Responsiveness of Tax Revenues to Tax Reforms in Kenya: A Dummy Variable Approach

Kevin Wanjala

Tutorial Fellow, Department of Economics, Egerton University, Kenya.
Wanjalakevin89@gmail.com

Abstract

Tax reforms play a vital role in the economy of any country by improving its tax systems. Kenya has experienced significant changes in its economy over the last four decades. The government felt the need to increase its tax revenues to meet social obligations. Despite the undoubted good intentions of the Kenya Revenue Authority and a general increase in capacity within the organization as a whole, tax revenue has failed to show any signs of the dramatic anticipated increase. The study sought to establish the responsiveness of tax revenue to tax reforms in Kenya. In particular, the study examined how changes have affected revenue collected in Kenya by focusing on four significant reforms, i.e., the introduction of Simba system, Electronic Tax Registers (ETR), I-tax system and the reintroduction of capital gain tax. The general objective of the study was to establish the effects of tax reforms on tax revenue. The study adopted the elasticity approach to analysing the data using secondary data. The study found that Capital Gain Tax has a significant and positive impact on income tax, ETR has a positive and significant influence on VAT, and I tax a positive and significant effect on Total revenue. However, the study failed to establish a positive impact of the Simba system on customs duties.

***Keywords**: Tax reforms, I-tax, Capital gain tax, Simba system, Kenya*

I. INTRODUCTION

Kenya introduced the tax modernisation programme in 1986 with the hope that this would, among other things, enhance revenue collection (Moyi and Ronge, 2006). This has not been the case. A recent challenge by the government to meet its annual revenue targets has necessitated the need to look for avenues that will lead to an increase in revenue generated by way of taxation.

Further, the new governance structure of a devolved system is envisaged to increase government expenditure. This calls for policymakers to look for ways that will help the government to raise more revenue. Despite the measures taken by KRA to improve its revenue collections such as the authority has been falling short of its revenue targets. It calls for a study to establish whether the reforms have influenced revenue collections at all.

Kenya tax structure has changed tremendously over the years; massive reforms commenced in 1986 following the publication of Sessional paper I of 1986. Since then, implementation of major tax reforms introduced major changes in the tax system. Within the period of study (1994 to 2017),

many changes have occurred to the tax system in Kenya including; replacing sales tax with Value Added Tax. Introduction of the Tax Modernization Program, this has led to the automation of the tax system and paved way to the introduction of the Simba system in 2005, which was borrowed from Senegalese custom system known as GAINDE 2000. This system was introduced in Kenya to enhance the collection of customs duty and to facilitate self-assessment and to strengthen post-clearance audit

The other reform that took place around the same time as the Simba was the introduction of the Electronic Tax Registers (ERT) 2005 aimed at addressing the perennial problem of poor record keeping for business transactions; taxpayer segmentation into large taxpayer's office (LTO) and Turnover Tax for smaller taxpayers (TOT), and the medium taxpayer's office (MTO). The machines aimed to facilitate a substantial increase in the overall revenue collections, voluntary compliance, broadening of tax base and reducing the cost of tax collection.

In 2015, Kenya Revenue Authority (KRA) introduced an online platform for taxpayers to file their tax returns and submit payments through the mobile tax payment platform. This was aimed at reducing the cumbersome and slow paper-based system of filing of tax returns and thereby increasing the tax base through by bringing in more taxpayers into the net.

The other recent reform was the reintroduction of Capital Gain Tax (CGT) in 2015 which came about as a result of the amendment of Kenya's Finance Act (2014). The CGT had been suspended in Kenya since 1985 to encourage investment in the real estate sector as well as spur growth in the stock market. One of the main reasons for the current reintroduction of CGT is the need for the Government to balance an ever-increasing financial budget. In light of the enormous growth being experienced in the real estate as well as a robust stock market, the CGT will help the Government meet its revenue targets.

However, it has not been clear whether these tax reforms led to a significant change in the tax revenue collected. Therefore, a question arises: To what extent did the tax reforms affect the tax yield in Kenya? It is, therefore, necessary to analyse the impact of the tax reforms on tax revenue collected in Kenya.

II. LITERATURE REVIEW

Wawire (1991) on a study on tax reforms in Kenya for the period covering 1958 to 1959. The study considered tax capacity factor which was deemed as the major determinants of various tax ratios. By use of regression analysis, the study made a conclusion that rises in manufacturing, mining, and international trade raises the tax to GDP ratio.

Wang'ombe (1999) while studying revenue productivity of the Kenyan tax system for the period 1989 and 1998. The study established that Buoyancy estimates of the total tax in Kenya was 1.26 while the tax elasticity was 1.27. The study concluded that the Kenya tax system s both buoyant and elastic and as a result, it improved productivity.

Wawire (2000) analysed tax buoyancy and income elasticity of Kenya's tax system using GDP as a base. Additionally, the study regressed revenues from various tax sources with their tax bases.

The study concluded that the tax system in Kenya was not adequate to raise sufficient revenue. The study was however biased as it failed to consider all the significant tax revenue determinants. The study also failed to carry out time series diagnostic tests before estimation.
Murithi and Moyi (2003) in their study on tax productivity focused on the pre and post-tax reform period in estimating tax buoyancy and the productivity of the individual tax handles as well as the overall tax system. Their study established that tax reforms had a positive impact on both the individual taxes and the overall tax system. Additionally, the study also found the impact to be more on direct taxes as compared to indirect taxes, and they concluded that there were revenue leakages from the indirect taxes.

Karingi and Wanjala (2005) analysed the impact of tax reforms on tax revenue by considering the pre and post-tax adjustment period. They observed that tax yields had a steady increase in the pre-adjustment period.

Wawire (2011) on a study of the determinants of value added tax revenue in Kenya for the period 1964 to 2009 used dummy variables approach to cater for unexpected behavior in the data. The study used ordinary least squares approach and established that VAT revenues are responsive to their respective tax bases with lags.

Omondi et al. (2014) on their study of the effects of tax reforms on buoyancy and elasticity of the tax system in Kenya used data covering period 1963 to 2010. The study used a vector error correction approach, and it established that Kenya has a buoyant tax system; however, the structure is inelastic.

Theoretical Framework

The study sought to establish the responsiveness of tax revenue to tax reforms in Kenya by using elasticity approach. In this regard, the study followed the model developed by Singer (1968) and used by Chand and Wolf (1973), Khan (1973) and Artus (1974). According to Chipeta (1998), this approach is useful in estimating tax elasticity when discretionary changes are more than the number of observations. In this regard, the dummy is included in the model as a proxy for the discretionary tax measure to estimate tax elasticity.

The model is estimated of the form:

$$LnT_p = \alpha_p + \beta_p LnY + \sum \delta_i D_i + \varepsilon_p \ldots\ldots\ldots\ldots 1$$

Where: Where the dummy variable D_i= (i = 1, 2.) takes zero (0) before the discretionary change and one (1) after the change. The coefficient β_p estimates the revenue elasticity. The summation takes care of the possibility of multiple changes during the period covered

III. METHODOLOGY

Before carrying out regression analysis, it is crucial that the model to be estimated is specified to get the coefficients that will not lead to biased and inconsistent results. Data were disaggregated into two period, pre and post-reforms, and dummy variables regarding 0 and 1 was introduced to measure the impact of the reforms on various tax components. Due to the unavailability of data, on the number of annual ETR and Simba system transaction, and the number

of filed returns, the data on Gross Domestic Product (GDP), Consumer expenditure, and imports were used as proxy bases for income tax, VAT and customs duties respectively.

Impact of Capital Gain Tax on Income Tax

The effect of capital gain tax on income tax was analysed using data from 2012 to 2017. The study estimated elasticity for two distinct periods, i.e., 2 years pre-CGT and Post-CGT. The log of Income-tax revenue was regressed against log Gross Domestic Product (GDP) base for each period. The model is presented in equation 2.

$$Log\ IT = a_o\ + a_1 logGDP\ \ + \varepsilon_t \ \ldots\ldots\ldots 2$$

Where:

IT - is Income Tax, GDP – is Gross Development Product, a_o - is the Y-intercept, a_1 - is the slope coefficient (elasticity) before re-introduction of the capital gain tax, ε_t - is the error term

To capture the effect of capital gain tax on Income tax, we introduced a dummy variable (Verbeek, 2004) with 0 representing the period before reintroduction of CGT and 1 representing the period after the reintroduction of CGT. Equation 2 is thus parameterized to equation 3

$$\text{Log IT} = a_0 + a_1 DUMMY_1 + \ a_2 \text{log GDP} + \ a_3 Z_1 \ + \varepsilon_t \ \ldots\ldots\ldots 3$$

Where:

$DUMMY_1$ is the shift (intercept) dummy variable and takes values 0 and 1, 0 denoting the period 2012 to 2014 while 1 denoting the period 2015 to 2017.

Z_1 is the interaction term, it is composed of the product of *DUMMY₁* and the explanatory variable, as shown in equation 4

$$Z_1 = DUMMY_1\ x\ log\ GDP \ldots\ldots\ldots\ldots\ldots 4$$

Impact of Simba System on Custom Duties

The effect of Simba system on customs duties was analysed using data from 1995 to 2015. The study estimated elasticity for two distinct periods, i.e., 10 years before the Simba system was introduced and 10 years the system has been in operation. The log of customs duty revenue was regressed against log import base for each period. The model is presented in equation 5

$$Log\ CD = a_o\ + a_1 logIM\ \ + \varepsilon_t \ldots\ldots\ldots\ldots\ldots 5$$

Where:

CD - customs duties revenue, IM – Imports, a_o - is the Y-intercept, a_1 - is the slope coefficient (elasticity) before the introduction of the Simba system, ε_t – is the error term

Dummy variables were introduced to capture the effect of Simba system on customs duty. In this regard equation, 5 was parameterized to equation 6.

$$\text{Log CD} = a_0 + a_1 DUMMY_1 + a_2 \log \text{IM} + a_3 Z_1 + \varepsilon_t \ldots\ldots\ldots 6$$

Where:

$DUMMY_1$ – is the shift (intercept) dummy variable and takes values 0 and 1, 0 denoting the period 1995 to 2004 while 1 denoting the period 2005 to 2015.

Z_1 – is the interaction term, it is composed of the product of *DUMMY₁* and the explanatory variable, as shown in equation 7

$$Z_1 = DUMMY_1 \; x \; log \; IM \ldots\ldots\ldots\ldots\ldots 7$$

Impact of ETR machine on Value Added Tax

The effect of ETR machine on VAT was analysed using data from 1995 to 2015. The study estimated elasticity for two distinct periods, i.e., 10 years before ETR machine was introduced and 10 years since the machines have been in operation. The log of Value Added Tax was regressed against log consumer expenditure for each period. The model is presented in equation 8

$$Log \; VAT = a_o + a_1 log \; CE + \varepsilon_t \ldots\ldots\ldots\ldots\ldots 8$$

Where:

VAT – Value Added Tax, CE – Consumer expenditure, a_o - is the Y-intercept, a_1 - is the slope coefficient (elasticity) before the introduction of ETR machines, ε_t – is the error term

Dummy variables were introduced to capture the effect of ETR machines on Value Added Tax. In this regard equation, 8 was parameterized to equation 9.

$$\text{Log VAT} = a_0 + a_1 DUMMY_1 + a_2 \log \text{CE} + a_3 Z_1 + \varepsilon_t \ldots\ldots\ldots\ldots\ldots 9$$

Where:

$DUMMY_1$ – is the shift (intercept) dummy variable and takes values 0 and 1, 0 denoting the period 1995 to 2004 while 1 denoting the period 2005 to 2015.

Z_1 – is the interaction term, it is composed of the product of *DUMMY₁* and the explanatory variable, as shown in equation 10

$$Z_1 = DUMMY_1 \; x \; log \; CE \ldots\ldots\ldots 10$$

Impact of I-Tax on Total Tax Revenue collection

The effect of the I-tax system on total revenue collection in Kenya was analysed from 2012 to 2017. The study estimated elasticity for two distinct periods, i.e., 2 years before introduction of I-tax and 2 years since the I-tax system has been in use. The log of total tax revenue was regressed against log Gross Domestic Product (GDP) base for each period. The model is presented in equation 11.

$$Log\ TTR = a_o\ + a_1 \log GDP\ \ + \varepsilon_t \ldots\ldots\ldots 11$$

Where:

TTR – Total Tax Revenue, GDP– Gross Domestic Product, a_o - is the Y-intercept,

a_1 - is the slope coefficient (elasticity) before the introduction of I-Tax system , ε_t – is the error term

Dummy variables were introduced to capture the effect of the I-Tax system on Total Tax Revenue. In this regard equation, 11 was parameterized to equation 12.

$$\text{Log TTR} = a_0 + a_1 DUMMY_1 + \ a_2 \text{log GDP} + \ a_3 Z_1 \ + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots 12$$

Where:

$DUMMY_1$ is the shift (intercept) dummy variable and takes values 0 and 1, 0 denoting the period 2012 to 2014 while 1 denoting the period 2015 to 2017.

Z_1 – is the interaction term, it is composed of the product of $DUMMY_1$ and the explanatory variable, as shown in equation 13

$$Z_1 = DUMMY_1 \; x \; log \; GDP \ldots\ldots\ldots\ldots 13$$

Definition and Justification of Explanatory Variables

Consumer Expenditure: Consumer expenditure is the amount of money consumer spend on purchases of products or services. This variable has been used as a proxy base for VAT and therefore used to measure the effect of ETR because, VAT is charged on various stages of production process, and also at the wholesale and retail level, the final VAT burden of is borne by the consumers (Mahon, 1998)

Gross Domestic Product: A measure of National income in a country. GDP is used as a proxy base for the total tax revenue. GDP gives the overall trend of the country's economic performance

due to tax reforms. Tax revenue varies proportionately with the shocks that the economy experiences (Mansfield, 1972)

Import: The value of goods imported into the country. Customs duty is generally imposed on import's Cost, Insurance and Freight (CIF) apart from the zero-rated or exempted products. Thus, this study used the value of imports as the proxy as for customs duty (Chipeta, 1998).

IV. ESTIMATION AND ANALYSIS OF REGRESSION RESULTS

Since the data used in this study was time series, it is prudent to test for the existence or absence of unit root as it is a common characteristic in time series data. The absence of unit roots denotes stationarity while its presence denotes non-stationarity. Stationarity of the variables has to be examined before the time series data analysis to minimize the effect of possible trends and seasonal variation in the economy to avoid a spurious regression problem. In this context, this study adopted the Augmented Dickey-Fuller procedure (ADF) as it integrates lagged values of the dependent variable in the regression model. The advantage of incorporating the lagged values is that it reduces the chances of the error term being autocorrelated (Dickey and Fuller, 1981) All the variables are stationary in levels, meaning that unit root is absent, we therefore proceed and run normal Ordinary Least Square Regression. The results are shown in table 1.

Table 1. Unit Root Test Results

Variables	**Augmented Dickey-Fuller Test**	
	Test statistic (Zt)	Level of significance
Log TTR	-6.178	0.0190
LogIT	-5.889	0.0496
Log VAT	-5.423	0.0277
Log GDP	-3.957	0.0407
Log CD	-5.375	0.0345
Log CE	-5.1717	0.0456
Log IM	-6.502	0.0033

Impact of Capital Gain Tax on Income Tax

The impact of capital gain tax on income tax was estimated using GDP as the proxy base for income. Results are presented in table 2, the coefficient for GDP was found to have the expected positive sign and statistically significant at 1% level. GDP coefficient was found to be 3.1228; therefore a one percentage point increase in GDP would approximately result to 3.1228 percent increase in the income tax, ceteris paribus. The results also indicate a shift in the elasticity slope coefficient from 2.9267 before capital gain tax to 3.122 post capital gain tax, a growth of

0.195. On the other hand, R-squared (Coefficient of Determination) was 0.9717, implying that 97.17 percentage changes in income tax were explained by GDP.

Table 2. Regression results for the effect capital gain tax on Income Tax

	Coefficient	Std. Error	t	p>t
Pre-Capital Gain Tax				
Constant	-37.9259	3.9916	-9.50	0.001
Log GDP	2.9267	0.2288	12.79	0.000
Post-Capital Gain Tax				
Constant	-41.3381	14.2625	-2.90	0.101
Log GDP	3.1228	0.8216	3.80	0.043
DUMMY	15.59847	19.3412	0.81	0.505
Intercept term	-0.891327	1.1096	-0.80	0.506
R-squared pre CGT	0.9761			
R-squared Post CGT	0.9717			

Impact of Simba System on Custom Duties

To determine the effect of Simba system on Customs Duties; customs duty was regressed against the value of import. Results are presented in table 3, the coefficient for import was found to have a negative sign. Import coefficient was found to be -0.1487749; therefore a one percentage point increase in imports would approximately result to 0.148 percent decrease in the customs duties, ceteris paribus. The results also show that there has been a shift in the elasticity coefficient by a decrease of 0.7072 (from 0.8556 to -0.1488). On the other hand, R-squared (Coefficient of Determination) was 0.9429, implying that 94.29 percentage changes in income tax were explained by imports. These results are, however, not significant at 1%.

Table 3. Regression Results for the Impact of Simba System on Custom Duties

	Coefficient	Std. Error	t	p>t
Pre-Simba System				
Constant	-2.991	1.549	-1.93	0.070
Log IM	0.8556	0.099	8.62	0.000

Post-Simba system				
Constant	12.332	4.558	2.71	0.016
Log IM	-.1488	.2995	-0.50	0.626
DUMMY	-10.956	2.037	-5.38	0.000
Intercept term	1.094	.2106	5.20	0.000
R-squared (pre-Simba system)	0.8052			
R-squared (post-Simba system)	0.9429			

Impact of ETR machine on Value Added Tax

The effect of ETR machine on Value Added Tax was analysed using consumer expenditure as the base for VAT. The coefficient for private consumption expenditure was found to have the expected positive sign and statistically significant at 1% level. Private consumption coefficient was found to be 3.7069; therefore a one percentage point increase in the private consumption would approximately result to 3.7069 percent increase in the VAT, ceteris paribus. The results also indicate a shift in the elasticity slope coefficient from 2.873 before ETR to 3.7069 post ETR, a growth of 1.223. On the other hand, R-squared (Coefficient of Determination) was 0.9885, implying that 98.85 percentage changes in VAT were explained by private consumption expenditure.

Table 4. Regression Result for the Effect of ETR machine on Value Added Tax

	Coefficient	**Std. Error**	**t**	**p>t**
Pre-ETR				
Constant	-36.86	1.677	-21.98	0.000
Log CE	2.87	0.1001	28.72	0.000
Post-ETR				
Constant	-50.66	5.614	-9.03	0.000
Log CE	3.71	.3392	10.93	0.000
DUMMY	21.67	6.332	3.42	0.004
Intercept term	-1.29	0.3824	-3.40	0.004
R-squared pre-ETR	0.9787			

R-squared post-ETR	0.9885

Impact of I-Tax on Total Tax Revenue collection

The impact of I-tax on Total Revenue was estimated using GDP as the proxy base for total revenue. Results are presented in table 5, the coefficient for GDP was found to have the expected positive sign and statistically significant at 1% level. GDP coefficient was found to be 3.1001; therefore a one percentage point increase in GDP would approximately result to 3.1001 percent increase in the total revenue collected, ceteris paribus. The results also show that there has been a shift in the elasticity slope by an increase of 0.6488 (from 0.2451 to 3.1005). On the other hand, R-squared (Coefficient of Determination) was 0.9912, implying that 99.12 percentage variation in total revenue was explained by GDP.

Table 5. Regression Results for the Impact of I-tax on Total Revenue Collected

	Coefficient	**Std. Error**	**t**	**p>t**
Pre-I-tax				
Constant	-28.99	3.648	-7.95	0.001
Log GDP	2.452	.2091	11.72	0.000
Post-I-tax				
Constant	-40.26	8.9304	-4.51	0.046
Log GDP	3.101	.51445	6.03	0.026
DUMMY	24.901	12.110	2.06	0.176
Intercept term	-1.427	.69473	-2.05	0.176
R-squared pre-I-tax	0.9717			
R-squared post-I-tax	0.9912			

V. CONCLUSION

Elasticity models were used to determine the effect of tax reforms on Revenue collection in Kenya. Tax elasticity is essential in finding out the extent to which a tax responds to changes in a proxy base (policy). In this study GDP was used as a base of Income tax and Total tax revenue, Consumption expenditure was used as a base for VAT, while the value of import was used as a base for customs duties. Tax elasticity measures, the automatic growth in tax revenue, as a result

of a policy or discretionary change. The larger the value of elasticity, the more the revenue collected.

The findings established that elasticity for GDP, Consumer expenditure were positive and significant, an indication that Income tax, total revenue, and VAT are more receptive to discretionary changes. There was also an increase in the slope coefficient, the post-reform coefficient being higher than the pre-reform elasticity coefficients.

The high tax elasticity is indications that the three taxes (Capital gain tax, Income tax, and VAT), increase more proportionately than the bases to which they are attached, i.e., GDP, and Consumer expenditure respectively. This shows that ETR machines have contributed positively to VAT collection, I tax has contributed positively to total revenue collected, and capital gain tax has also contributed positively to income tax collected by the Kenya Revenue Authority.

On the other hand, the negative and insignificant elasticity index on customs duty suggests that the customs duty base, in this case, imports, grew faster than customs duties despite the introduction of Simba system. The revenue collected was less than proportionate to value of imported products by Kenya. This suggests that Kenya's custom is inefficient and this can be attributed to many factors such as; excessive tax evasion at the ports, corruption at the ports, too many duty-free goods or inefficiency on the part of KRA concerning customs duties collection.

VI. POLICY RECOMMENDATION

There is need for an improvement in the tax productivity in the country, especially on customs duty. This can be achieved by reviewing the customs procedures that are currently cumbersome and enhancing a tax monitoring function.

Secondly, there is need to ensure that revenue is collected in all the economic sector without leaving behind the informal sector who are currently not taxed, this can be achieved by the help of simplified registration system and processes.

Thirdly, there is a need to broaden Kenya's tax base through tax rate reductions and sealing the revenue seepages through enhancing efficiency in the Kenya Revenue Authority.

Fourthly, Kenyan government should start a fight against tax fraud, especially at the ports. It should also start sensitization campaigns to educate citizens about the economic consequences of tax evasion.

REFERENCES

Artus, K. K. (1974). Tax revenue forecasting: A Methodological study with application to Turkey. *Studies in Domestic Finance, 5*(4), 121-130

Chand, S. K., & B. Wolf. (1973). *The Elasticity and Buoyancy of the Tax System of Peru, 1960–1971: An Empirical Analysis*. Unpublished Paper, IMF.

Cheeseman, N., & Griffiths, R. (2005). *Increasing tax revenue in Sub-Saharan Africa: The case of Kenya*. Oxford Council on Good Governance Economic Analysis No. 6. United Kingdom: Oxford

Chipeta, C. (1998). *Tax reform and tax yield in Malawi*. AERC Research Paper No. 81. Nairobi: AERC.

Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time Series with a unit root. *Journal of the American Statistical Association, 74*, 427–431.

Dickey, D. A., & Fuller, W. A. (1981). Likelihood ratio statistics for autoregressive time series with a unit root. *Econometrica, 49*, 1057–1072.

Karingi, S. N., & Wanjala, B. (2005). *Tax reforms experience of Kenya*. Research Paper No. 2005/67. Worldwide Institute of Development Economics Research. United Nations University.

Mansfield, C. Y. (1972). Elasticity and Buoyancy of a tax system: A method applied in Paraguay. *IMF Staff Papers.*

Moyi, E., & Ronge, E. (2006). *Taxation and tax modernization in Kenya: a diagnosis of performance and options for further reform.* Institute of Economic Affairs, December.

Muriithi, M. K., & Moyi, E. D. (2003). *Tax reforms and revenue mobilization in Kenya*. AERC Research Paper 131, Nairobi: AERC.

Omondi, O.V., Wawire, N.H., Manyasa, E.O., & Thuku, G.K. (2014), Effects of tax reforms on buoyancy and elasticity of the tax system in Kenya. *International Journal of Economics and Finance*, 6(10), 97-111

Singer, N. M. (1968). The use dummy variable in establishing the income elasticity of state income tax revenue. *National Tax Journal*, 21, 200–204.

Wang'ombe, D. K. (1999). *An analysis of the revenue productivity and some administrative factors of the Kenyan tax system*. University of Nairobi, M.A Thesis, unpublished.

Wawire, N. H. W. (1991). *An empirical assessment of tax performance in Kenya: 1958–1989.* M. A. Research Paper, Kenyatta University.

Wawire, N. H. W. (2000). Revenue productivity implications of Kenya's tax system. In K. Kwaa Prah, & A. G.M. Ahmed (Eds.), *Africa in transformation. Political and economic issues* (Vol. 1, pp. 99–106). Addis Ababa: OSREA.

Wawire, N. H. W. (2003). Trends in Kenya's tax ratios and tax effort indices, and their implication for future tax reforms. *Egerton Journal, 4*, 256–279.

Wawire, N. H. W. (2006). *Determinants of tax revenues in Kenya*. Unpublished Ph.D. Thesis, Kenyatta University.

Wawire, N. H. W. (2011). *Determinants of value added tax revenue in Kenya*. The CSAE Conference Paper, March, St Catherine's College.