



THE CAUSE AND EFFECT RELATIONSHIP OF VALUE ADDED TAX (VAT) AND GROSS DOMESTIC PRODUCT IN TANZANIA MAIN LAND

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ABSTRACT: *The objective of this study was to assess the cause and effect relationship of value added tax (VAT) and Real gross domestic product (RGDP) in Tanzania. The study adopted quantitative descriptive design. This study used only secondary data collected from Tanzania Revenue Authority (TRA) from the year 2000 to 2021 and National Bureau of statistics (NBS). The time series data gathered were tested for stationarity and analyzed quantitatively through ordinary least square method by using Stata 14 statistical software. The findings indicated VAT [$R^2 = 0.9867$, $\ln(RGDP) = 12.21854 + 0.4133458 \ln(VAT)$] significantly and positively contribute to country's GDP. A number of recommendations were made from this study, Tanzania should intensify its efforts to collect VAT by providing more education to taxpayers, and improve consistency administration of VAT collection using EFD. It was also recommended TRA to enhance usage of electronic tax filing system in order to improve service delivery and foster accountability by closing off opportunities for revenue leakage and improve voluntary compliance. It was further recommended Policy makers in Tanzania to look on possibilities of reducing VAT rate to 16% so as to reduce distortion on social welfare.*

KEYWORDS: Value Added Tax, Gross Domestic Product.



INTRODUCTION AND BACKGROUND

Countries all over the world striving to look for ways to boost their revenue. This has prompted many nations to undertake various reforms in their tax systems. In Tanzania, for example, it has necessitated reforms of several taxes including the Value Added Tax (VAT). The reform focused on the concerns resulted from the structure and implementation of the VAT policy. Fjeldstad et al (2018), in their study, the customer is king: Evidence on VAT compliance in Tanzania they argued that numerous exemptions and zero-rated goods and services complicated the underlying VAT structure, caused complexity in the tax system and added to widespread leakages through the many opportunities for abuse and avoidance. They also concluded an adverse effect on revenue generation. VAT is not only a tool to mobilize government revenue but also a tax technology that involves new process, equipment and skills to implement. VAT is now regarded as key source of tax revenue in many countries including Tanzania (Dasanayake,2021).

Among the newly introduced taxes in the 1990s was value added tax on goods and services (VAT). In Africa, for instance, VAT has been introduced in Benin Republic, Cote d'Ivoire, Guinea, Kenya, Madagascar, Mauritius, Senegal, Togo, Nigeria and Tanzania (Adereti, Adesina & Sanni, 2011). Value added tax (VAT) is a consumption tax, levied at each stage of the consumption chain and borne by the final consumer of the product or service. The administration of VAT is relatively easy, unselective and difficult to evade.

VAT is the largest source of government revenue charged on supplies of goods and services in Tanzania mainland and importation of taxable goods and services in the country. It was introduced in 1998 at standard rate of 20% and 0% over the years the VAT rate was changed to 18% and zero percent rates. This decrease of rates was primarily intended to improve administration and enhance voluntary compliance rather than to resolve any tax burden distribution issues.

In July 2015, the Value Added Tax Act (1997) was replaced by the Value Added Tax Act (2014), with the main objectives being removal of the long list of non-standard exempted items and to be more in line with international accepted best practice in angle of Value added tax. The new VAT Act maintained schedules for zero rated items and few exempted items.

In introduction of 2014 Value Added Tax Act which is termed as second phase of VAT reforms, government improve efficiency of VAT systems through making of VAT system friendlier to small enterprises by introducing opt in clauses for voluntary registration applicants for VAT while raising the VAT entry threshold and by adopting risk based compliance management system.

Sustainable economic growth is a primary goal of taxation policy in Tanzania. In the current era, where many countries are grappling with economic challenges, there has been a notable shift towards relying on Value Added Tax (VAT) as a solution to financing the increasing fiscal deficits. K.K. Dewett and M.H. Navalur (1986), in their book titled modern economic theory they hypothesize that indirect taxes like VAT play a crucial role in developing economies. This is due to the high levels of poverty, which result in low yields from direct taxes, such as income tax. Consequently, there is a growing reliance on indirect taxes.

Studies on the contribution of VAT to country's real Gross Domestic Product produced conflicting results, some studies, such as those by Ristic et al. (2019) and Odu et al. (2022),



suggest that VAT is essential for promoting economic growth and achieving macroeconomic goals. Oghuma (2017) conducted a study in Nigeria, mainly focused on the value added tax and economic growth. In his study he employed time series survey covering a lapse period of twenty years (1994-2015). He employed simple linear ordinary least square (OLS) regression as statistical tools for analysis. The study found that VAT is significantly and positively contributed towards economic growth.

However, other researches, including study by Salim (2020), Chindengwike (2022), and Eze et al. (2020), indicates a negative impact of VAT on economic growth, in their analysis they suggested that, value added tax distort tax payer's consumption power and ultimately lead to country's production decline. VAT and Income Tax contribute two third of all the tax revenue collected in Tanzania (Semboja and Msafiri, 2022). With reference to previous scholar's divergent findings and given the fact that VAT being one of the major sources of government tax revenue in Tanzania, there is a need to establish the causality of VAT on gross domestic product of the country.

RESEARCH METHODOLOGY

Research Philosophy

The researcher applied positivism philosophy that lead to collection of quantitative data for statistical analysis and interpretation. Positivists believe that the essence of human behavior and society is objective and can be scientifically measured. This study emphasizes on objective assessments using statistical and numerical analysis.

Research Design

The research adopted deductive reasoning since it is useful for achieving the study's objectives. The data used in this study were secondary and mostly quantitative that calls for statistical measurement. The study established a cause-and-effect relationship between the independent and dependent variables. Further current study used longitudinal research strategy since the data collected is time series in nature covering a period of twenty-two (22) years from 2000 to 2021.

Source of data and Data Collection Methods

This research made extensive use of secondary data. Data was collected through documentary review. The data was obtained from the National tax statistics published every year by The Tanzania Revenue Authority and the National Bureau of Statistics. The GDP and VAT data collected covered a period of twenty-two years from the year 2000 to 2021.

Model Specification

The linear regression model (OLS) was employed by author followed the pattern of a simple linear regression analysis. The model was operationalized on total VAT tax serving as an independent variable and GDP as the dependent variable of this study. The functional relationships denoting effect of Total VAT tax to GDP. Model of estimation is presented as follows



$$Y_i = \alpha_0 + \alpha_1 X_1 + \mu \dots \dots \dots (i)$$

Y_i: Represent the dependent variable which is real GDP.

α₀: Represent a constant factor of the intercept;

α₁: Represent the coefficient of independent variable;

X₁: Represents an independent variable Total VAT.

μ: Represent an error terms

The analysis anchored on time-series regression models that expresses relationship between Total VAT tax and real GDP of Tanzania mainland over 22 years in an annual time series data set. The dataset was subjected to natural logarithmic (ln) transformations, making the models to be specified in log-log equations. Which create error correction model (ECM).

$$\ln(\text{RGDP}) = \alpha_0 + \alpha_1 \ln(\text{Total VAT}) + \mu \dots \dots \dots (ii)$$

Description of variable in equation two

The dependent variable constitutes gross domestic product (GDP) while total VAT represent (VAT on domestic and VAT on import) as independent variable.

Where

$\ln(\text{RGDP})$ = Natural logarithms of Gross Domestic Product.

$\ln(\text{Total VAT})$ = Natural logarithms of total VAT.

Reliability of data

Cronbach's alpha was used to test the reliability coefficient, which calculates internal consistency by examining how each test item relates to each other and to the entire test., where “ $> .9$ – Excellent, $> .8$ – Good, $> .7$ – Acceptable, $> .6$ – Questionable, $> .5$ – Poor, and $< .5$ – Unacceptable”. Cronbach's alpha reliability coefficient, given as a value between 0 and 1, was employed in this study. The scale's items may be internally consistent when Cronbach's alpha is close to 1.0.

Validity

The validity of the scale was tested in this study based on content validity analysis, which refers to the relevance of the measuring approach or instrument to the construct being measured, which was performed through the use of expert opinion.



RESULTS AND DISCUSSION

Analytical Test

Prior to conducting regression analysis, the study employed analytical tests to verify that data being used for analysis are reliable and suitable to be used thus ensure healthier result.

Reliability statistics

The study applied Cronbach's Alpha coefficient to test the ability of the instrument of the study to give the desired results. Results from the table below reveals Cronbach's alpha coefficient of 0.8463 which is above 0.7, therefore, here it can be concluded that there is internal consistency in the data set and the data is reliable.

Table 1: Results from Cronbach's Alpha test

Description of item	Results
Observation in all pairs	22
Test scale	Mean (Standardized item)
Number of item in the scale	2
Scale reliability coefficient	0.8463

Source: Researcher (2023)

Stationary test

This is a test for stationarity of the variables. It was conducted to see whether the constructing process of time series model is stationary or non-stationary. This test assumes that with time series data good results occur when the series is stationary otherwise using non stationary data would lead to false regression problems which might lead to biased and unreliable results.

The unit root tests were employed to determine the properties of the variables for the period under study 2000-2021. The ADF unit root test was used to examine the presence of unit root. Table 3.2 is the output of the estimates.

Table 2: Unit Root Tests

Variables	ADF		
	t-statistic	Prob	Order
Real GDP	2.419	0.9990	I(1)
TOTAL VAT	0.301	0.9774	I(1)

Source: Author (2024)

From Table 2, the output of the unit root tests using the Augmented Dickey-Fuller (ADF) show that all the variables were stationary at the first difference I (1). To correct this, natural logarithms was introduced as way to smooth data, eliminate outliers from the data distribution and eliminate effect of trend, cyclical, seasonality and random. After applying natural logarithms, the data became safe from non-stationarity effects.



Descriptive Statistics

This section presents summary data related to the study's variables of interest; that is, the mean, standard deviation, minimum and maximum values, as well as the normality of all the variables utilized in the study. Summary statistics provide a quick overview of how the variables of interest behave:

```
. tsset YEAR, yearly
      time variable: YEAR, 2000 to 2021
      delta: 1 year
```

Table3: Summary Statistics

```
. summarize DVATVATi RGDP LnDVATVATi LnRGD
```

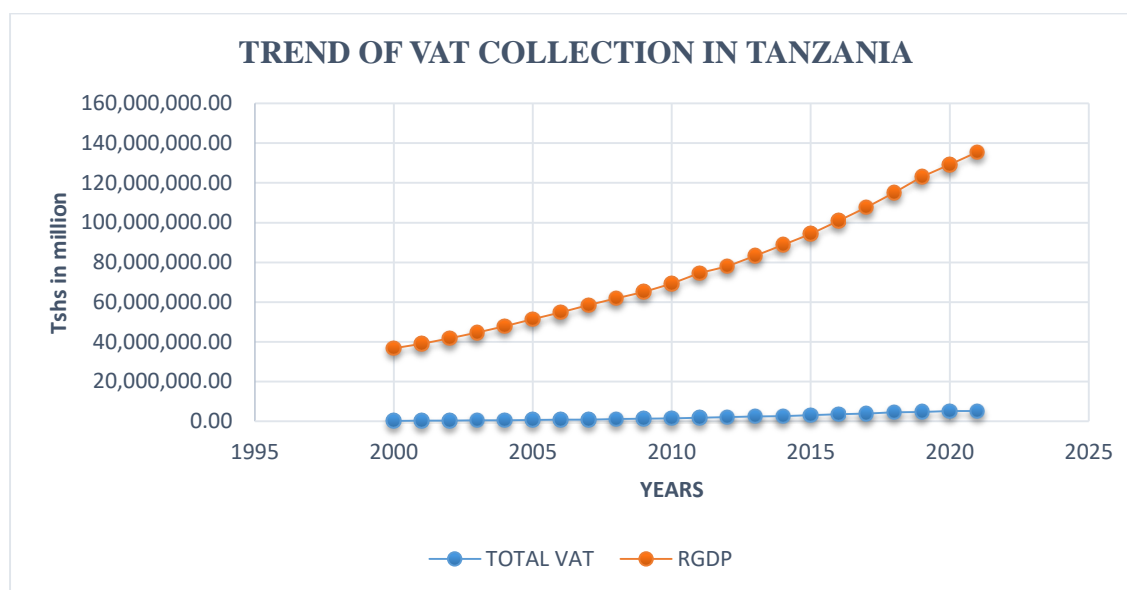
Variable	Obs	Mean	Std. Dev.	Min	Max
DVATVATi	22	2151114	1700223	236280	5217889
RGDP	22	7.74e+07	3.07e+07	3.68e+07	1.36e+08
LnDVATVATi	22	14.19771	.9743912	12.37277	15.4676
LnRGD	22	18.0871	.4054758	17.42064	18.72461

Source: Researcher (2024)

Trend of VAT Collection

Figure1 below depicts the trend of VAT collection in Tanzania mainland for the period under study. The results show an increasing trend with regards to the collection of VAT in Tanzania. The results are in line with the study done by (Nguvava, et.al 2023) on the assessment of the performance of VAT in Tanzania. The study revealed

Figure 1: Trend of VAT collection in Tanzania



Source: Author (2024)

A notable growth in VAT collections registered in 2016/17 because of effective management in applying EFDs, the enforcement of the 2014 VAT law and delays in settling VAT refunds to allow for the audits of refund claims by 100 percent. The decision to audit the refund claims was based on the realisation of the presence of innumerable applications that did not qualify for payment and, thus, a drop in the tax refunds eligible for payment by 90.14 percent.

Contribution of VAT to Revenue Collection

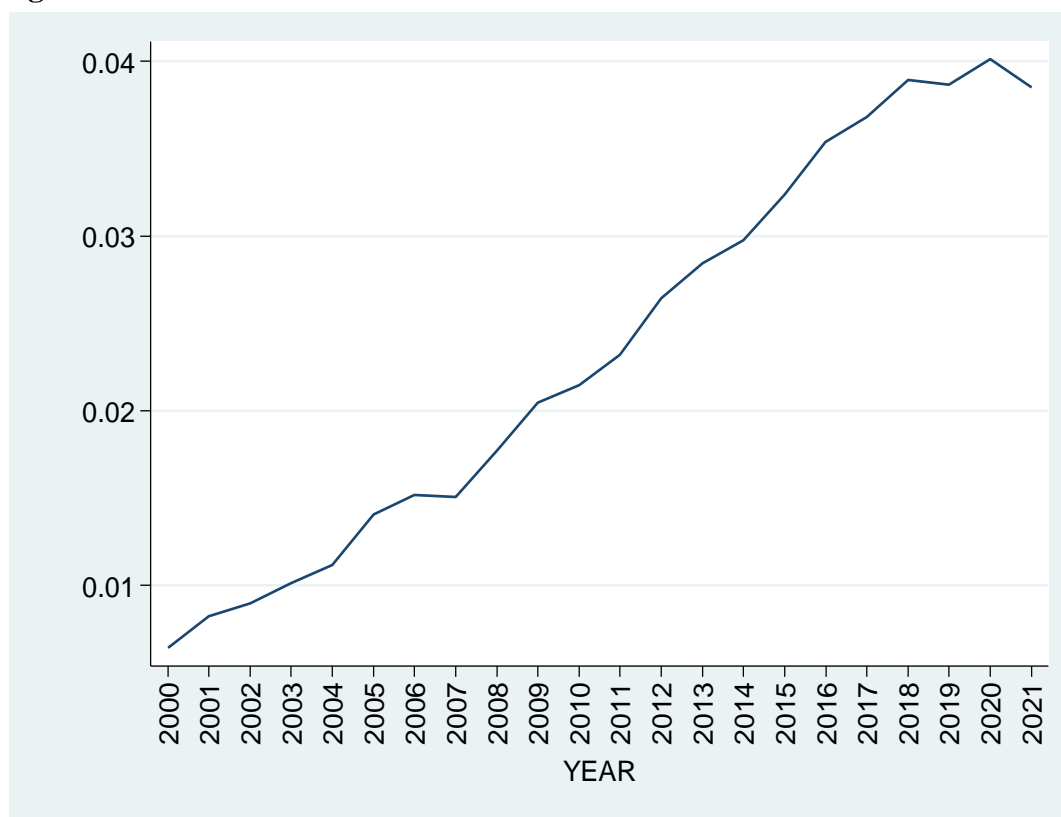
VAT has been a vital source of tax revenue for the government coffers since its inception in 1998. Records from 2010/11 to 2019/20 show that this tax has contributed on average 27 percent of all tax revenue each year because of compliance with VAT attributable to the enforcement of new VAT act of 2014 that had dropped some of the exemptions. Also, the VAT registration threshold rose from 20 million, 40 million, 100 million and now 200 million. Additionally, throughout the period under review the percentage of VAT relative to the total revenue collection had produced a mixed trend over years. A higher rate emerged in 2004 when VAT contributed to 44 percent of the total revenue collection as Figure 2 below illustrates:

**Figure 1: VAT Contribution to total Revenue Collection in Percentage**

Source: Author (2024)

VAT Collection to GDP

During the period under review, VAT contributions to GDP yield a mixed pattern. The ratio of VAT to GDP collections averaged 3.25 percent each year as Figure 3 illustrates. However, the VAT and GDP ratio in the period 2010/11 to 2019/20 shows a rather reduced ratio of VAT collections from imported goods to GDP of only 1.7 percent whereas the ratio for domestic goods and services stood at 1.9 percent. This picture suggests that Tanzania still largely rely on VAT for imported goods.

**Figure 3: VAT Contribution to GDP in Percentage**

Source: Author (2024)

Regression analysis

In most cases time series data are not static and thus produce erroneous results when used for regression analysis, in order to reduce the effects of trends, seasonality, cycles and irregular variations in time series data collected over long run, natural logarithms (ln) was introduced in the data set.

Regression analysis was employed to establish the causality between dependent variable (Real GDP) and the independent variable total VAT. The study conducted simple linear regression analysis so as to be able to estimate and predict the mean value (expectation) for the dependent variable real GDP in given value of explanatory variable (VAT). The findings were as shown in the table below;

**Table 4: Regression Results**

```
. regress LnRGD LnDVATVATi
```

Source	SS	df	MS	Number of obs	=	22
Model	3.40653698	1	3.40653698	F(1, 20)	=	1478.32
Residual	.046086463	20	.002304323	Prob > F	=	0.0000
Total	3.45262344	21	.16441064	R-squared	=	0.9867
				Adj R-squared	=	0.9860
				Root MSE	=	.048

LnRGD	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
LnDVATVATi	.4133458	.0107505	38.45	0.000	.3909207 .435771
_cons	12.21854	.1529752	79.87	0.000	11.89944 12.53764

Source: Author (2024)

The table 4 above shows analysis of variance and coefficient of determination. From the analysis it was found that independent variable (VAT) has strong relationship with real GDP as explained by R-square of 0.9867. Coefficient of determination explains the percentage of variation in the dependent variable (Real GDP) that is explained by the independent variables or extent to which changes in the dependent variable can be explained by the change in the independent variables.

The study further conducted an Analysis of Variance to check on the significance of the Model. From the ANOVA results, the probability value of 0.000 was obtained in the model which indicates that the simple regression model was significant in predicting the relationship between real GDP and the predictor variable. From these results, the linear regression equation can be drawn as $\ln(\text{RGDP}) = 12.21854 + 0.4133458\ln(\text{VAT})$. This imply that by keeping total VAT collection constant the average change of real GDP is 12.21854 and the average unit change of total VAT in real GDP is positive increase of 0.4133458. This simply mean that VAT collection contribute much to real GDP.

These findings complement the findings by Oghuma (2017), in his study mainly focused on the value added tax and economic growth, he employed time series data covering a period of twenty years (1994-2015). He employed simple linear ordinary least square (OLS) regression as statistical tools for analysis. The study found that VAT is significantly, suggesting that VAT has positive relationship with Real GDP as suggested by this study.

Findings from the regression analysis shows the coefficient of VAT is positive 0.4133458 implying an increase in VAT collection lead to increase in gross domestic product. The estimated results on the contribution of Value added tax on economic growth revealed that VAT has a significant effect on the economic growth of Tanzania. These results are in agreement with the study on effect of taxation on economic growth by Maganya (2020), Adayemi (2023) and Eze et al (2020), findings from their study indicated that, the rate of economic growth has positive reflections on increase in the efficiency of VAT collections. They further recommended that the highest efficiency of VAT collection is possible if fiscal policy measures correlated with economic and structural policies and have a strong synergetic



effect. This study has also revealed that VAT has significant positive contribution on economic growth in Tanzania.

CONCLUSION

This study assessed the causality of value added tax on the gross domestic product in Tanzania Mainland. The independent variable VAT comprise of both import and domestic VAT collection. While the dependent variable was economic growth measured through real gross domestic product. The study covered period of 22 years. The data collected were analysed using simple linear regression analysis. Findings from this study have revealed a significant positive long run relationship between VAT and economic growth of Tanzania. This implies an effective administration of VAT through use of technology will contribute significantly to economic growth in the long run in Tanzania. Therefore, VAT continues to function as powerful components of total tax revenue and tool for economic growth and development. This study indicated that both VAT on importation and domestic VAT should be well administered as they are greatly connected to economic growth.

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