014) agrees that there is a positive and statistically significant relationship between terms of trade and BOP in Kenya. Conversely, Chiawa, Asare & Dauran (2013) found that there is a negative and significant relationship between terms of trade and BOP, this means that an increase in terms of trade leads to a decrease in BOP. By intuition, successful countries are those whose export restrictions have been relaxed relative to import restrictions.

Interest Rates

Empirical evidence suggests that there is a negative and statistically significant relationship between interest rates and BOP (Dhliwayo, 1996; Ajayi, 2014; Batool, Memood & Jadoon, 2015; Boateng & Ayentimi, 2013). By intuition, increase in interest rates leads to an increase in the cost of capital, hence discourages investment. This then means the domestic production will become

more expensive resulting in reduction in balance of payments. By implication, high interest rates do not necessarily attract portfolio investment, hence leads to a decrease in BOP. Moreover, Oladipupo & Onotaniyohuwo (2011) also observed that in Nigeria, interest rates have a positive relationship with BOP though the relationship was found to be statistically insignificant. Conversely, Eita & Gaomab (2012) observed that there is a positive and statistically significant relationship between interest rates and BOP in Namibia.

Domestic Credit

The majority of studies observed that there is a negative and statistically significant relationship between domestic credit and BOP (Boateng & Ayentimi, 2013; Adamu & Itsede, 2010). However, some studies have found a positive and statistically significant relationship between domestic credit and balance of payments (Tijani, 2014; Oladipupo & Onotaniyohuwo, 2011).

3. METHODOLOGY

3.1. Model Specification

Based on theoretical and empirical literature, a country's balance of payments (BOP) are affected by real gross domestic product (RGDP), money supply (M2GDP), balance of trade (BOT), inflation proxied by consumer price index (CPI), foreign direct investment (FDI) and real exchange rates (REER). The model was adopted from Batool, Memood & Jadoon (2015) which incorporates all three approaches in a single equation model to verify their empirical implication and validity and minimize the residual unexplained variation in the BOP model.

The Model for General Approach to BOP is presented by the following equation:

$$BOP_t = \beta_0 + \beta_1 RGDP_t + \beta_2 REER_t + \beta_3 CPI_t + \beta_4 FDI_t + \beta_5 BOT_t + \beta_6 M2GDP_t + \varepsilon_t$$

Where:

BOP = Balance of Payments; RGDP = Real Gross Domestic Product; REER = Real Exchange Rate; CPI = Consumer Price Index; FDI = Foreign Direct Investment; BOT = Balance of Trade; M2GDP = Money Supply; β_i = Coefficients.

3.2. Variable Definitions and Expected Signs

The definition of the selected variables is according to the UNCTAD and African Development Indicators as shown in Table 1.

Table 1
Variable Definitions and Expected Signs

Variable	*Measurement*	*Expected Signs*
	Dependent Variable	
Balance of Payments (BOP)	Current and Capital Account Balance, in millions of dollars expressed as percentages of GDP	
	Independent Variables	
Consumer Price Index (CPI)	Computed using 2000 and 2005 base prices. Based on the weighted average of prices of a basket of consumer goods and services, purchases by a consumer taking price changes for each item in the predetermined basket of goods and services during a month.	Negative
Foreign Direct Investment (FDI)	Contains inward and outward flows of stock expressed in millions of dollars. It includes equity, capital and reinvested earnings and intra-company loans	Negative
Real Domestic Product (GDP)	Is measured using expenditure approach. It is measured in US Dollars at current prices and current exchange rates in millions.	Negative
Real Exchange Rates (REER)	The National currency (Pula) per US dollar	Negative
Money Supply (M2GDP)	M2 as a percentage of GDP comprises the sum of currency outside banks, demand deposits other than those of the central government, and the time, savings, and foreign currency deposits of resident sectors other than the central government.	Negative
Balance of Trade (BOT)	Normalized trade balance indicator is used as a proxy for BOT. The indicators are calculated for trade in goods, trade in services and total trade in goods and services and the Normalized trade balance of goods and services is defined as the trade balance (total exports less total imports) divided by the total trade (exports plus imports)	Positive

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E-Views was used for tests of time series properties of the variables of interest (unit root tests, cointegration tests) and estimation of the model following Greene (2003) and Engle and Granger (1987).

3.3. Data Sources

This study used annual time series data and covered the period from 1980 to 2014. The data for all the variables used were obtained from the United Nations Conference on Trade and Development (UNCTAD) except money supply which was sourced from African Development Indicators.

4. RESULTS AND ANALYSIS

4.1. Unit Root Test Results

The results of the time series stationarity tests based on Dickey- Fuller (DF), Augmented Dickey Fuller (ADF) and the Philips Perron (PP) are shown in the Table 2. The results show that all the variables are first difference stationary except FDI which is stationary at levels.

Table 2
Unit Root Test Results

Variables	*UNIT ROOT TEST*								
	Dickey Fuller (DF)			*Augmented Dickey Fuller (ADF)*			*Phillips Perron (PP)*		
	Statistic	*Prob*	*Order*	*statistic*	*Prob*	*Order*	*Statistic*	*Prob*	*Order*
BOP	-3.868	0.0006*	I(0)	-3.88	0.006*	I(0)	-1.985	0.29	I(1)
D(BOP)	-4.68	0.0001*	I(0)	-4.78	0.0006*	I(0)	-4.577	0.0009*	I(0)
BOT	-2.22	0.03**	I(0)	-2.56	0.1114	I(1)	-2.51	0.122	I(1)
D(BOT)	-5.269	0.0000*	I(0)	-6.765	0.0000*	I(0)	-6.67	0.0000*	I(0)
CPI	-1.786	0.08	I(0)	8.93	1.0000	I(1)	7.607	1.00	I(1)
D(CPI)	-0.1627	0.87	I(0)	-1.008	0.738	I(1)	-3.03	0.04**	I(0)
FDI	-3.23	0.0028**	I(0)	-3.29	0.023**	I(0)	-3.25	0.0257	I(0)
RGDP	1.37	0.179	I(1)	0.9227	0.9946	I(1)	2.346	0.9999	I(1)
D(RGDP)	-5.44	0.000*	I(0)	-5.46	0.0001*	I(0)	-5.439	0.0001*	I(0)
REER	-1.233	0.2261	I(1)	-1.22	0.6538	I(1)	-1.22	0.6538	I(1)
D(REER)	-5.917	0.000*	I(0)	-5.824	0.000*	I(0)	-5.824	0.000*	I(0)
M2GDP	-4.211	0.0001*	I(0)	-4.123	0.0039*	I(0)	-1.697	0.4228	I(1)
D(M2GDP)	-3.345	0.0023*	I(0)	-3.3099	0.02**	I(0)	-3.192	0.03**	I(0)

** Significant at 5% * Significant at 1%

4.2. Cointegration Test Results

Since most variables are non-stationary, the Johansen Cointegration test was conducted. The results show (Table 3) that the null hypothesis for no cointegration is rejected at 1% level of significance implying that there is cointegration. The trace test shows that the presence of 2 cointegrating equations as does the eigenvalue tests. Based on this, we can conclude that there is cointegration and hence a long-run relationship.

Table 3
Johansen Cointegration Test Results

Null HO	*Eigen value*	*Max. Eigen Statistic*	*0.05% critical values*	*Prob***	*0.05% critical values*	*Trace Statistic*	*Prob***
r=0	0.856545	58.25193*	95.75366	0.0002	40.07757	161.4673*	0.0000
r ≤ 1	0.770101	44.10345*	69.81889	0.0022	33.87687	103.2154*	0.0000
r ≤ 2	0.692257	35.35475*	47.85613	0.0041	27.58434	59.11191*	0.0031
r ≤ 3	0.366472	13.69353	29.79707	0.3907	21.13162	23.75716	0.2109
r ≤ 4	0.282844	9.973859	15.49471	0.2137	14.26460	10.06364	0.2759
r ≤ 5	0.002988	0.089778	3.841466	0.7644	3.841466	0.089778	0.7644

* denotes rejection of the null hypothesis at the 5%

4.3. Econometric Estimation Results

Based on the unit root and cointegration test results which suggested that most of the variables of interest were first difference stationary and were cointegrated, the Error Correction Model (ECM) was used to estimate the determinants of balance of payments in Botswana.

Table 4
Error Correction Model (ECM) Estimation Results

Dependent Variable: D(BOP)
Method: Least Squares
Date: 04/21/16 Time: 18:41
Sample (adjusted): 1987 2007
Included observations: 14 after adjustments
Convergence achieved after 12 iterations

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
D(BOT)	0.840658	0.214621	3.916946	0.0112
FDI	-0.062916	0.129903	-0.484330	0.6486
D(RGDP)	1.749418	0.737766	2.371237	0.0639
D(M2GDP)	-0.097204	0.021484	-4.524364	0.0063
D(REER)	-0.121314	0.058239	-2.083042	0.0917
D(CPI)	0.026335	0.056805	0.463604	0.6624
ECM(-1)	-0.664944	0.320451	-2.075027	0.0926
C	0.257137	0.320319	0.802752	0.4586
R-squared	0.975743	Mean dependent var		0.193938
Adjusted R-squared	0.936933	S.D. dependent var		0.979296
S.E. of regression	0.245932	Akaike info criterion		0.288573
Sum squared resid	0.302413	Schwarz criterion		0.699396
Log likelihood	6.979987	Hannan-Quinn criter.		0.250544
F-statistic	25.14119	Durbin-Watson stat		2.133657
Prob (F-statistic)	0.001256			

Where D(*) denotes the first difference operator.

As shown in the Table 4, the balance of payments (BOP) is positively and significantly influenced by balance of trade (BOT). This is in line with economic theory as the BOT is a section of the BOP and so they move in the same direction. Therefore if there are positive net exports then there will be an increase in the BOP. Similar results were obtained by Chowdhury (2013) in Bangladesh and by Gureech (2014) in Kenya. This shows that the earnings from export and import have a significant effect of foreign reserves in Botswana.

Foreign Direct Investment (FDI) has a negative but statistically insignificant effect on BOP. This is expected as FDI affects BOP through imports as most developing countries import inputs for production. An increase in imports will reduce the BOT and consequently affect the BOP negatively. Similar results were observed by Mavi & Sharma (2014).

Real Gross Domestic Product (GDP) is positively and significantly related to the BOP, which result was unexpected. The expectation was that an increase in real RGDP would lead to an increase in demand for imports which tend to worsen the BOP. However this result is consistent with some of the empirical

literature (Boateng & Ayentimi, 2013; Adamu & Itsede, 2010; Batool, Memood & Jadoon, 2015; Mavi & Sharma, 2014; Eita & Gaomab, 2012).

Money supply (M2GDP) is negatively and significantly related to BOP. An increase in money supply causes the domestic currency to depreciate if money supply exceeds demand. Depreciation of currency implies imports are relatively more expensive, hence cause the BOP to deteriorate. Theory also suggests that an increase in money supply will cause the interest rates to fall. This results in the reduction of capital inflows which worsen the BOP. These results are consistent with evidence by Ajayi (2014); Gureech (2014); Oladipupo & Onotaniyohuwo (2011).

Exchange rates have a negative and significant effect on BOP, which result was expected. The depreciation of the exchange rate will cause exports to become relatively cheaper and imports relatively expensive. By implication since the Marshall Lerner index does not hold in the long run for most developing countries, a depreciation of the exchange rate will worsen the BOP (Kennedy, 2013; Chiawa, Asare & Dauran, 2013; Mavi & Sharma, 2014; Oladipupo & Onotaniyohuwo, 2011; Chowdhury, 2013).

Consumer Price Index (CPI), as a measure of inflation, has a positive but statistically insignificant impact on BOP. This is contrary to most empirical findings which indicate a negative and significant relationship between inflation and BOP (Mavi & Sharma, 2014; Chiawa, Asare & Dauran, 2013). Inflation results in a depreciation of the exchange rate which makes imports more expensive and exports cheaper and in situations where the Marshall-Lerner condition does not hold the resultant effect would be a worsening of the BOP. Foreign direct investment has a negative but statistically insignificant impact on BOP in Botswana.

5. CONCLUSION

This study examined the determinants of balance of payments in Botswana using annual data from 1980 to 2014 and the error correction model (ECM). The results showed that the balance of payments in Botswana are positively and significantly influenced by balance of trade, real gross domestic product, but negatively and significantly influenced money supply and real exchange rates. From the policy perspective, selective use of monetary policy instruments by the Government of Botswana is critical to maintain stable balance of payments.

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