Assessing The Relationship Between Taxation Policies and Economic Growth: A Case Study of Botswana 2008-2019

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Abstract - The efficacy of fiscal policy in determining economic growth and development can be assumed to be determined by tax administration, tax policies, tax efficiency, and tax levels. Using quarterly data, this study investigates the relationship between Botswana's tax system and economic growth between January 2008 and December 2019. Multivariate regression analysis was used to investigate the relationship between various forms of taxation and Botswana GDP on a quarterly basis from January 2008 to December 2019. The research employed a multivariate regression model with Botswana's GDP as the dependent variable while explanatory variables were; income tax (Ytax), customs tax (custax), minerals tax (min tax), export tax (xtax), property tax (protax), vehicle tax (vehtax), license tax (Litax), and VAT (Vtax). Findings revealed a weak positive relationship between all forms of taxation and Botswana's GDP. These findings indicate that the Botswana government provides a wide range of services, including health, education, security and defense, social services, and many others. The government heavily subsidizes food and transportation. Thus, citizens in Botswana trust their government to provide basic necessities of life. The study's findings indicate that all forms of taxation in Botswana have a weak positive relationship with GDP. As a result, direct links between taxpayers and the government should be strengthened. In this regard, it means that tax payers should be given opportunities to express their views on how they perceive the benefits of the funds they contribute to their economy through taxation. Basing on coefficient estimates, lowering the corporate tax rate by ten percentage points can raise the real annual per capita growth rate by 1.1 to 1.8 percentage points. Given an adjusted R^2 of 0.89 and a statistical probability of less than 0.05 at the 5% level of test, it appears that a strong relationship exists between GDP and various forms of taxation. Tax policies, efficiency, and administration all point to a shaky relationship between economic growth and tax systems. As a result, Botswana's fiscal policies are regarded as a poor economic policy for boosting economic growth.

Keywords: economic growth, *GDP*, taxation, income tax, customs tax, minerals tax, export tax, property tax, vehicle tax, license tax, and VAT

1.0 Introduction and Background

Poverty, income inequality, and a lack of growth have posed significant challenges for Africa and many developing countries. Domestic resource mobilization makes more room in the budget for long-term expenditures, fosters ownership, and reduces reliance on external assistance. Botswana and many other southern African countries have been fostering major economic paradigms to boost economic growth and development for over a half-century. According to economic theory and evidence, international trade and trade policy measures, fiscal policy, price policy, and monetary policies, as well as a variety of other major thrusts, have all been used to boost Botswana's economic growth and development. With Covid-19, high poverty, a

lack of trade, and other political and international challenges, Botswana is focusing on domestic fiscal policy to stimulate economic growth and development.

Literature suggests that mobilizing domestic resources creates additional space for sustainable budget expenditures, reduces foreign dependency on international financial institutions, and increases ownership. Zimbabwe, Zambia, and other African countries are currently depicted in various forms of social media as having been recolonized by China. When assessing revenue sources, the Botswana government considers not only volume, but also content, fairness of tax policies, and credible and locally based sources. Economic arguments suggest that less developed countries need to strengthen their domestic resource bases in order to improve infrastructure development. Resources mobilization takes into account how much is realized, how it was realized, and a variety of other factors that promote domestic independence and growth.

In accordance with the National Development Plan and Vision 2036, Botswana must improve its infrastructure development in areas such as transportation, power generation, water supply, health infrastructure, and education, among others. All of these strategic reasons necessitate Botswana increasing its domestic resource mobilization. According to Riba (2016), who cited Helms (1985), who studied the effect of taxes on economic growth, tax increases support economic growth at the state and local levels when tax revenues are used by governments to finance improved public services rather than transfer payments? Public services provided by the government through taxation are essential for the survival of all businesses, as every business and labor require roads, water, security, and defense, among other things, all of which can be funded by tax revenues.

Helms, on the other hand, proposed a negative relationship between taxation and economic growth when taxes are used for transfer payments. Botswana, like the United Kingdom, views social welfare as critical to the country's long-term prosperity and growth. Domestic revenue is spent heavily on education, health and medical care, infrastructure development, and care for the elderly and orphans. This implies that tax resources may be diverted from productive assets, thereby undermining economic growth and development.

According to Dackehag and Hansson (2012), corporate and personal income taxation affect entrepreneurial activities and can boost economic growth. According to Dackehag and Hansson, such a relationship is not clear in different countries. Theory and evidence suggest different outcomes. For example, Bakija and Narasimhan (2015) argue that taxes can distort decision making, cause resource misallocation, and result in deadweight loss to the economy. This implies that Botswana's tax policy and administration are critical for efficient resource allocation, mobilization, fostering entrepreneurship, and enhancing economic growth and development.

Bandura and Dzingirai (2019) contended that tax consequences are determined by how entrepreneurial income is taxed in each country. High personal income tax rates encourage individuals to become entrepreneurs (self-employed) in order to avoid highly taxed personal income in countries where entrepreneurial income is taxed at a lower rate than personal income. This implies that taxes have varying effects on economic growth depending on how the tax systems are implemented and what is deemed appropriate in a given country. Each country's policy must be evaluated on its own merits, with particular attention paid to how such policies affect the national resource base.

2.0 Methodology

A simple linear regression model was constructed to explain the relationship between taxes and economic growth in Botswana using various forms of taxes such as income tax (Ytax), customs and exercise duty (custax), mineral taxes (mintax), export duty (xtax), property tax (protax), vehicle tax (vehtax), license fees (lictax), and value added tax (vtax). This research makes use of quarterly data from January 2008 to December 2019. The study adopted a model by Gashi, Asillan and Boqolli (2018) as follows: $GDP = \alpha + \beta 1Ytax + \beta 2Custax + \beta 3Min tax + \beta 4Protax + \beta 5Xtax + \beta 6Vehtax + \beta 7Litax + \beta 8Vtax + \epsilon i$

Where GDP = Gross Domestic product, Custax = Customs and Excise duty, Min tax = Minerals tax, Xtax= Export tax, Protax = property tax, Vehtax = Vehicles tax, Litax = License tax and Vtax being value added tax.

Diagnostic tests, such as stationarity tests or unit root tests (Augmented Dickey-Fuller test), are used to determine whether time series data is stationary. To test multicollinearity, the pair wise correlation matrix was used. The multivariate Johansen test was used to determine whether or not the variables in this model have a

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long run relationship. The Granger causality test was used to determine how various forms of taxation cause or affect GDP, as well as how GDP affects various forms of taxation. The Breusch-Pagan-Godfrey test was used to test for heteroscedasticity, and the P values of the chi-square were greater than 0.05, indicating that the data is not heteroscedasticity and are homoscedastic, and thus pass the test of classical linear regression that the data passes.

3.0 Findings

This study investigates how Botswana's tax reforms, levels, and systems have aided economic growth and development. GDP is explained using eight types of taxes: mineral tax, export duty, import duty, license fees, vehicle license, income tax, property tax, and VAT.

Correlation matrix: Multicollinearity test

Basing on Kennedy (2008), correlation analysis was undertaken to ascertain whether explanatory variables do not show serial relationships. The researcher employed the pair-wise correlation matrix for this test.

	GDP	Custax	Imptax	Ytax	Litax	Protax	Mintax	Vatax	Vehtax
GDP	1.000000	0.306781	0.834287	0.769752	0.548461	0.749174	0.694865	0.583774	0.659711
EXPDU	0.306781	1.000000	0.352332	0.095077	0.016923	0.307190	0.276506	0.060984	0.057210
INCT	0.769752	0.095077	0.681803	1.000000	0.415423	0.620469	0.590440	0.723084	0.587244
LICF	0.548461	0.016923	0.346652	0.415423	1.000000	0.444528	0.268110	0.010782	0.565699
ROT	0.749174	0.307190	0.633731	0.620469	0.444528	1.000000	0.675402	0.372506	0.413768
MINR	0.694865	0.276506	0.539100	0.590440	0.268110	0.675402	1.000000	0.503556	0.441770
VAT	0.583774	0.060984	0.479510	0.723084	0.010782	0.372506	0.503556	1.000000	0.373489
VEHT	0.659711	0.057210	0.484230	0.587244	0.565699	0.413768	0.441770	0.373489	1.000000

Source: Author's calculation (2020).

The ADF test was used to determine whether or not the data has a unit root. As a result, it was used to determine whether the data has a long run relationship, as shown in Table II, where GDP and mineral taxes were stationary at the level and all other variables were stationary after first differential.

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Table II: Augmented Dickey -Fuller: Stationarity/Unit Root Tests

Source: Author's compilation (2020).

Table III Cointegration Test: Angle Granger Approach

Null Hypothesis: D(RESIDUAL) has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

			t-Statistic	Prob.*					
Augmented Dickey-Fuller	test statistic		-9.879504	0.0000					
Test critical values:	1% level		-2.616203						
	5% level		-1.948140	-1.948140					
	10% level		-1.612320						
*MacKinnon (1996) one-sided p-values.									
Augmented Dickey-Fuller	Test Equation								
Dependent Variable: D(RE	SIDUAL,2)								
Method: Least Squares									
Included observations: 46 after adjustments									
Variable	Coefficient	Std. Error	t-Statistic	Prob.					
D(RESIDUAL(-1))	-1.371257	0.138798	-9.879504	0.0000					

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R-squared	0.684428	Mean dependent var	-0.004148				
Adjusted R-square	ed 0.684428	S.D. dependent var	0.618486				
S.E. of regression	0.347439	Akaike info criterion	0.745047				
Durbin-Watson sta	at 2.118085						

ADF statistics of 9.879504 are greater than 1.948140 at 5%, 2.616203 at 1%, and 1.612320 at 10%, according to the ADF test. This demonstrates that the error term is stationary and that the model's variables have a long run relationship. As a result, the variables have long run co-integration, and estimation of the equation is meaningful in the long run.

The Breusch-Pagan-Godfrey test was used to assess heteroscedasticity in this model. The data were discovered to be homoscedastic.

TABLE IV: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.179291	Prob. F(7,40)	0.3363
Obs*R-squared	8.211406	Prob. Chi-Square(7)	0.3143
Scaled explained SS	3.644357	Prob. Chi-Square(7)	0.8197

Variable	Coefficient	Std. Error	t-Statistic	Prob.
С	-0.001283	0.007006	-0.183114	0.8556
Custax	0.000236	0.000468	0.504109	0.6170
Ytax	-0.002372	0.001013	-2.342228	0.0242
Litax	0.000119	0.000259	0.459907	0.6481
Protax	-3.19E-05	0.000790	-0.040392	0.9680
Mintax	0.000343	0.000781	0.439374	0.6628
Vatax	0.002117	0.001179	1.796102	0.0800
Vehtax	-0.000102	0.000700	-0.145902	0.8847
R-squared	0.171071	Mean dependent	var	0.000433
Adjusted R-squared	0.026008	S.D. dependent var		0.000495

0.000488

9.53E-06

Schwarz criterion

Akaike info criterion

-12.26089

-11.94902

S.E. of regression

Sum squared resid

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I og likelihood	302 2613	Hannan Quinn criter	12 1/203					
	502.2015		-12.14303					
F-statistic	1.179291	Durbin-Watson stat	2.103952					
Prob(F-statistic)	0.336288							

Source: Own computation

According to the study, when testing for heteroscedasticity, it was assumed that variables should have constant variance in accordance with classical linear models (homoscedastic).

The null hypothesis is: Variables have inconsistency in their variance.

Variables have constant variance, according to the alternative hypothesis.

As shown in Table IV, a P-value of Chi2 of 0.8197 is greater than 0.05, implying that the null hypothesis is rejected and that the variables are homoscedastic, implying that the model is valid.

The Breusch-Godfrey Serial Correlation LM test results show that the data does not have serial correlation because the p-value of the f-statistic is greater than 0.05, and thus the alternative hypothesis is rejected.

Table V: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.832730	Prob. F(1,39)	0.1004
Obs*R-squared	3.250350	Prob. Chi-Square(1)	0.0714

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 05/10/20 Time: 17:34

Sample: 1 48

Included observations: 48

Presample missing value lagged residuals set to zero.

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Variable	Co	efficient	Std. Error	t-Statistic	Prob.
С	0.1	61171	0.333884	0.482717	0.6320
Custax	-0.	006502	0.021708	-0.299539	0.7661
Ytax	0.0	08468	0.046504	0.182094	0.8565
Litax	-0.0	002043	0.011881	-0.171981	0.8643
Protax		21915	0.038333	0.571715	0.5708
Mintax		029596	0.039744	-0.744659	0.4609
Vatax		006411	0.053949	-0.118837	0.9060
Vehtax	-0.	000254	0.031969	-0.007949	0.9937
RESID(-1)	0.3	06573	0.182151	1.683072	0.1004
R-squared	0.0	67716	Mean dependent	var	-4.85E-16
Adjusted R-square	ed -0.	123522	S.D. dependent v	var	0.021027
S.E. of regression	0.0	22288	Akaike info crite	rion	-4.602202
Sum squared resid		19373	Schwarz criterion	n	-4.251352
Log likelihood	119	9.4529	Hannan-Quinn ci	riter.	-4.469615
F-statistic	0.3	54091	Durbin-Watson s	stat	2.050351
Prob(F-statistic)	0.9	38095			

This study employed the Jacque- Bera test to test for normality. The hypothesis for this test is as follows: Null hypothesis: Residuals are normally distributed Alternative: Residuals are not normally distributed ISSN: 2704-4777 Diverse Journal of Multidisciplinary Research (DJMR) Volume 5, Issue 2, June 2023



Fig 4.1 Normality

As indicated by Fig 4.1 above, the histogram and probability show that the Jarque-Bera shows that the residuals are normally distributed with a p-value of 0.452803 is higher than 0.05.

Descriptive Statistics

	GDP	Ytax	Litax	Mintax	Protax	Vatax	Vehtax	Custax
Mean	10.30558	9.283471	7.065080	9.565838	7.063287	9.121991	7.795109	5.601821
Median	10.32389	9.290102	6.916454	9.596011	7.096910	9.085297	7.796574	5.612784
Maximum	10.41709	9.511282	8.131939	9.809156	7.290035	9.380211	8.169380	5.903090
Minimum	10.17155	9.061498	6.643453	9.211281	6.808211	8.905148	7.478566	5.176091
Std. Dev.	0.064710	0.141215	0.403544	0.136499	0.143225	0.103937	0.143615	0.164069
Skewness	-0.248225	0.048553	1.909491	-0.359267	-0.636018	0.635294	0.467295	-0.883955
Kurtosis	1.939758	1.827950	5.006690	2.464843	2.143957	2.809153	3.617166	4.047817
Jarque-Bera	2.741150	2.766263	37.22287	1.605367	4.701768	3.301632	2.508707	8.446847
Probability	0.253961	0.250792	0.000000	0.448125	0.095285	0.191893	0.285260	0.014648
Sum	494.6679	445.6066	339.1239	459.1602	339.0378	437.8556	374.1652	268.8874
Sum Sq.	0.10/007	0.027050	7 (520 47	0.075700	0.064125	0.507726	0.060201	1 0 (5101
Dev.	0.196807	0.937252	/.653847	0.8/5/02	0.964135	0.507736	0.969391	1.265181
Observations	48	48	48	48	48	48	48	48

Source: Author's computation (2020).

This study used multivariate regression analysis computed using the standard ordinary least square formula to investigate the quarterly relationship between various forms of taxation and Botswana GDP from January 2008 to December 2019. As a result, the study used Botswana's (GDP) as the dependent variable, as well as

some selected tax variables, such as income tax (Ytax), customs tax (custax), minerals tax (min tax), export tax (xtax), property tax (protax), vehicle tax (vehtax), license tax (Litax), and VAT (Vtax). The multivariate regression model was then created in equation 1:

$GDP = \alpha + \beta 1Ytax + \beta 2Custax + \beta 3Min tax + \beta 4Protax + \beta 5Xtax + \beta 6Vehtax + \beta 7Litax + \beta 8Vtax + \epsilon i$

GDP = 5.879345 + 0.24180Y tax + 0.056794 Min tax + 0.064070 X tax + 0.073173 Protax + 0.056145 Vehtax + 0.024481 Litax + 0.017175 V tax

This equation demonstrates a weak positive relationship between all types of taxes and Botswana's GDP. It could be argued that the Botswana government provides essential services such as health, education, security, defense, and social services, among others. The government provides substantial subsidies for food and transportation. As a result, citizens in Botswana believe that the government can provide the necessities of life. The government has a role in determining the country's course.

In conclusion, this study finds a positive relationship between customs tax and GDP in Botswana. With a coefficient of 0.06070, this relationship is extremely weak. The most important factor is how tax revenue is used to spur economic growth. This study discovered a positive relationship between income tax (Ytax) and GDP. These findings indicate a weak positive relationship with a coefficient of 0.241280 and a P- value of 0.0000.

Using Kosovo's GDP, Gashi, Asllani, and Boqolli (2018) conclude that taxes on profits, taxes on individual businesses, VAT, taxation of monthly statements, collection of resources, and payment of taxes on interest, dividends, property rights, rentals, lottery and gambling winnings, and corporation tax have a positive impact on GDP.

Stoilova (2017), Dowrick (1992), Dackehag and Hansson (2012) all discovered comparable results. Arnold, et al. (2011) discovered, using 21 countries over 34 years, that a percentage point increase in income taxes' share of total tax results in lower economic growth of 0.25 to 1%. When corporate and personal income taxes are separated, Dackehag and Hansson (2012) discovered that increases in corporate taxes reduce GDP growth more than increases in personal income taxes. As a result, a weak relationship demonstrates that income tax supplements other sources of revenue while also assisting economic growth and development. According to this viewpoint, it can have both a positive and negative relationship. This implies that a positive relationship demonstrates that the Botswana government uses its resources to promote entrepreneurship, build infrastructure, and stimulate growth. The collected revenue can be reinvested back into the economy to stimulate growth.

The study discovered that in Botswana, there is a weak positive relationship between license fees and GDP, with license fee revenue being insufficient to cover collection and management costs. The revenue generated is regarded as administrative rather than productive. The study suggests raising license fees in order to make a significant contribution to the economy. A weak positive relationship between mineral tax (mintax) and GDP was discovered in Botswana, and a similar result was discovered in Kosovo. Mineral revenue in the form of royalties has benefited and accelerated growth in Botswana, indicating a positive relationship between mineral taxation and economic growth.

In Botswana, the study discovered a weak positive relationship between property tax (protax) and GDP, with other studies supporting the conclusion that an increase in property tax can result in an increase in GDP. The study also discovered a weak positive relationship between VAT (vatax) and GDP in Botswana, contradicting the widely held belief that high consumption taxes harm economic growth. However, Botswana's vehicle tax is considered too low to have a significant impact on growth and is only intended for cost recovery. In comparison to other authors, the study provides evidence about the relationship between taxes and economic growth in Botswana. Gale, Krupkin, and Rueben (2015), for example, discovered a positive relationship between property taxes and economic growth. Similarly, the study compares its findings on mineral taxes and GDP to those of Gashi, Asllani, and Boqolli (2018), who found that mineral taxes have a positive impact on economic growth in Kosovo.

The study, on the other hand, discusses Arnold, et al's (2011) contention that high consumption taxes, such as VAT, can have a negative impact on economic growth by influencing labor-leisure trade-off choices. The

study, on the other hand, discovered a weak positive relationship between VAT and GDP in Botswana, which contradicts Arnold's theory.

Using empirical literature and data analysis from previous studies, the study investigated tax administration and tax efficiency in Botswana. It came to the conclusion that tax efficiency and administration are critical for stimulating economic growth, and that broadening the tax base can result in increased revenue collection. The effective use of tax revenue can serve as a growth incentive. The study also cited Gashi, Asllani, and Boqolli's (2018) finding that high tax rates can be distortive and have a negative impact on economic growth. Lowering tax rates, increasing the tax basis, reducing tax exemptions, and constructing tax structures can all help economic growth.

According to the study, tax levels in Botswana are high in relation to income levels, and taxation in general has a weak positive relationship with GDP. These findings are consistent with the literature, which shows that the relationship between taxation and economic growth can be bidirectional, depending on the level of taxation and how collected funds are used.

4.0 **Recommendations**

The study concludes that tax efficiency levels and leadership have an impact on tax revenue collection in Botswana, resulting in potential revenue loss. Tax administration efficiency and transparency should be improved to increase revenue mobilization. Not only do strengthening tax systems increase revenue, but it also promotes good governance and accountability. As a result, direct links between taxpayers and the government should be strengthened.

In this regard, it means that tax payers should be given opportunities to communicate about how they perceive their benefits from the funds they contribute to their economy, as well as giving citizens the right to request audit, reporting, and transparency in resource utilization and benefits. According to the coefficient estimates, lowering the corporate tax rate by ten percentage points can raise the real annual per capita growth rate by 1.1 to 1.8 percentage points. From 1970 to 1997, the United States' annual growth rate was around 1.5%. As a result, a tax structure that favors organization and taxes corporate profits less will stimulate economic growth. Botswana's government should consider tax reform in order to broaden the tax base and increase government revenue.

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