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Analysis of Tax Performance in Botswana: *Tax Effort Index Approach*

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BOTSWANA INSTITUTE FOR DEVELOPMENT POLICY ANALYSIS

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ABSTRACT

This study estimates the impacts of different economic sectors and other determinants on tax revenue in Botswana using Two Stage Least Squares (TSLS) estimation procedure and quarterly data for the period 1994/95 (1)-2013/14 (4). The study further assesses whether Botswana has been using its average taxable capacity to an optimal level using a Tax Effort Index (TEI) approach. The results obtained suggest that the elasticities of tax revenue with respect to mining sector, trade sector, manufacturing sector, GDP per capita and outstanding debt are positive, while that with respect to total grants is negative. However, the agricultural sector has had no impact on tax revenue collections. Therefore, policies aimed at expanding economic sectors which are positively related to tax revenue would lead to increased tax collections. Another approach for increasing tax collection is to capacitate tax collectors, so as to improve their skills and necessary infrastructure for tax collection.

1.0 INTRODUCTION

The prudent management of revenue from the mining sector, particularly diamonds, since independence in 1966 has transformed Botswana from an agricultural-based to a resource-based economy. Available evidence indicates that the mining sector is core to Botswana economic development. For example, during the period 1990/91-2013/14, the contribution of mining to Gross Domestic Product (GDP) was estimated at an average of 22% per year. During the same period, mining accounted for almost 56% of total tax revenue (Bank of Botswana, 2015), indicating that mining has been the leading source of government revenue.

However, the dependency of the tax system on the mining sector has been seen as a fiscal threat to Botswana since it has been projected that diamond deposits would be depleted by the year 2050 (Grynberg et al., 2015). Consequently, tax revenues would be drained, making it difficult for the government to finance its budget expenditure. The government is therefore under tremendous pressure to identify alternative tax sources that can have a significant contribution to tax performance and growth during the post diamond era. Finding alternative revenue sources would reduce dependency on mineral tax revenue and yield a sustainable tax system beyond the diamond era, in turn enabling the government to continue financing the delivery of public goods and social services to promote employment creation, poverty reduction and economic diversification.

A sustainable tax system is integral to supporting the delivery of public goods and services. When the level of tax revenue is low relative to government expenditure, government effort to invest in the provision of public goods and social services is constrained (Davoodi and Grigorian, 2007). Thus, inadequate tax revenue collection would discourage investment in human capital and infrastructure development and would consequently constrain sustainable economic growth (Stotsky and WoldeMarian, 1997). Inadequate tax revenue maybe brought about by inappropriate tax legislation that limits increases in tax collection (Tanzi, 1968; Sotsky and WoldeMarian, 1997).

This paper assesses the contribution of different sectors of the economy on tax revenue, to further identify sectors that have had a significant contribution to tax revenue growth. The study is important for Botswana because the government is committed to restructuring and diversifying its tax base, to reduce heavy reliance on revenue from the mining sector. The study therefore, estimates the determinants of tax revenue and constructs a tax effort index. It extends the work done by Botlhole (2011), whose main focus was to assess the impact of institutional quality on tax revenue collection, using different economic sectors as control variables. The study differs from the work done by Botlhole (2011) in that it considers the tax effort index (TEI) to further assess whether Botswana has used its average taxable capacity to an optimal level. The study also employs recent data to that of Botlhole (2011).

The rest of the paper is organized as follows. Section 2 provides a brief overview of the tax system and tax performance in Botswana, while Section 3 provides a brief review of the literature on the estimation of tax performance. Section 4 outlines methods of analysis and data, while section 5 discusses empirical findings. Finally, Section 6 covers conclusions and policy implications.

2.0 TAX SYSTEM IN BOTSWANA

Botswana's economy and its fiscal policy are highly dependent on the mining sector, particularly diamond mining royalties, dividends and taxes. Despite the high dependency on mineral revenues, the impressive fiscal policies the government adopted have allowed the country to maintain budget surpluses and low ratios of public debt to GDP by international standards. For example, during the period 2005/06-2006/07, the budget balance improved significantly and reached a surplus of 8.4% of GDP (Bank of Botswana, 2015). This was due to the increase in tax revenue collection, coupled with significant cuts in total expenditure, as well as improved tax implementation and conformity. Figure 1 reveals that during the period from 1989/90 to 2013/14, both total revenue and total expenditure trended upward. On the other hand, the budget balance exhibited an upward trend from 1989/90 to 2006/07, a downward trend from 2006/07 to 2009/10, and an upward trend between 2009/10 and 2013/14.

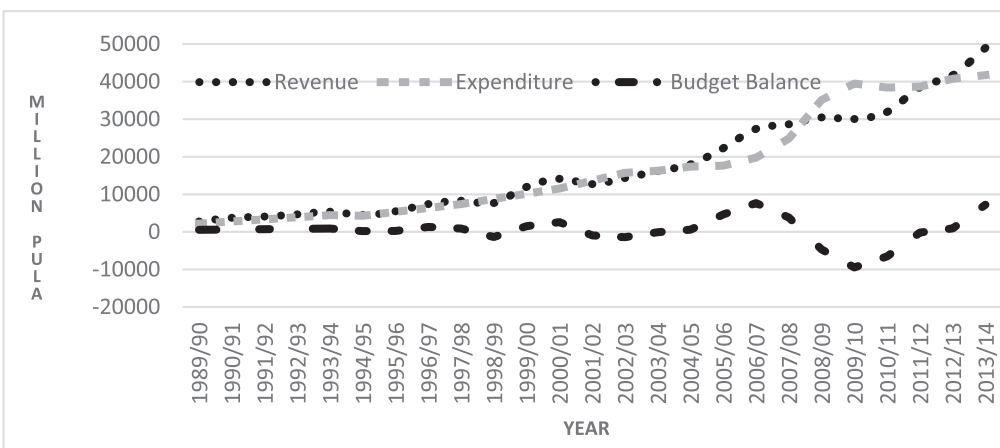

Figure 1: Budget Balance
Source: Bank of Botswana

Figure 2, which depicts the structure of Botswana's tax system, indicates that the mining sector has accounted for a larger fraction of tax revenue. On average, 56% of total tax revenue was from the mining sector during the period 1989/90-2013/14. During the same period, custom and exercise accounted for 22%, income tax for 13% and value added tax (VAT) for 8% of total tax revenue. However, the share of mining to total tax revenue has declined over the last decade; from 70% in 1995/96 to 42% in 2013/14.

Despite such decline, minerals have remained a dominant source of tax revenue. On the other hand, the share of custom and exercise to total tax revenue has grown over time; from 17% in 1995/96 to 37% in 2011/12. However, by 2012/13, it had fallen to 30%. Therefore, the gap between the mining and custom and exercise tax revenue has significantly narrowed during the period 1995/96-2013/14, indicating the increasing importance of custom and exercise tax as a source of government revenue.

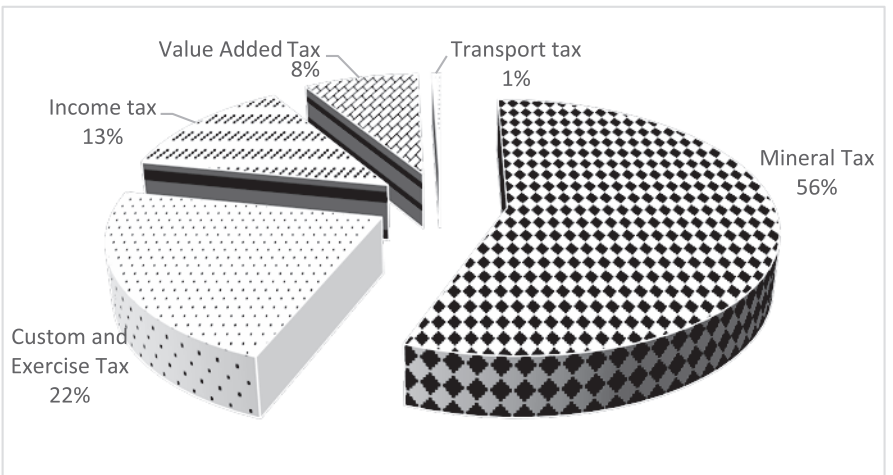

Figure 2: Average Shares of Major Tax Sources to Total Tax, 1989/90-2013/14
Source: Bank of Botswana

Income tax, comprising of cooperate and personal income tax, has also registered significant improvement in terms of contribution to total tax revenue; it increased from 7.4% in 1995/96 to 17% in 2013/14. VAT on consumption of goods and services, also experienced a significant increase over the last decade, brought by the increased consumption of goods and services and the introduction of 2% increment of the VAT rate in 2010. VAT share to total tax revenue increased from 4.8% in 1995/96 to 11% in 2013/14.

3.0 BRIEF REVIEW OF LITERATURE

3.1 RESOURCE DEPENDENT COUNTRIES AND TAX COLLECTION

The optimality of the taxation system should consider enhancement in all sectors of the economy that have the potential to influence increases in tax collection. This is important for promoting attainment of efficient and sustainable tax system that will continuously support budget expenditure. However, it has been argued that some resource-dependent countries are reluctant to mobilize domestic resources in other sectors of the economy, and hence, their tax systems are sorely dependent on extractive industries. This is common among resource-dependent countries such as Iran, Botswana, Saudi Arabia,

United Arab Emirates, Algeria, Qatar, Angola, Kuwait, and Venezuela (Bornhorst et al., 2009; Botlhole, 2011; Rabiei and Balagetabi, 2013).

Tax authorities in resource-dependent countries tend to neglect the fact that depending sorely on natural resources is a fiscal threat to sustainable economic development since such natural resources will be exhausted sometime in the future. From a policy standpoint, such countries are encouraged to take a significant step to mobilize domestic resources from other sectors of the economy which have the potential to contribute to increases in tax revenue collection. A more plausible approach would be to promote diversification into sectors with growth potential as a way to increase tax collection from such secto rs.

Most oil-dependent Arab countries, such as Algeria, Lebanon, Oman, Saudi Arabia, Kuwait, Qatar and United Arab Emirates, have faced difficulties to collect enough tax revenue from other economic sectors to finance human and infrastructure investment (Eltony, 2002). Despite the programs embarked on to increase tax collections in these countries, the shares of tax revenue to GDP have remained relatively low due to the limited number of tax sources. However, improvements in tax collection have recently been observed in some countries, pointing to better prospects for those countries which are still struggling to increase their tax collections (Eltony, 2002).

Tax collection effort has also been analyzed in Sub-Saharan Africa countries that are heavily dependent on mineral and oil reserves. Thomas and Trevino (2013) indicated that large fractions of tax revenue in countries such as Equatorial Guinea, Republic of Congo, Angola, Nigeria, Chad, Gabon, Botswana, Cameroon, Democratic Republic of Congo, and Guinea come from extractive industries. On average, in these countries, the ratio of tax revenue from extractive industries to total tax revenue exceeded 20% between 2005 and 2010. During the same period, the shares of tax revenue from extractive sectors to total tax revenue were around 90% for Equatorial Guinea, 80% for Republic of Congo, 76% for Angola and Nigeria, 73% for Chad, 58% for Gabon, 36% for Botswana, 30% for Cameroon, 26% for Democratic Republic of Congo, and 22% for Guinea (Thomas and Trevino, 2013). Therefore, there is need to improve tax collection in other sectors of the economy, given that natural resources are subject to depletion and exhaustion.

Tax systems in OPEC countries have also depended heavily on one sector (oil production) due to the limited diversification of their economies. The OPEC countries appear to have also generally neglected the fact that natural resources are subject to depletion and exhaustion. Existing tax systems have deprived OPEC countries the opportunity to mobilize domestic resources and have limited their ability to deliver social and welfare programs to the public (Rabiei and Balagetabi, 2013). Therefore, such countries have been encouraged to consider structural changes so as to promote growth in other economic sectors and broaden their tax bases.

3.2 DETERMINANTS OF TAX REVENUE

A number of studies have estimated the determinants of tax revenue in both developing and developed countries (Bornhorst et al., 2009; La Porta et al., 1999; Mehlum et al., 2004; Clague et al., 1999; Edwards, 1998; Leuthold, 1991). Most studies have indicated that improvements in economic development cause the public to demand more public services and infrastructure that various countries have adopted, and increasing tax collections is an approach for financing increased demand from public services (Bahl, 1971; Agbeyegbe et al., 2004). Empirical studies have assumed that GDP growth reflects economic development, which in turn is understood to lead to increased ability to collect more tax. However, others have argued that GDP per capita is a better measure of economic development since it takes population into account (Elbadawi, 1999; Burgess and Stern, 1993), and therefore, increases in per capita GDP would lead to improved tax performance.

Botlhole (2011) estimated the ratio of tax-to-GDP as a function of natural resource rent, institutional quality, GDP per capita, the interaction term between institutional quality and natural resource rent, ratio of external aid-to-GDP, ratio of agriculture-to-GDP, ratio of trade-to-GDP, ratio of manufacturing-to-GDP, and ratio of informal economy-to-GDP. The results indicated that natural resource rent impacted tax revenue negatively, while quality of institutions, GDP per capita and the interaction term between quality of institutions and natural resource rent were positively related with tax revenue. This implies that the quality of institutions is integral to improving performance of tax collections in natural resource rich countries. The study further revealed that the share of the agriculture, manufacturing, informal sector and foreign aid to GDP were negatively related with tax-to-GDP ratio, while the share of trade openness to GDP was positively related with tax-to-GDP ratio.

Botlhole and Agiobenebo (2006) conducted a study on the determinants of tax elasticity and buoyancy of tax revenue in Botswana using quarterly time series data for the period 1982-2001. They estimated tax-to-GDP ratio as a function of the trade-to-GDP ratio, ratio of tax arrears-to-tax, SACU revenue-to-tax revenue ratio, non-mining output-to-GDP ratio, and a dummy for capturing the effects of discretional changes in tax rates. Their findings revealed, trade openness, regional integration (SACU revenues) and economic diversification (non-mining GDP) were positively related with tax-to-GDP ratio, while tax evasion was negatively related with tax-to-GDP ratio. The study recommended the government of Botswana to consider structural shift in the economy through diversification in order to expand its tax base as well as avoiding tax evasion as a means of promoting tax performance.

4.0 METHODS OF ANALYSIS AND DATA

4.1 MODEL SPECIFICATION

The empirical model for estimating the impact of defferent economic sectors and other determinants on tax revenue was specified as:

$$\log(TR_t / Y_t) = \beta_0 + \beta_1 \log(Ypc_t) + \beta_2 \log(Agr_t / Y_t) + \beta_3 \log(Min_t / Y_t) + \beta_4 \log(Mnf_t / Y_t) + \beta_5 \log(Trd_t / Y_t) + \beta_6 \log(Grnt_t / Y_t) + \beta_7 \log(Debt_t / Y_t) + \mu_t$$

where TR is real tax revenue, Y denotes real GDP, Ypc represents real GDP per capita, Agr is real agricultural GDP, Min denotes real mining GDP, Mnf is real manufacturing GDP, Trd is the sum of real exports and imports, $Grnt$ represents real grants received, $Debt$ is real national debt, $\beta's$ are parameters to be estimated, μ is an error term (assumed to be distributed with zero mean and constant variance), t denotes quarter and log is the natural logarithm.

GDP per capita measures the level of the country's economic development. Its rise is expected to lead to increased demand for public goods and services, further having a positive impact on tax revenue. Taxes collected from the agricultural sector are expected to have a positive influence on tax revenue. However, governments in most developing countries find it hard to collect such taxes, particularly direct taxes on the rural farming population and small farmers, due to the need for agricultural subsidies and lobbying (Ahmed and Mohammed, 2010). Therefore, the growth of the agricultural sector may not necessarily translate into increased tax collections. Taxes collected from the manufacturing sector (sales tax, excise duty, cooperate and income tax) are expected to contribute to tax revenue growth. Therefore, manufacturing sector growth is expected to positively influence tax revenue.

According to Martinez-Vazquez (2001), taxes collected from the mining sector (mineral tax, royalties, dividends and capital gains) are expected to contribute significantly to an increase in tax revenue collections. This would be highly expected in the case of Botswana since government revenue has been heavily dependent on the mining sector. Therefore, the mining sector variable is expected to carry a positive sign. Taxes imposed on exports and imports of tradable goods (tariffs, and custom and excise duties) are expected to contribute positively to tax revenue collections. This is also because trade taxes are easier to administer and collect (Martinez-Vazquez, 2001; Linn and Weitzel, 1990). Therefore, a positive coefficient is expected for the total trade variable.

Countries which have experienced high levels of budget deficits are often required to borrow in order to meet their budget expenditures (Ahmed and Mohammed, 2010). If a

country experiences increased accumulation of debt, it is normally tempted to increase its level of tax collections, implying that debt is expected to positively influence tax revenue. The inflow of grants or aid from foreign donors makes the recipient country reluctant to utilize its taxable capacity, and hence impacting negatively on tax revenue (Ahmed and Mohammed, 2010; Remmer, 2004; Leuthold et al., 1991). Therefore, the coefficient for the grants variable is expected to be negative.

4.2 MEASURING TAX EFFORT INDEX

4.2.1 METHOD 1

Tax Effort Index (TEI) is an approach used to evaluate the maximum amount of tax a particular country could reasonably collect at a given point in time given its economic characteristics. In other words, it assesses whether a particular country is making enough efforts to optimize its taxable capacity. The main advantage of this approach is that it gives more insight into the average amount of tax that could have been collected if taxable capacity was exploited to an optimal level (Sobarzo, 2004).

Following Sobarzo (2004), we estimated TEI as follows:

Step 1: Calculate effective tax rate (ϕ^e) as:

$$\phi_t^e = \frac{TR_t}{Y_t} \qquad 0 < \phi^e < 1 \tag{2}$$

where *TR* represents actual tax revenue, *Y* is Gross Domestic Product (representing a reasonable or direct indicator of tax base), and t represents time (or period).

Step 2: Calculate average effective tax rate $\tilde{\phi}^e$ as:

$$\tilde{\phi}^e = \left(\sum_{t=1}^{n} \phi_t^e \right) / N \tag{3}$$

where N is the total number of time periods.

Step 3: Calculate potential tax *PT* as follows:

$$PT_t = \tilde{\phi}^e * Y_t \tag{4}$$

where *PT* represents the maximum amount of tax revenue that could be collected when taxable capacity is utilized to an average degree.

Step 4: Calculate TEI as:

$$TEI_t = \frac{TR_t}{PT_t} \tag{5}$$

If TEI = 1, it would imply that actual tax revenue is similar to potential tax revenue. However, TEI < 1 would imply that the country is under-utilizing its taxable capacity. Further, TEI > 1 would imply that the country is collecting more taxes than its taxable capacity. Equation 5 is however not a perfect measure of tax effort since it relies on average tax collections to measure tax effectiveness. We used annual data for the period from 1994/95 to 2013/14 to compute TEI following the four steps outlined above.

4.2.2 METHOD 2

Several studies have constructed TEI using regression coefficients from standard OLS or panel data estimation procedures (Begum, 2007; Eltony, 2002; Davoodi and Grigorian, 2007; Teera and Hudson, 2004; Begum, 2007; Stotsky and WoldeMarian, 1997; Piancastelli, 2011). Following this approach, we used equation 1 estimates to compute TEI. First, we computed the share of potential tax revenue to GDP as:

$$\widetilde{\phi}_t^e = \exp(PV_t) = \frac{\widetilde{TR}_t}{Y_t} \tag{6}$$

where PV denotes the predicted value of equation 1.

Next, we computed TEI as:

$$TEI_t = \frac{\left(TR_t / Y_t\right)}{\left(\widetilde{TR}_t / Y_t\right)} = \phi_t^e / \widetilde{\phi}_t^e \tag{7}$$

where the numerator represents actual tax revenue and the denominator denotes potential tax revenue. Note that equation 7 is equivalent to the ratio of actual tax revenue to potential tax revenue.

TEI could be less or more than 1, depending on whether actual tax collections are less or more than potential tax collections. As before, TEI = 1 if actual tax is equals to potential tax collections, and TEI < 1 if taxable capacity is underutilized. On the other hand, TEI > 1 would indicate use of taxable capacity to an optimal level (Mkandawire, 2011; Piancastelli, 2011; Begum, 2007). Most of the literature has used this traditional regression approach to measure TEI based on estimates of standard ordinary least squares and panel data techniques. Potential tax is measured as an average level of tax revenue that could be achieved rather than the true maximum level that could be achieved if

taxable capacity is fully optimized. According to Langford and Ohlenburg (2015), this should be distinguished from stochastic frontier analysis which estimates the maximum potential tax revenue for a given set of explanatory variables, which would be a better measure of potential tax revenue.

4.4 DATA AND ESTIMATION PROCEDURE

Before selecting an appropriate estimation procedure, we conducted the Hausman test to determine if GDP per capita is not endogenous. First we estimated GDP per capita as a function of the remaining explanatory variables and instrumental variable (proportion of population with access to sanitation). Following, Brun and Diakite (2016), the proportion of population with access to sanitation was used as a proxy for GDP per capita. The reason for using access to sanitation is that the production of goods and services in the economy depends on productivity of the workforce, and for the workforce to be productive it needs to be in good health conditions. Therefore, access to sanitation would enable the health of the workforce to be in good conditions, which positively increase productivity, and further increases economic growth. Increased economic growth would lead to expansion in the taxable capacity and increased tax collections (Brun and Diakite, 2016).

Then, the resulting residuals were used as one of the regressors in the structural form equation (equation 1). If the coefficient for residuals is statistically significant, this would imply that GDP per capita is endogenous, and that OLS is not consistent. However, if the coefficient for residuals is not statistically significant, this would imply that GDP per capita is exogenous, and OLS is consistent. In the presence of endogeneity, TSLS would be a suitable model estimation procedure.

Based on the results of this test, equation 1 was estimated using the 2SLS estimation procedure with quarterly time series data for the period 1994/95 (1)-2013/14 (4). The data on GDP from the different sectors of the economy (mining, agriculture, manufacturing and trade) as well as total GDP and GDP per capita were obtained from Statistics Botswana (2015). Data on tax revenue, grants and national debt were collected from Bank of Botswana (2015).

5.0 RESULTS AND DISCUSSION

5.1 ENDOGENEITY TEST RESULTS

Table 1 shows endogeneity test statistics evaluated using Hausman test. As seen, the coefficient for the residuals is statistically significant at 10 % level, implying that there is evidence that GDP per capita is endogenous. Therefore, 2SLS would be one of the most appropriate estimation procedure.

Table 1: Hausman test (Instrument Specification Test)

Test Statistics	Value	Probability	Adj. R-Sqrd
Difference in J-Statistics	4.256	0.084	0.629
Restricted J-Statistics	3.156		
Variable	Coefficient	T-Statistics	P-Values
Constant	68.76	7.687	0.002
GDP Per Capita	0.71	5.21	0.000
Mineral Sector	0.68	2.34	0.008
Manufacturing Sector	0.35	4.65	0.000
Agricultural Sector	-0.24	-1.24	0.143
Trade Sector	0.42	2.18	0.009
Outstanding Debt	0.07	3.82	0.016
Total Grants	-0.14	-2.26	0.000
Residuals	4.82	1.39	0.076

5.2 ESTIMATION RESULTS

Since the Hausman test shows that the null hypothesis is rejected at 10 %, this suggests weak evidence of endogeneity. Therefore, it is important to compare estimates of Ordinary Least Squares (OLS) and Two Stage Least Squares (TSLS). Table 2 reports both TSLS and OLS estimates of equation 1. Most of the estimated coefficients for TSLS model are statistically significant, except for the agriculture sector coefficient which is marginally insignificant. In addition, all the estimated coefficients for the TSLS model yielded theoretically expected signs. Coefficient for the OLS model also carry theoretically expected signs, and most of them are statistical significant, except for agricultural sector and outstanding debt.

Table 2: Estimated Results

	TSLS		OLS	
Variable/Statistical Measures	Coefficient	P-Values	Coefficient	P-Value
GDP Per Capita	0.76	0.000***	0.87	0.000***
Mineral Sector	0.69	0.008***	0.75	0.008***
Manufacturing Sector	0.38	0.000***	0.49	0.006***
Agricultural Sector	-0.25	0.103	-0.24	0.112
Trade Sector	0.47	0.009***	0.69	0.068**
Outstanding Debt	0.10	0.016**	0.11	0.109
Total Grants	-0.13	0.000***	-0.31	0.000***
Constant	2.14	0.239	2.05	0.139
R-Squared	0.76		0.62	
Adjusted R-Squared	0.70		0.58	
F-Statistics	56.53 (0.0000)		16.97 (0.0000)	

Note: ***, **, and * indicate significant at 1%, 5% and 10% level of significance, respectively.

The interpretation of estimated coefficients will only focus on the 2SLS. The elasticity with respect to the mining sector (0.69) is relatively high, suggesting that Botswana tax revenue collections have dependent heavily on the performance of the mining sector. This elasticity is only surpassed by that for GDP per capita (0.76). The elasticity with respect to real GDP per capita suggests that as the level of economic development increases, the public would demand increased provision of public goods and services, further prompting fiscal authorities to increase the level of tax revenue collection to meet the increased demand.

The elasticity with respect to the trade sector is third (0.47), suggesting that the trade sector is contributing significantly to tax revenue collections in Botswana after the mining sector. Therefore, the relative expansion of tradable goods would result in an increase in the amount of trade taxes collected (VAT, custom and exercise duties) which would translate into increased tax revenue. The elasticity with respect to the manufacturing sector (0.38) comes fourth in terms of its relative contribution to tax revenue performance. Therefore, the expansion of the manufacturing sector would result in an increase in the amount of tax collected (sales tax, cooperate and income tax), further leading to an increase in total tax revenue.

The agricultural sector has a negative but statistically insignificant (although marginally insignificant) impact on tax revenue collection. This suggests that growth of the agricultural sector does not affect tax revenue collection due possibly to the inability to

tax the rural farming populations. Grants carry a negative and statistically significant coefficient, indicating a negative impact on tax revenue collection. This indicates that increased reliance on aid from foreign donors to support budget expenditures would increase the country's reluctance to collect enough taxes or to mobilize domestic resources. The positive influence of national outstanding debt on tax revenue indicates that the accumulation of debt would motivate tax authorities to increase tax revenue collection in order to avoid borrowing and accumulation of more debt.

5.3 TAX EFFORT INDEX

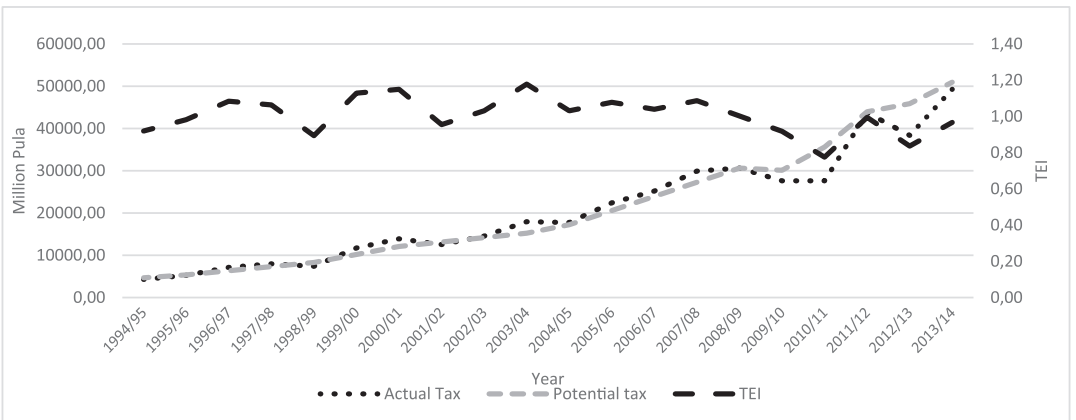

Figure 3: Actual Tax, Potential Tax (Million Pula) and Tax Effort Index

Note: Primary Axis-Actual and Potential Tax, Secondary Axis-Tax Effort Index

Method 1 used equations 2-5 to calculate TEI estimates. Figure 3 depict annual estimates of actual and potential tax (in million pula) on the primary axis and TEI on the secondary axis for the period 1994/95-2013/14. As seen, actual tax revenue almost matched potential tax revenue. From 2008/09 to 2013/14, potential tax started to deviates from actual tax. This could have been induced by global financial crisis, which caused a significant fall in mineral exports and revenue, and hence mineral tax.

Method 2 used estimates of equation 1 to compute TEI. Figure 4 compares actual tax revenue with potential tax revenue on primary axis and the constructed TEI on secondary axis for the period 1994/95 (1)-2013/14 (4).

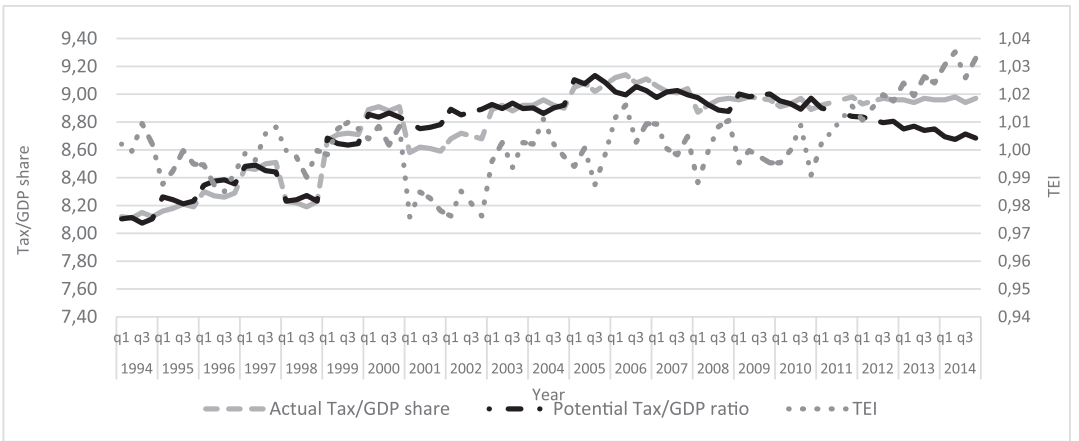

Figure 4: Actual, Predicted Tax to GDP share and Tax Effort Index

Note: Primary Axis-Predicted and Actual Tax-GDP share, Secondary Axis-Tax Effort Index

As seen, the amount of actual tax collected in Botswana was similar to potential tax revenue. The average estimated TEI (1.003) suggests that the amount of actual tax collected matched potential tax revenue during the period under review. During the period from 1994/95 to 2001/02, TEI trended downward. It then exhibited an upward trend from 2001/02 to 2006/07. However, since 2008/09 potential tax has been above actual tax collected, suggesting that taxable capacity was not being utilized to an optimum level. Again, this could have been induced by significant fall in mineral exports and tax revenue caused by global financial crisis because Botswana's tax revenue is heavily dependent on the mineral tax.

In sum, TEI estimated in this study were similar to those obtained by Mkandawire (2010) and Teera (2002), which were recorded at 1.11 and 1.27, respectively. Since Mkandawire (2010) used data for the period 1984-2004 and Teera (2002) used data for the period 1975-1998, current estimates suggest that TEI in Botswana has declined.

6.0 CONCLUSION AND POLICY IMPLICATIONS

This study estimates the determinants of tax revenue using quarterly time series data from 1994/95 to 2013/14. One of the objectives was to identify economic sectors that have the potential to raise tax revenue collections. We also assessed if Botswana has used its average taxable capacity to an optimal level using tax effort index approach. The results obtained suggest that the elasticities of tax revenue with respect to mineral sector, trade sector, manufacturing sector, GDP per capita and outstanding debt are positive, while that with respect to total grants is negative. However, the agricultural sector has had no impact on tax revenue collections.

Economic sectors which are positively related to tax revenue are very important for restructuring Botswana's tax system. Therefore, policies aimed at expanding these sectors would lead to increased tax collections. The other key element to strengthen tax collection is to encourage the public's commitment to pay taxes. But as a starting point, the public needs to be educated more on why it is important to pay taxes, and also be informed on the kind of services they benefit from as a results of paying taxes. Another key element for increasing tax collection is to capacitate tax collectors, so as to improve their skills and necessary infrastructure for tax collection.

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