An Empirical Analysis of Value Added Tax on Economic Growth, Evidence from Kenya Data Set

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Author’s contribution
The sole author designed, analysed, interpreted and prepared the manuscript.

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ABSTRACT
The study is aimed at empirically analyzing the effect of value added tax /sales tax on economic growth in Kenya for the period 1973 to 2010. The study adopted econometric exposition based on its ability to determine the strength and direction of relationships between variables. The ordinary least square technique was used to estimate the model. The empirical result indicates that a positive and insignificant relationship exist between value added tax and economic growth in Kenya. A positive and insignificant correlation between VAT Revenue and GDP means there are some problems inhibiting its potency. The study concluded that the effect of value added tax on the economy is not large enough to influence the economic growth. It therefore recommended that the government should reform VAT system to engineer a system that would have a significant impact on economic growth.

Keywords: Value added tax; economic growth; Kenya.

1. INTRODUCTION
Tax revenue mobilization as a source of financing developmental activities has been a difficult issue primarily because of various forms of resistance, such as evasion, avoidance and other corrupt practices that can easily be perpetuated within the direct taxes bracket [1].

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The role of direct taxation in developing countries is much more limited. In contrast to developed countries where taxation on personal income and social security contributions raise two thirds of the total tax revenue, a narrow tax base and high enforcement costs render direct taxation impractical for developing countries. The solution appears to be in broad-based indirect taxes like value-added tax (VAT) that has the potential of diversifying the revenue portfolio for the country to promote fiscal sustainability and economic growth [2].

Value Added Tax (VAT) is multi-stage consumption tax that is applied to the sale of goods and services at all stages of production and distribution chain [3]. The foundation of VAT can be traced as far back as writing of a German businessman, Wilhelm Von Siemens, who anticipated it as an alternative for new established German turnover tax in 1918. The first modern VAT was invented by French Economist Maurice Faure, on 10th April 1954 as taxe sur la valeur Adjoutee (TVA in French), although it must be noted that the tax only applied up to wholesale level [4].

Nowadays there is a global shift in paradigm, where focus point in moving from direct taxation policy towards indirect tax policy. The introduction of VAT has been globally associated with significant more tax revenue collected, even though the impact is modest in terms of size [5], relying more on VAT than income tax decreases real cost of evasion activities [5]. This tax has been adopted in replacement of sales taxes and according to its definition; the key advantage is that revenue is secured by being collected through production decision unlike a turnover tax [6]. However [7] emphasize, the VAT collection efficiency remains largely dependent on, the quality of enforcement and efficiency of monitoring which both increase with political stability and ease of political participation.

The widespread use of VAT began with introduction into the European Union (E.U). VAT was adopted by all E.U countries in an effort towards tax harmonization to set the foundation for European free trade zone [8]. Since 1980’s countries of the world had undergone tax reform due to two world wide trend that affected developed and developing countries alike, the first trend was economic liberation and adherence to world trade organization (WTO) requirement, which called for elimination of all barriers to free trade and the other was rapidly increasing popularity of VAT all over the world. VAT has tended to spread in regional burst, in countries participating in IMF programmes and in countries with low tax revenue performance in the past [5]. The International Monetary Fund (IMF) underline the growing importance and expansion of value added tax as follows: The value added tax has become a key source of government revenue in over 120 countries, about 4 billion people, 70 per cent of the world population now lives in countries with VAT and it raises about 18 trillion dollars in tax revenue, roughly one – quarter of all government revenue [9].

This wind of change in taxation did not leave Africa behind. It appears that in Africa, the Francophone countries were front liners is the imposition of VAT. This is due to early introduction of VAT in France, and with its policy of assimilation and association, it was not difficult to impose on its colonies in Africa to follow suit. The VAT was introduced in Kenya in January 1990 by enactment of VAT act (cap 476) Laws of Kenya to replace sales tax which has been in operation since 1973. The shift was motivated by the argument that VAT had a higher revenue potential and its collection and administration were more economical, efficient and expedient [10]. VAT has become a cornerstone in Kenya’s tax and economic system, it is more than just an additional revenue source, it is the largest single source of tax revenues. VAT was perceived as the tax of the future in line with the country’s objective of reducing reliance on direct taxes as well as diminishing the role of trade taxes [11]. Despite the enormous revenue that flows into the government treasury, there are critics who argue that the incidence of VAT like other consumption taxes are highly regressive, the reason is that poor people spend a large portion of their income on purchases some of which carry VAT.

The tax is charged on the supply of taxable goods and services made in Kenya and on importation of taxable goods and services in Kenya. Registered persons acting as agents who then submit to KRA collect VAT at designated points [12]. The commissioner of domestic taxes is mandated to assess, collect and account for taxes. Under the VAT act, there are three different classes of goods and services; designated, zero-rated and exempt goods and services. Success and amount of revenue generated under VAT eventually depends upon the household income and upon the tax being regressive to the least possible extent. Kenya’s
The consistency in existing empirics and the matter for developing countries are relatively few. The inconsistency in existing empirics and the wide knowledge gap occasioned by the paucity of empirical literature on Kenya has made this issue open for further research in the country. The aim of this paper is not to resolve the raging debate but to add to the value added tax-growth literature by examining the contribution of value added tax on economic growth in Kenya.

2. REVIEW OF THEORETICAL AND EMPIRICAL LITERATURE

The theoretical foundation of this study revolves around the endogenous growth model. The endogenous growth model introduced by Barro [13]. Barro and Sala-i-Martin [14] claimed that the causality running from fiscal policy to economic growth has both negative and positive effects. The theoretical literature on fiscal policy predicts that non-distortionary taxes will have a positive effect on long term growth whereas distortionary taxation will have a negative effect. One of the main rationales for taxing consumption rather than income is that it exempt savings and capital income from tax base and hence it boost household savings and thereby leading to more capital formation and higher economic growth [15]. The extensive literature on comprehensive tax reform generally recommended a fiscal regime with significant reliance on consumption based taxation like value added tax, which results in more savings investment and higher growth rate than under a tax regime more heavily weighted towards income taxation.

Michael and Ben [16] explored the causes and consequences of the spread of value added tax (VAT). A panel study of 143 countries for 25 years were observed. The result showed that VAT has a significant but mixed impact on economic growth and total tax revenue. This implies that while some countries would have gained revenue from the adoption of VAT, others would not. Santiago and Yoo [17] used a Pooled Mean Group (PMG) to estimate the long run equilibrium relationship between tax composition and economic growth using a data set covering a broad cross-section of 69 countries with different income levels during the period 1970-2009. Their results showed that a reduction in income taxes while increasing VAT is associated with faster economic growth. In the disaggregation of consumption taxes, however, they also found a robust and positive association between VAT and sales taxes on economic growth. While they consistently found these results to hold in high and middle income countries, they did not find strong evidence on the significance of shifts in the tax composition and economic growth in the case of low-income countries.

Saeed et al. [18] investigated the validity of VAT in the South Asia Association for Regional Cooperation (SAARC) region; the basic objective of the study was to quantify the revenue effect of VAT in the SAARC region and to check, in particular, whether it has proved to be an effective form of taxation in those countries. It was first shown that a tax innovation, such as the introduction of VAT can boost the revenue ratio of SAARC countries which have adopted VAT and optimizing government to increase the tax ratio. Panel data of SAARC countries from 1995 to 2010 on various macroeconomic factors are obtained to determine the effect of VAT on revenue ratio. The results indicated a prosperous set of determinants of VAT adoption as it proves to be a vital instrument to collect tax and enhance revenue ratio. Estimates indicated that most of the SAARC countries have adopted VAT have gained a more effective tax instrument to upgrade their GDP to revenue ratio.

Rostami et al. [19] worked in the impact of fiscal policy on economic growth in Iran. The aim of the
research was to examine the effect of VAT on Gross Domestic Product (GDP) as economic growth for Iran economy. They explored time series data from 1979–2009, using autoregressive distributed lags (ARDL) model. Results showed that VAT has significant effect in real output for Iran and it means value added taxes influenced the growth of the economy. [20] used multiple regressions and correlation to analyze the relationship between the VAT revenue and macroeconomic indicators: gross domestic product, gross domestic product per capita, consumption expenditure, household consumption expenditure, government consumption expenditure, export, import and unemployment in Portugal over the period 2004-2011. The study found a positive relationship between VAT revenue and GDP with a negative relationship between unemployment and VAT revenue.

Bird and Gendron [21] examined the impact of tax structure on GDP and progressivity in Vietnam. They used cross-sectional time series over the period 1997-2010 for 61 different provinces in Vietnam. They employed Fixed-Effects and Two-Stage Least Squares, together with the regression model of tax progressivity. Their findings showed that Vietnam’s tax policies are progressive and that their integration policy impacts on the economic growth positively. In addition, the result proved that there exists a positive and significant relationship between VAT and GDP.

Antwi et al. [22] studied the impact of VAT rate changes on VAT revenue in Ghana. The research used ARDL co-integration procedures to analyze the effect of changes in VAT rates on VAT revenue in Ghana during the period 2003 – 2010. The study revealed that changes in VAT rates have not had any significant effect in VAT revenue. Rather, improvement in GDP had a more significant impact on the VAT revenue, even though tax buoyancy was generally low and this was attributed to a lapse in the tax system in Ghana.

Enokela [23] explored Nigeria data set to establish the relationship between Value Added Tax and economic growth, using secondary data and multiple regressions. The results revealed that Value Added Tax influenced positively and statistically significant with Gross Domestic Product (GDP): studies by Enokela [23] and Onoh [24] also revealed that VAT has positive and significantly impacted on Nigeria’s economic growth. Umeora [25] examined the effects of VAT on economic growth in Nigeria using data covering 1994-2010. The results of the regression analysis showed that VAT has a significant effect on GDP and also on total tax revenue. Closely related results were found by Bakare [26] in a study carried out to investigate the enormity of the impact of VAT on output growth in Nigeria. Ordinary least square regression technique (OLS) was employed for the empirical study. The study found that a positive and significant relationship exists between value added tax and output growth in Nigeria. The results of the finding showed that; the past values of VAT could be used to predict the future behaviour of output growth in Nigeria.

Chiogu and Ali [27] used the Engle and Granger cointegration technique to show that VAT has positive effect on economic growth in Nigeria. And more recently [28] used the Autoregressive Distributed Lagged (ARDL)-bounds testing approach to examine the cointegration and causal relationships between Value Added Tax (VAT) and economic development in Nigeria. Evidence from the study supports the existence of a long-run cointegration relationship between Value Added Tax and economic development. It also reveals that Value Added Tax has positive and significant impact on economic development both in the long-run and in the short-run.

Various studies reported that value added tax cannot predict economic growth: Skinner [29] analyzed the effect of taxation on economic growth in 31 African countries over the period 1965 - 1982. Using Two Stage Instrumental Variable (2SIV) technique, they found that taxes levied on personal and corporate incomes reduce economic growth; while value added tax have no significant effect on economic growth. Similar results were found by Miller and Russek [30] when they analyzed the relationship between fiscal structure and economic growth in 39 OECD countries from 1975 to 1984; they employed a pooled cross-section, time-series sample that allowed them to use a fixed-effect and random-effect model methodology. They found no statistically significant relationship between value added tax revenue and economic growth. Furthermore, found a positive correlation to exist between corporate income tax revenue and economic growth.

Lee and Gordon [31] explored the relationship between taxation and economic growth using both cross-sectional and time series data for
1970-1997. The findings suggest the negative effect of corporation income tax on economic growth. Value added tax, customs and excise duties are not significantly associated with economic growth. In Iran and some selected East Asian countries, [32] used panel data regression to analyze economic growth and income distribution effects of tax and also the impact of inequality on economic growth in the period 1990-2006, their results denote that the impact of value added tax on inequality and economic growth is insignificant. Ehigiamusoe [28] examined the nexus between the Tax System and economic growth in Nigeria from 1980 to 2011. Using correlation method, their results revealed that value added tax has no significant impact on economic growth.

More recently, Acti and Abigail [33] investigated the impact of taxation on economic growth of Nigeria using data from 1994 to 2012. The impact of total tax revenue on GDP was tested to ascertain if there is a relationship between growth in GDP and the growth in tax revenue over the years under review. Regression analysis was used with time series to ascertain the trend. The regression result shows a linear growth relationship between tax revenue and economic growth. To further test the impact of the individual independent variables on the dependent variable, a multiple regression was used. From the results there is no significant relationship between Company Income Tax, Value Added Tax and Gross Domestic Product. But there is a significant relationship between Petroleum Profit Tax, Custom, Excise Duties and Gross Domestic Product.

Afolayan and Okoli [34] employed the Error correction model to ascertain how VAT has impacted on Nigerian economic growth. They found a positive and insignificant correlation exists between VAT Revenue and real GDP as there are some problems inhibiting its potency. Granger Causality Test also revealed that the relationship between VAT and real GDP is unidirectional and a lag period of four years exists. That is real GDP granger causes VAT revenue; hence policy makers should favour all economic growth determinant factors for VAT to contribute significantly.

In Kenya, Adari [35] study focused on the introduction of VAT in Kenya that replaced sales tax in 1990. The study analyzed the structure, administration and performance of VAT. The estimated buoyancy and elasticity coefficients are less than unit, implying a low response to VAT revenue to change in GDP. This suggested the presence of laxity and deficiency in VAT administration. However, the estimation of buoyancy and elasticity coefficient were done in total disregard of the time series properties and without taking care of unusual observations in the data. Therefore results were not reliable for planning purposes.

Wawire [36] examined determinants of VAT revenue and assessed response of VAT revenue to changes in its tax base in Kenya. They identified the determinants of VAT to include GDP, institutional, demographic, and structural features of the economy. The study found that growth elasticity for VAT is all greater than one. The estimation result show that total GDP elasticity of VAT revenue is less than elasticity with respect to monetary GDP. This suggests the existence of an underground economy in Kenya over the period of analysis. It found that VAT revenue responds with substantial lags to changes in determinants especially international trade. There is therefore a challenge of creating a stable VAT system so that tax revenue can increase rapidly as the economy grows.

Njogu [37] examined the effect of value added tax on economic growth in Kenya and concluded that there exists a significant negative relationship between VAT rates and GDP; hence the researcher recommended that KRA should strive to reduce and/or maintain a low VAT rate in order to increase overall GDP. With regard to the effect of VAT rates on economic growth as measured by unemployment rate, the findings indicated that there exists a significant positive relationship between VAT rates and unemployment rate; hence the researcher recommended that KRA should strive to reduce and/or maintain a low VAT rate in order to maintain low unemployment rates within the economy.

3. RESEARCH METHODOLOGY

3.1 Model Specification

Akhor [1] in their analysis of the impact of indirect tax revenue on economic growth in Nigeria used an endogenous growth model specified as follows:-

\[ \text{GDP} = f (\text{IT}, \text{CED}, \text{VAT}) \]  \hspace{1cm} (3.2)

Where:
GDP = gross domestic product  
IT = income tax  
CED = custom and excise duties  
VAT = value added tax.

From the above functional relationship, the stochastic model is specified below:

$$\text{GDP} = a_0 + a_1 \text{IT} + a_2 \text{CED} + a_3 \text{VAT} + \mu$$  \hspace{1cm} (3.3)

$$a_1, a_2, a_3 > 0$$

The model was modified to fit custom and excise duty separately to enable assessment of their impact separately. If we incorporate these variables into Akhor’s model

$$\text{GDP} = f(CD, ED, IT, VAT)$$ \hspace{1cm} (3.4)

The model in its econometric format becomes:

$$\text{GDP} = a_0 + a_{1t} \text{CD}_t + a_{2t} \text{ED}_t + a_{3t} \text{IT}_t + a_{4t} \text{VAT}_t + \mu_t$$ \hspace{1cm} (3.5)

Where:

GDP = gross domestic product  
IT = income tax  
VAT = value added tax.  
CD=customs duty  
ED=excise duty

where;

$\mu_t$ is the Error term .

In consonance with economic theory, it is expected that value added tax, customs duty, income tax and excise duty to a large extent, determine the level of economic growth of a country. The following a priori expectation holds:

$$a_0, a_1, a_2, a_3, a_4 > 0.$$ The numerical values of the parameters were estimated using ordinary least square techniques.

3.3 Data Analysis and Presentation

A combination of cointegration and error correction modeling through regression was adopted in this research. The choice of these econometric techniques is based on the ability of cointegration to capture the information of non-stationary series without sacrificing the statistical validity of the estimated tax equations while the error correction model term captures the long-run relationship and majorly attempts to correct deviations from the long-run equilibrium. The analysis of data was conducted using EViews statistical package Version 7.0. The descriptive and inferential statistics was used in addition in order to build strong conclusions about the impact of indirect tax revenue on economic growth. The study used tables and figures for data presentation.

3.4 Diagnostic Tests

Time series diagnostic tests were carried out to ensure that the model satisfies the classical linear regression model assumptions. The data was subjected to diagnostic tests notably normality of the disturbance term and functional form misspecification, Stationary, serial correlation, multicolinearity and heteroscedasticity. These tests are meant to verify whether the data are normally distributed, stationary and have no mutual correlation among the independent variables and thereafter used it in regressions without fear of getting spurious results.

4. RESULTS AND DISCUSSION

4.1 Stationarity Test

When time series data is non-stationary and used for analysis, it may give spurious results which cannot be used for any meaningful inferences, since estimates obtained from such data will possess non constant mean and variance [38] Moreover, if the data is not stationary, the value of R-squared is high and
this makes it difficult to determine the relationship between the variables. Because this study used time series data, it is important to establish the stationary of the data. The variables are therefore tested for unit root and in its presence differencing is done to alleviate the problem. However, this leads to loss of some fundamental long run information hence biased solutions and this is corrected through Augmented Dickey Fuller Test.

Table 4.1(Appendix II) shows the unit root test for stationary using Augmented Dickey-Fuller. The result shows that all the variables (GDP, customs duty, excise duty, income tax and value added tax revenue) are stationary at first difference. Since the t-statistics are greater than the critical values at 1% and 5% level of significance in absolute term. We therefore conclude that all variables are not characterized by unit root problem and accept the hypothesis that says customs duty(CD), excise duty(ED), income tax(IT), value added tax(VAT), and gross domestic product(GDP) have no unit root problem.

4.2 Diagnostic Test

Time series data is associated with several problems which require investigation to avoid spurious results upon application of the OLS method of estimation. Primarily, the OLS method assumes serial uncorrelation, correct model specification, homoscedastic error term and absence of correlation between the error terms and the regressors. If these assumptions are violated, the estimated parameters would not meet the statistical threshold. Tests carried out on the data included the normality test, stationarity (unit root) test, multicollinearity test, serial correlation test and heteroscedasticity test.

4.2.1 Testing for Multicollinearity

Multicolinearity among the independent variables implies that they are perfectly correlated. If the explanatory variables in the model are perfectly linearly correlated, the parameters of the model become indeterminate and the method of OLS breaks down [39]. This violation is not a problem of the model or the disturbance term and therefore does not affect the BLUE properties of the OLS estimates [40]. In any practical context, the correlation between explanatory variables will be non-zero, although this will generally be relatively benign in the sense that a small degree of association between explanatory variables will almost always occur but will not cause too much loss of precision. However, a problem occurs when the explanatory variables are very highly correlated with each other.

Table 4.3 (Appendix III) shows multicolinearity test between independent variables. The VIF is less than 10, meaning that the variables are poorly correlated with each other. Therefore, there is no Multicollinearity among the independent variables. So it appropriate to use the independent variables simultaneously in order to run the regression model since there is no multicolinearity problem.

4.2.2 Test for serial correlation

(a) Durbin Watson Test for Autocorrelation

The Durbin Watson Test was used to test for autocorrelation. The statistic ranges between 1 and 4. A value of 2 indicates that there is no autocorrelation. With Durbin-Watson statistics of 1.954836, it shows that there is no autocorrelation and therefore the model gives a good description of the variables.

(b) Breusch-Godfrey Test for Autocorrelation

Serial correlation is usually as a result of model misspecification or genuine autocorrelation of the model error term. In the presence of serial correlation, ordinary least squares estimators are no longer Best Linear Unbiased Estimators (BLUE). Moreover, the R^2 may be overestimated, standard errors underestimated and t-statistics overstated [40]. There was therefore further need to test for serial correlation. Table 4.4 (Appendix III) shows the Breusch-Godfrey LM Test for autocorrelation is used to test for serial correlation among the error terms in the model, a violation of which would make emanating results have invalid statistical significance inferences. The null hypothesis states no serial correlation against the alternative hypothesis of serial correlation (p<0.05). The results indicate the p-value is 0.6651 which is greater than the critical p-value (0.05) hence accept the null hypothesis of no serial correlation. This shows the nonexistence of serial correlation.

4.3 Heteroscedasticity Test

Table 4.5 (Appendix III) shows the Harvey test of heteroskedasticity. The Probability Chi-Square value for observed R-squared is 0.3997(39.97%) which is more than 5 percent meaning that the
null hypothesis that there is no heteroscedasticity in the model is accepted. This shows that there is no evidence for the presence of heteroskedasticity since the p-values are considerably in excess of 0.05.

4.4 Regression Model Results Discussion

From the regression results in Table 4.6 (Appendix IV), the $R^2$ (0.6270) of the regression showed that the independent variables explain about 62.7% of the variations in the dependent variable. It implies that: customs duty, excise duty, income tax and value added tax explained about 62.7% percent systematic variations in output growth over the observed years in the Kenyan economy while the remaining 37.3% percent variation is explained by other determining variables outside the model.

The empirical result of the estimated model show that the probability value of F-statistics (0.000002) is less than the 5 per cent critical level. We therefore accept the alternative hypothesis that the explanatory variables which includes, Customs Duty (CD) Excise Duty (ED), income tax (IT), and Value Added Tax (VAT) are effective determinant factors of the economic growth (GDP). As a result the model was perfectly specified and there is statistical evidence to show that customs duty, excise duty, income tax and value added tax can jointly influence economic growth. The Durbin Watson statistic (1.955) illustrates the absence of auto correlation.

The regression model is of the form:

$$\text{GDP} = 0.0679 + 0.1228\text{CD} + 0.3709\text{ED} - 0.0252\text{IT} + 0.0356\text{VAT} + \mu$$

(4.1)

$$(3.044) \quad (5.988) \quad (-0.3653) \quad (0.5171).$$

4.5 The Statistical Significance of the Parameter Estimate

The statistical significance of the parameter estimate can be verified by standard error test; the adjusted $R^2$-squared, t-statistics, the F-statistic and the Durbin-Watson statistics.

4.5.1 The effect of sales tax/VAT on economic growth in Kenya

The null hypotheses ($H_{03}$) that VAT duties have no significant effect on economic growth in Kenya. We can test the statistical significance of the parameter estimate ($a_4$) by t-statistics. The null hypothesis dictates if probability of t-statistics is greater than 0.05 the parameter estimate is not statistically significant. From Table 4.6 (Appendix IV), the results of the t-test had probability values 0.6086 greater than 0.05; hence the non-statistical assumption of the parameter estimate is accepted. The decision rule is that the variable is not statistically significant at 5% level of significance.

In summary, since the econometric test applied in this study show a statistically insignificant relationship between the GDP and value added tax, the estimates of the model parameters show consistency with the theoretical expectations for variable $a_4$. The estimated value of the partial regression coefficients VAT, which is $a_4$ is positive. This implies that VAT correlates positively with economic growth (GDP). At 0.05 level of significance, the coefficient of VAT is statistically insignificant. This suggests that VAT is not an important determinant of growth. We therefore accept the null hypothesis that VAT has no significant effect on economic growth (GDP). Thus, we accept the null hypothesis which states that: VAT has no significant effect on economic growth in Kenya. The insignificant relationship between VAT and economic growth is quite surprising since value added taxes are not terribly harmful since they tax consumption and do not affect labour market incentives, yet they even provide an incentive to save and invest, this stimulates capital accumulation and economic growth.

The insignificant impact of VAT on growth is because VAT has an effect on consumption which in turn has effects on investment and employment and ultimately income and output. This outcome is in tandem with the result of studies carried out by many researchers [29], [30], [31], [32], [28] [33] and [34] among others, all of whom reported insignificant relationship between VAT and economic growth. However, this finding is inconsistent with the findings of [23], [19], [25] [41], and [42] who opined that VAT revenue has a significant effect on GDP.

The policy implication of the above findings is that the government should seal all identifiable loop holes for VAT revenue to contribute more significantly to economic growth in Kenya, VAT system should also be designed to be more growth friendly by making VAT less regressive through exempting and zero rating basic commodities. If this is done, the growth rate of
VAT revenue would increase thereby accelerating the internally generated revenue in the country and this would make the VAT system effective. An effective VAT system should satisfy the twin purpose of raising maximum revenue and at the same time encourage production. Moreover, tax revenue should be transparently and judiciously utilized for investment and in the provision of infrastructure and public goods and services so as to accelerate economic growth, employment and wealth creation.

4.6 Cointegration Tests

In this study, we employ Johansen Cointegration test. Therefore, by employing Johansen Cointegration test we make use of Trace statistics and Max-Eigen from the model respectively by comparing their values with the critical values at 5% level. If the values of the Trace/Max-Eigen are greater than the critical values, then, we conclude that there will be long-run equilibrium relationship. Otherwise, the regression residual is not co-integrated.

Table 4.7 (APPENDIX V), reports the Johansen’s cointegration results. Both Trace test and Maximum Eigen value tests indicate three cointegrating equations at the 0.05 level because the hypotheses at None, At most 1, At most 2, are rejected because they have significant probability values of less than 0.05. The result of the Johansen’s cointegration test shows the existence of a cointegrating equation. This means that the estimated parameters of the regression equation are the long-run coefficients that link economic growth and tax revenues. This shows that there exists a long run equilibrium relationship between GDP and the fundamentals used in the model.

5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

This study investigated the relationship between value added tax and economic growth in Kenya. The motivation for this study was primarily premised on the paucity of empirical literature on the value added tax – growth dynamics in developing economies. Data on revenue from value added tax and GDP, were collected from Kenya Revenue Authority (KRA), Kenya National Bureau of Statistics (KNBS) and Ministry of National Treasury, World Bank and International Monetary Fund. In trying to achieve this objective, Johansen cointegration through regression was adopted for the data analysis.

5.2 Conclusion

The main objective of the study was to find out the effect of value added tax revenue on economic growth in Kenya from 1973 to 2010. Analysis of research results has shown that value added tax has a positive and insignificant effect on economic growth in Kenya. Regression analysis results in Table 4.6 (Appendix IV) demonstrate this kind of relationship. It shows that if there is a 1% increase in value added tax, revenue would increase economic growth by 0.0356%. The insignificant impact of VAT on economic growth is that VAT has effect on consumption which in turn has effects on investment and employment and ultimately income and output. From the findings, it can be concluded that value added tax has an insignificant effect on economic growth.

5.3 Recommendations

Value Added Tax, being a consumption tax levied at each stage of the consumption chain is borne by the final consumer and is capable of increasing the prices of products thereby fuelling inflation and reducing real output. It may become necessary for the government to adopt the appropriate fiscal and monetary policies to control inflation arising from the imposition of Value Added Tax. Value added tax revenue should be transparently and judiciously utilized for investment and in the provision of infrastructure and public goods and services so as to accelerate economic growth, employment and wealth creation. The policy implication of the above findings is that the government should seal all identifiable loop holes for VAT revenue to contribute more significantly to economic growth in Kenya, VAT system should also be designed to be more growth friendly by making VAT less regressive through exempting and zero rating basic commodities. If this is done, the growth rate of VAT revenue would increase thereby accelerating the internally generated revenue in the country and make the VAT system effective. An effective VAT system should satisfy the twin purpose of raising maximum revenue while at the same time encouraging production.

COMPETING INTERESTS

Author has declared that no competing interests exist.
REFERENCES

A Prognosis Journal of Economic and Social Studies; 2013.
APPENDICES

Appendix I

Table 4.1 Descriptive statistics of gross domestic product, custom duty, excise duty, income tax and value added tax

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<th>Mean</th>
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<td>VAT</td>
<td>145707</td>
<td>694</td>
<td>23594</td>
<td>39178.82</td>
<td>5.908</td>
<td>39178.82</td>
<td>0.0521</td>
<td>0.9635</td>
<td>2.867</td>
</tr>
</tbody>
</table>

Source: Authors computation.

Appendix II

Table 4.2. Unit root test at first difference

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADF</th>
<th>1%</th>
<th>5%</th>
<th>Decision</th>
<th>Source: Computation using Eviews econometric software, version 7.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD</td>
<td>-5.544682</td>
<td>-3.626784</td>
<td>-2.945842</td>
<td>Reject H₀</td>
<td></td>
</tr>
<tr>
<td>ED</td>
<td>-5.624120</td>
<td>-3.626784</td>
<td>-2.945842</td>
<td>Reject H₀</td>
<td></td>
</tr>
<tr>
<td>GDP</td>
<td>-4.349471</td>
<td>-3.626784</td>
<td>-2.945842</td>
<td>Reject H₀</td>
<td></td>
</tr>
<tr>
<td>VAT</td>
<td>-5.627301</td>
<td>-3.626784</td>
<td>-2.945842</td>
<td>Reject H₀</td>
<td></td>
</tr>
<tr>
<td>IT</td>
<td>-4.96784</td>
<td>-4.23497</td>
<td>-3.54033</td>
<td>Reject H₀</td>
<td></td>
</tr>
</tbody>
</table>

Appendix III: Diagnostic Tests

Table 4.3 Variance inflation factors

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Uncentered</th>
<th>Centered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co</td>
<td>3.92E-05</td>
<td>1.001297</td>
<td>NA</td>
</tr>
<tr>
<td>D(CD)</td>
<td>0.000729</td>
<td>1.259000</td>
<td>1.258958</td>
</tr>
<tr>
<td>D(ED)</td>
<td>0.001710</td>
<td>1.059275</td>
<td>1.058904</td>
</tr>
<tr>
<td>D(IT)</td>
<td>0.002341</td>
<td>1.188650</td>
<td>1.188482</td>
</tr>
<tr>
<td>D(VAT)</td>
<td>0.002250</td>
<td>1.407744</td>
<td>1.407646</td>
</tr>
<tr>
<td>U(-1)</td>
<td>0.027970</td>
<td>1.020291</td>
<td>1.019554</td>
</tr>
</tbody>
</table>


Table 4.4 Serial correlation results

<table>
<thead>
<tr>
<th>Breusch-Godfrey Serial Correlation LM Test:</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-statistic</td>
</tr>
<tr>
<td>Observ*R-squared</td>
</tr>
</tbody>
</table>

Source: Computation using Eviews econometric software, version 7.

Table 4.5 Heteroscedasticity test

<table>
<thead>
<tr>
<th>Heteroskedasticity Test: Harvey</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-statistic</td>
</tr>
<tr>
<td>Observ*R-squared</td>
</tr>
<tr>
<td>Scaled explained SS</td>
</tr>
</tbody>
</table>

Source: Computation using Eviews econometric software, version 7.
Appendix IV

Table 4.6 Regression model results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.067919</td>
<td>0.014007</td>
<td>4.848889</td>
<td>0.0000</td>
</tr>
<tr>
<td>CD</td>
<td>0.122787</td>
<td>0.040333</td>
<td>3.044323</td>
<td>0.0046</td>
</tr>
<tr>
<td>ED</td>
<td>0.370923</td>
<td>0.062153</td>
<td>5.967917</td>
<td>0.0000</td>
</tr>
<tr>
<td>IT</td>
<td>-0.025155</td>
<td>0.068856</td>
<td>-0.365327</td>
<td>0.7173</td>
</tr>
<tr>
<td>VAT</td>
<td>0.035601</td>
<td>0.068842</td>
<td>0.517138</td>
<td>0.6086</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.627002</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.580377</td>
<td>S.D. dependent var</td>
<td>0.062702</td>
<td></td>
</tr>
<tr>
<td>S.E. of regression</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sum squared resid</td>
<td>0.052792</td>
<td>Schwarz criterion</td>
<td>-3.226482</td>
<td></td>
</tr>
<tr>
<td>Log likelihood</td>
<td>68.7172</td>
<td>Hannan-Quinn crit.</td>
<td>-3.367427</td>
<td></td>
</tr>
<tr>
<td>F-statistic</td>
<td>13.44783</td>
<td>Durbin-Watson stat</td>
<td>1.954836</td>
<td></td>
</tr>
<tr>
<td>Prob(F-statistic)</td>
<td>0.000002</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Computation using Eviews econometric software, version 7

Appendix V

Table 4.7 Cointegration test results

<table>
<thead>
<tr>
<th>Hypothesized No. of CE(s)</th>
<th>Eigenvalue</th>
<th>Trace Statistic</th>
<th>0.05 Critical Value</th>
<th>Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>None *</td>
<td>0.803382</td>
<td>123.3298</td>
<td>69.81889</td>
<td>0.0000</td>
</tr>
<tr>
<td>At most 1 *</td>
<td>0.590193</td>
<td>68.02905</td>
<td>47.85613</td>
<td>0.0002</td>
</tr>
<tr>
<td>At most 2 *</td>
<td>0.525285</td>
<td>37.69870</td>
<td>29.79707</td>
<td>0.0050</td>
</tr>
<tr>
<td>At most 3 *</td>
<td>0.200771</td>
<td>12.36730</td>
<td>15.49471</td>
<td>0.1402</td>
</tr>
<tr>
<td>At most 4 *</td>
<td>0.130325</td>
<td>4.747624</td>
<td>3.814366</td>
<td>0.0293</td>
</tr>
</tbody>
</table>

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

<table>
<thead>
<tr>
<th>Hypothesized No. of CE(s)</th>
<th>Eigenvalue</th>
<th>Max-Eigen Statistic</th>
<th>0.05 Critical Value</th>
<th>Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>None *</td>
<td>0.803382</td>
<td>55.30072</td>
<td>33.87687</td>
<td>0.0000</td>
</tr>
<tr>
<td>At most 1 *</td>
<td>0.590193</td>
<td>30.33035</td>
<td>27.58434</td>
<td>0.0216</td>
</tr>
<tr>
<td>At most 2 *</td>
<td>0.525285</td>
<td>25.33140</td>
<td>21.1362</td>
<td>0.0121</td>
</tr>
<tr>
<td>At most 3</td>
<td>0.200771</td>
<td>7.619677</td>
<td>14.26460</td>
<td>0.4187</td>
</tr>
<tr>
<td>At most 4 *</td>
<td>0.130325</td>
<td>4.747624</td>
<td>3.814366</td>
<td>0.0293</td>
</tr>
</tbody>
</table>

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by \(b^*S11*b=1\)):

Source: Computation using Eviews econometric software, version 7
### Appendix VI

#### Table 4.8 Error correction model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-0.001232</td>
<td>0.006264</td>
<td>-0.196625</td>
<td>0.8454</td>
</tr>
<tr>
<td>D(CD)</td>
<td>0.068626</td>
<td>0.027000</td>
<td>2.541725</td>
<td>0.0164</td>
</tr>
<tr>
<td>D(ED)</td>
<td>0.346363</td>
<td>0.041358</td>
<td>8.374727</td>
<td>0.0000</td>
</tr>
<tr>
<td>D(IT)</td>
<td>-0.087403</td>
<td>0.048386</td>
<td>-1.806354</td>
<td>0.0809</td>
</tr>
<tr>
<td>D(VAT)</td>
<td>0.080937</td>
<td>0.047437</td>
<td>1.706205</td>
<td>0.0983</td>
</tr>
<tr>
<td>U(-1)</td>
<td><strong>-1.028119</strong></td>
<td>0.167241</td>
<td>-6.147519</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

R-squared: 0.786713  
Adjusted R-squared: 0.751166  
Mean dependent var: -0.003142  
S.D. dependent var: 0.075290  
Sum squared resid: 0.042316  
Akaike info criterion: -3.574902  
Schwarz criterion: -3.310982  
Log likelihood: 70.34823  
Hannan-Quinn criter.: -3.482786  
F-statistic: 22.13115  
Durbin-Watson stat: 1.931441

Source: Computation using Eviews econometric software, version 7.

### Appendix V

**Fig. 4.1 Histogram-normality test results**

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