Dynamics of Revenue Generation in Tanzania, Kenya and Uganda: A Co-integration and error-correction modeling approach

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Abstract

The dynamics of revenue generation in Tanzania, Kenya and Uganda are explored. Results demonstrate that revenue generation is sluggish in Tanzania compared to Kenya and Uganda. Macroeconomic environment, economic structure, and level of development are fundamental at explaining these differences. Results reveal that these countries have the potential for generating more revenue, if could address weaknesses inherent in their tax systems. Computerization of tax collection; expansion of the tax base; address problems associated with tax revenue leakages; and instituting strong legal enforcements should be at the fore in the ongoing tax reforms so as to enhance tax revenue collection.

Key worlds: Short-run, Long-run, Revenue generation, Tax buoyancy, Co integration, Error-correction, Tanzania, Kenya, Uganda

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1.0 Introduction

In the wake of the 1970s and early 1980s many least developing countries (LDCs) were afflicted with severe economic crises. Many of them faced crises of macroeconomic imbalances, manifested in high rates of inflation; accelerating foreign exchange constraints; unmanageable balance of payments and fiscal deficits, and high external debt ratios. Additionally, GDP growth rates were negative or failing to match the rate of population increase. Weak national policies, weak institutional frameworks and drastic and unfavorable changes in external conditions also aggravated the crisis. In responding to these crises many LDCs undertook economic reforms although at varying rates of implementation and commitment.

The primary motivation of economic reforms was meant to promote rapid economic growth, achieve macroeconomic stability, reduce fiscal vulnerability and, of late, alleviate poverty. Although some remarkable performances have been recorded in these countries in terms of high economic growth rates and lower inflation rates, a remaining challenge is to address fiscal imbalances, though vary among them. The persistent increase of fiscal deficits in Tanzania, Kenya and Uganda despite implementing bold economic reforms to address these imbalances suggests that revenue-generating capacity of these three countries has not been commensurate with the growth of their expenditures. Since a large proportion of finance for expenditures comes from tax revenue, the lagging behind of revenues could be linked to the revenue generation capacity of their tax system. This may reflect a combination of factors, including the inherent features of their tax systems; the resilience of the tax systems to changes in economic reforms and differences in macroeconomic conditions, economic structure, level of development and institutional framework. This paper is an attempt to analyze revenue generation capacity in Tanzania, Kenya and Uganda and factors affecting revenue generation.

A substantial literature on tax performance exists (Teera and Hudson, 2004; Agbeyegbe et al. 2006; Baunsgaard and Keen, 2005; Khattry and Rao, 2002; Gupta, 2007; Davoodi and Grigorian, 2007; Ebrill et al. 1999; Ghura, 2002; 2003; Osoro, 1993; Steenekamp, 2007; Rajaraman et al., 2005; Indraratna, 2003; Begum, 2007 Creedy and Gemmell, 2001; Kusi, 1998; Chipeta, 1998; 2002; Ariyo, 1997; Ayoki, et al. 2005; Murith and Moyi, 2003), but most of these studies are based on cross-country regression analysis, which do not provide any policy relevancy specific to a particular country. Furthermore, these studies are static in nature; do not capture dynamic short-run and long-run relationships of tax performance in developing countries. Moreover, countries differ in many respects. They have different economic structure, trade regime, macroeconomic environment, political economy, and the mix of protective policies and revenue mobilization (Teera and Hudson, 2004; Gupta et al., 2002; 2005). Therefore, in order to understand underlying factors affecting revenue generation in different countries, each country must be studied separately. This paper fills this gap as it contributes to this literature on revenue generation by analyzing the relationships of short-run and long-run revenue generation in Tanzania, Kenya and Uganda as an illustrative example.

The focus of this paper is to examine factors affecting revenue mobilization both in the short-run and long-run in these countries. The findings of this paper are important from different perspectives. First, they have potential to providing information that can be used in revenue

forecasting. This information is essential for budget planning and management purposes. Second, this information is crucial for design, formulation and execution of sound fiscal and macroeconomic policies. The data used in this paper were drawn from various official government reports from the bureaus of statistics, central banks, and ministries of finance and revenue authorities of the respective countries. These data were complemented with data from other various sources such as the Government Finance Statistics (GFS) and International Finance Statistics produced by the IMF; and World Development Indicators reports and African Development Indicators produced by the World Bank.

The rest of this paper is organized as follows. The review of the theoretical and empirical studies on tax performance is presented in next section. It presents the theoretical, conceptual and measurements issues on tax performance. It also provides a summary of both theoretical and empirical evidence on the determinants of tax performance. This is followed by a description of the trends of tax buoyancy of the tax system in Tanzania, Kenya and Uganda. Thereafter, econometric approaches used to analyze revenue generation capacity in the three countries are described. Lastly concluding remarks and policy suggestions are summarized.

2.0 Theoretical, Conceptual and Measurement Issues

The most basic characteristic of an effective tax system is that it generates sufficient revenues to finance government expenditures and development (Steenekamp, 2007; Indraratna, 2003; Teera and Hudson, 2004). The capability of the tax system of a country to raise adequate resources to finance government spending is determined by the policy tax structure, efforts by the government to collect taxes or effectiveness of tax administration, prevailing macroeconomic conditions, the level of development and the structure of the economy (Steenekamp, 2007; Teera and Hudson, 2004). Revenue generation is a function of the available tax base, the tax rates applied to the tax bases, and the probability of collecting a specific levy.

A number of approaches have been used to assess revenue performance. Among notable approaches are the tax effort approach, the regression approach, the average effective tax rate approach, tax elasticity approach and tax buoyancy approach. Others include the revenue adequacy, economic efficiency, equity and simplicity approaches (Osoro, 1993; Ghura, 2002; Steenekamp, 2007; Teera and Hudson, 2004; Gupta, 2007; Davoodi and Grigorian, 2007; Begum, 2007). Most of these approaches are generally static in nature. They only describe tax revenue at a given point in time (Begum, 2007; Steenekamp, 2007; Rajaraman et al., 2005). They cannot explain plausible short-run and long-run dynamic changes in the tax system. It is important to use measures that are able to capture dynamic changes in a system for revenue forecasting purposes, and to help assess the progressiveness of a tax system both in the short- and long-run (Indraratna, 2003). Tax elasticity and buoyancy are measures, which can capture short and long-run dynamic changes in a tax system (Indraratna, 2003; Begum, 2007; Steenekamp, 2007; Rajaraman et al., 2005).

Tax elasticity is defined as the percentage change in total tax or individual taxes associated with a given percentage change in GDP. The use of the tax elasticity typically is based on the assumption that there are no changes in the tax base, in the statutory rates of existing taxes, in administrative efficiency and in the type of taxation used. That is, there are no changes to the tax structure and tax system (Osoro, 1993; Steenekamp, 2007; Rajaraman et al., 2005;

Indraratna, 2003; Begum, 2007 Creedy and Gemmell, 2001; Kusi, 1998; Chipeta, 1998; 2002; Ariyo, 1997; Ayoki, et al. 2005; Murith and Moyi, 2003). If so, it is assumed to capture automatic or natural responsiveness of tax yields to changes in income.

Tax elasticities can be estimated using two methods. The first, involves estimating the ratio of the weighted sum of elasticities of individual taxes to changes in income. Overall tax elasticity for the individual tax is determined by:

$$E_{TY} = \frac{T_1}{T^*_t}\left(\frac{\Delta T_1}{\Delta Y}.\frac{Y}{T_1}\right)+\frac{T_k}{T^*_t}\left(\frac{\Delta T_k}{\Delta Y}.\frac{Y}{T_k}\right)+\ldots+\frac{T_n}{T^*_t}\left(\frac{\Delta T_n}{\Delta Y}\frac{Y}{T_n}\right) \qquad (1)$$

where: E_{TY} = elasticity of tax revenue to income (GDP); T^*_t = adjusted total tax revenue; ΔT = changes in adjusted tax revenue; T_k, T_n = adjusted tax revenue from k^{th} and n^{th} taxes in a system of n taxes; Y = income (GDP) and ΔY = changes in GDP.

The second approach involves estimating a double natural logarithm regression equation for adjusted tax revenues on national income (GDP) (Teera and Hudson, 2004; Osoro 1993; Indraratna, 2003; Begum, 2007; Steenekamp, 2007; Creedy and Gemmell, 2001; Kusi, 1998; Chipeta, 1998; 2002; Ariyo, 1997; Ayoki, et al. 2005; Murith and Moyi, 2003). It is estimated from the following Cobb-Douglass regression equation:

$$T^* = \ln\gamma Y^{\beta}\varepsilon \qquad (2)$$

where T* is annual adjusted tax revenue, Y is annual nominal gross domestic product (GDP), ε is the multiplicative error term, β provides the estimates of tax elasticity and $\ln\gamma = \alpha$ is a constant. The logarithmic transformation gives the following linear form:

$$\ln T^*_t = \alpha + \beta_1 \ln Y_t + \varepsilon_t \qquad (3)$$

where β_1 is tax elasticity. A value less than one suggests low tax elasticity, which implies that the tax system is incapable of meeting growth in fiscal expenditures. Whereas a value greater than one suggests increased responsiveness and demonstrates the efficacy of the tax system, hence suggesting that tax revenue collections are able to meet rising expenditures (Creedy and Gemmell, 2001; Kusi, 1998; Chipeta, 1998; 2002; Ariyo, 1997; Ayoki, et al. 2005; Murith and Moyi, 2003).

However, where tax policy instruments are subject to change from time to time, the elasticity of tax revenue may be difficult to estimate with appreciable degree of accuracy (Rajaraman et al., 2005). In developing countries such as Tanzania, Kenya and Uganda that have experienced many changes in their tax policies, it may be difficult to identify and separate all discretionary tax policies that have been undertaken in the country. In this context, where tax policy parameters are in a state of constant flux, the tax buoyancy provides an alternative approach to evaluating tax revenue performance. Tax buoyancy estimates the revenue response with endogenized tax policy. Tax buoyancy measures the total response of a tax to a change in income and it shows the growth that result from the automatic growth of the base caused by an increase in GDP and from discretionary tax changes. Unlike tax elasticity, the

estimation of tax buoyancy does not require that discretionary changes in tax policy be controlled (Osoro, 1993, 1994; Greedy and Gemmell, 2001; Kusi, 1998; Chipeta, 1998; 2002; Ariyo, 1997; Ayoki, et al. 2005; Murith and Moyi, 2003; Teera and Hudson, 2004; Indraratna, 2003; Begum, 2007; Steenekamp, 2007).

Tax buoyancy similarly can be estimated in two ways. First by calculating the ratio of percentage change in tax revenue to percentage change in GDP as follows:

$$b_t = \%\Delta T_t / \%\Delta Y_t \quad (4)$$

Where: $\%\Delta T_t = [(T_{i+1}-T_i)/T_i]100$ is the percentage change in tax revenue between year i and year i+1 and $\%\Delta Y_t = [(Y_{i+1}-Y_i)/Y_i]100$ is the percentage change in GDP between year i and year i+1. Second, is using a double natural logarithm regression equation, in which case tax revenue is regressed against the tax base (GDP) as follows:

$$\ln T_t = \beta + \delta \ln Y_t + \varepsilon_t \quad (5)$$

Where: T is unadjusted tax revenue, Y is nominal GDP, β is the constant, δ is the tax buoyancy and ε is a stochastic disturbance term.

There are conceptual similarities and differences between tax elasticity and buoyancy approaches. They are both estimated as a ratio of the percentage change in tax revenue to a given percentage change in GDP. The interpretation of the tax elasticity and buoyancy coefficients is the same. That is, a coefficient of one indicates a commensurate growth of both revenue and GDP, while a coefficient less than one indicate lagged revenue growth compared to GDP growth. A coefficient of more than one is an indication of a higher revenue growth than GDP growth (Kusi, 1998; Chipeta, 1998; 2002; Ariyo, 1997; Ayoki, et al. 2005; Murith and Moyi, 2003; Osoro 1993; 1994).

The differences between tax elasticity and buoyancy is that tax elasticity measures the built-in response of revenues to changes in income, while tax buoyancy quantifies the total change in revenue accompanying changes in income. That is, tax elasticity measures the responsiveness of tax revenue without taking into account the effects of discretionary changes in tax policy, assuming that no changes have taken place within the tax structure of the tax system over time. Therefore, the estimation of tax elasticity requires an adjustment to the actual revenue series so as to separate the growth of revenue arising from discretionary changes from that due to automatic changes. Tax buoyancy on the other hand, measures the responsiveness of revenues including changes in the tax system and its estimation does not require adjustments to the actual tax revenue (Creedy and Gemmell, 2001; Kusi, 1998; Chipeta, 1998; 2002; Ariyo, 1997; Ayoki, et al. 2005; Murith and Moyi, 2003; Osoro 1993; 1994; Indraratna, 2003; Steenekamp, 2008).

Therefore, in developing countries such as Tanzania, Kenya and Uganda, where tax policies, tax structure and tax systems have significantly changed, tax elasticity of tax revenue would not provide the best tax revenue performance indicator. Instead, tax buoyancy would be an appropriate measure of tax revenue generation capacity. In light of the above discussion, the

tax buoyancy approach is adopted to evaluate the responsiveness of the tax system in Tanzania, Kenya and Uganda.

The empirical literature on the determinants of tax performance is vast. The most recent studies on this area are Ghura (2002); Teera and Hudson (2004); Khattry and Rao, (2002); Gupta (2007); Steenekamp (2007); Agbeyebe et al. (2006); Davoodi and Grigorian (2007); Baunsgaard and Keen (2005). However, most of these studies have used a static measure of tax performance, the revenue/GDP ratio, rather than examining short-run and long-run dynamic changes taking place in the tax system of a country over time.

Exceptions are studies by Creedy and Gemmell, (2001); Kusi, (1998); Chipeta, (1998); (2002); Ariyo, (1997); Ayoki, et al. (2005); Murith and Moyi, (2003); Osoro (1993); Indraratna, (2003); Begum, (2007). These studies have employed the dynamic indicators of tax performance, tax elasticity and tax buoyancy. A limitation of these studies, however, is that they have used very short time series data. With short time-series one cannot sufficiently capture and separate short-term and longer-term dynamics (Ericsson and Mackinnon, 2002; Baunsgaard and Keen, 2005; Agbeyegbe et al., 2006). This is important because changes in policy reforms may take a long time to materialize and exert potential impacts in the economic system (Blejer and Cheasty, 1990).

These studies have all used more or less the same explanatory variables as determinants of the responsiveness of a tax system. In addition to the level of development of a country proxy by per capita income, level of literacy, communication, extent of urbanization and population size and density, other factors include openness of the economy, structure of the economy reflected by the size of manufacturing/industry, agriculture and informal sector in GDP and the macroeconomic environment reflected by inflation rate, size of the fiscal deficit and the debt size.

Other factors affecting the revenue generating capacity of a tax system include: the administrative and political constraints on the fiscal system, social and political values, indigenous institutional arrangements, popular demand for government spending and other factors which condition overall willingness to pay taxes. Ultimately, the taxable capacity of the country's tax system depends on the willingness and ability of people to pay taxes and the willingness and ability of the government to collect taxes. The willingness and ability of people to pay taxes depends, among other things, on the types of goods and services provided by the government, which varies with the degree of participation of the people acting as citizens (Teera and Hudson, 2004; Steenekamp, 2007).

This paper makes a contribution to the existing literature on tax revenue generation by examining the performance of the tax system using a dynamic index measure of tax performance-the tax buoyancy, and employs a dynamic econometric approach – the co-integration-error correction framework. The novelty of the approach rests on the fact that it distinguishes short-run and long-run tax revenue performance.

3.0 Tax Revenue Generation Capacity in East Africa

Tax revenue performance is evaluated based on the trends of buoyancy coefficients of the different tax categories and the overall changes in total tax. The aim is to trace and evaluate

the changes in the tax buoyancy coefficients over the different policy episodes through which Tanzania, Kenya and Uganda have passed (see Table 1). In addition, the trends in tax buoyancy are compared between the pre-reform and post-reform period (see Table 2), in order to capture the overall changes in the performance of the tax system of the three countries.

It is important to provide a postmortem on the evolution of tax revenue generation capacity in the different policy episodes as this has important implications for identifying effective policy packages and determinants of tax revenue performance. The analysis shows that the performance of the tax system in Tanzania, Kenya and Uganda has been generally improving, though varying over time. Tables 1 and 2 demonstrate this observation. However, overall the analysis shows that tax performance has not been impressive in Tanzania as compared to Kenya and Uganda. It is demonstrated that tax revenue performance in Tanzania has been sluggish though with some slight improvement over time. This is substantiated by the overall tax buoyancy coefficient of total tax revenue and its tax components, which generally are less than one. This suggests that the tax revenue generation capacity of the Tanzania's tax system to changes in the level of economic activity and discretionary tax policy for the period under study has been sluggish.

Overall Tanzania's tax system paints a poor performance; there are some gains in tax revenue performance for some individual taxes and for the tax system. The tax buoyancy of the tax system (i.e. total tax revenue) rose from an average of 0.91 in 1987-92 to 0.98 during the period 1993-95, before it tapered to 0.87 in 1996-2005. This development can largely be attributed to the improved performance of sales and excise taxes (VAT), and income taxes. The support for this observation is linked to increasing buoyancy coefficients of the individual taxes. The buoyancy coefficient of sales and excise tax (VAT) increased from an average of 0.88 in 1970-80 to 0.92 in 1987-92, and rose further to 0.98 in 1993-95, before dropping to 0.87 in 1996-2005. Similarly, the buoyancy coefficient of income tax increased from an average of 0.88 in 1970-80 to 0.92 in 1986-92, and 1993-95, before falling to 0.87 in 1996-2005.

It is also worth noting that during the pre-crisis period the tax system performed better than during the crisis period and post reform period, except for trade taxes. During the pre-crisis period the tax buoyancies for sales and excise taxes (VAT) and income taxes are greater than one, suggesting that during this period the tax system was buoyant. The less than one tax buoyancy for trade tax during the pre-crisis period could be attributable to the fact that during this period Tanzania followed an inward-looking import-substitution strategy and therefore international trade was less important to the country.

Table 1: Trends in Tax Buoyancies in Different Policy Episodes: 1970-2005

Tax Category	Tanzania					Kenya					Uganda			
	70-80	81-86	87-92	93-95	96-05	70-79	80-86	87-91	92-96	97-05	70-79	80-86	87-91	92-05
TXRVB	0.884	0.856	0.914	0.975	0.865	1.031	1.083	1.086	1.081	1.030	1.034	1.104	1.134	1.089
TRTXB	0.961	1.069	0.992	0.998	0.987	0.978	0.963	0.989	0.937	0.977	1.257	1.071	0.918	1.505
VATB	0.863	1.061	0.923	0.854	0.913	1.045	1.175	1.097	1.017	1.086	1.265	1.051	0.980	1.107
INTXB	0.876	0.842	0.915	0.919	0.868	1.131	1.049	1.001	1.160	1.090	1.426	1.129	1.003	1.203
OHTX	0.795	0.813	0.804	0.799	0.796	0.325	0.314	0.213	0.315	0.335	1.523	1.532	1.539	1.529

Notes: TXRV: Tax buoyancy for total tax revenue; TRTXB: Tax buoyancy for trade tax; VATB: Tax buoyancy for sales and excise taxes (VAT); INTXB: tax buoyancy for income tax, OHTX: Other taxes

Unlike Tanzania, Kenya's and Uganda's tax revenue and tax system performances have been impressive for the period under examination. This observation is supported by the increasing trends of buoyancy coefficients of the overall tax system and individual taxes throughout much of the period under investigation as depicted in Tables 1 and 2. That is, the tax buoyancy has improved since 1987-91. There has been a slight decline in the period 1997-2005.

The improvement in the performance of the Kenyan tax system can be seen on the buoyancy coefficient of sales and excise tax, rising from an average of 1.05 in the pre-crisis period to 1.10 during the reform period (1987-91). It then decreased slightly to 1.02 in 1992-96 and rose to 1.09 in 1997-2005. Comparing the performance of the Kenyan tax system between the pre-reform and post-reform periods, Table 1 shows that the Kenyan tax system has been responsive to changes in economic activities. Overall the tax buoyancy improved slightly from 1.05 in the pre-reform period to 1.06 during the post-reform period.

Table 2: Trends in Tax Buoyancies: Pre and Post Reform in East Africa

Tax Category	Pre-Reform (1970-86)	Post-Reform (1987-2005)	Overall (1970-2005
Tanzania			
Tax Revenue	0.8739	0.8979	0.8866
Trade Tax	0.9988	0.9904	0.9944
VAT	0.9324	0.9068	0.9189
Income Tax	0.8641	0.8910	0.8783
Other Tax	0.8012	0.7991	0.8001
Kenya			
Tax Revenue	1.0521	1.0580	1.0552
Trade Tax	0.9719	0.9694	0.9705
VAT	1.1099	1.0706	1.0873
Income Tax	1.0969	1.0847	1.0902
Other Tax	0.3246	0.3314	0.3261
Uganda			
Tax Revenue	1.0832	1.1011	1.0949
Trade Tax	1.1268	1.0561	1.0805
VAT	1.1149	1.0735	1.0878
Income Tax	1.2113	1.1499	1.1711
Other Tax	1.5291	1.5314	1.5306

Overall, the tax buoyancy coefficient for the Uganda's tax system for the whole period under study-1977-2005 averaged at 1.1. That is, the revenue generating capacity of the tax system in Uganda was growing faster than the growth rate of the economy. The figures in Table 1 show that the tax system during the pre-crisis period 1977-79 was buoyant as compared to the crisis period. The tax buoyancy coefficients of all the tax categories and total tax revenue are greater than the buoyancy coefficients during the crisis period. Comparing the performance of the tax categories for the period between 1980 and 1986, the performance is impressive except for sales and excise tax (VAT) and trade tax in which case the tax buoyancy is less than one. Since the period 1980-86 the improvement of the Uganda's tax system performance has been remarkable. In all cases, the tax buoyancy was greater than one throughout the period between 1987 and 2005. It is apparent from the trends of tax buoyancies that there are significant heterogeneities in revenue generation capacity in the three countries. Underlying factors to explain these differences are explored in the following sections.

4.0 Methodology and Econometric Analysis

The tax buoyancy approach is adopted to assess tax revenue generation capacity in this paper. The first step was to estimate tax buoyancy coefficients of each tax and the overall tax system. The double natural log regression approach is used to estimate tax buoyancy coefficients of each tax. Then to assess factors affecting tax revenue generation capacity, tax buoyancy coefficients of the different tax categories and total tax revenue are regressed against factors, which are hypothesized to affect tax revenue performance. The basic estimation equation is specified as follows:

$$b_t = \gamma + \delta_i \mathbf{X}_t + \varepsilon_t \quad (6)$$

Where b_t is the estimated tax buoyancy, X_t is vector of the determinants of tax buoyancy and ε_t is a stochastic disturbance term. Since the objective of this paper is to examine short-run and long-run responsiveness of the tax system for the East African countries, a general autoregressive distributed lag-model is specified as follows:

$$b_t = \gamma + \eta b_{t-1} + \delta_{i1} \mathbf{X}_t + \delta_{i2} \mathbf{X}_{t-1} + \varepsilon_t \quad (7)$$

Estimating equation (7) can generate spurious results when time-series are not stationary. With non-stationary time-series data, the best alternative to explain the dynamics of tax performance is the error-correction model. This involves re-arranging equation (7), which gives the error-correction model:

$$\Delta b_t = \alpha + \delta_{i1} \Delta \mathbf{X}_t + \gamma \varepsilon_{t-1} + \omega_t \quad (8)$$

Where $\gamma = (\eta - 1)$, is the adjustment coefficient (i.e. the estimated coefficient on the error-correction term). The expected value of adjustment coefficient is negative, which implies that there are dynamic stability in the long-run within the error-correction estimation model; $\varepsilon_{t-1} = (b_{t-1} - h\mathbf{X}_{t-1})$, is the error correction term, which can also be obtained directly from the residuals of the co-integration regression equation; and $h = (\delta_1 + \text{---} + \delta_6)/(1-\eta)$.

4.1 Estimation Results

Before proceeding to estimating the error-correction model it is important to test for the presence of unit root and to ascertain whether the variables are co-integrated. This involves, first, determining the order of integration for each of the variables under consideration; this involves differencing each series successively until stationarity of the series are obtained. The second step is to estimate the co-integration regression with ordinary least squares, using variables with the same order of integration. The third is to test for stationarity of the residuals of the co-integration regression. The final step is to estimate the error-correction model.

4.1.1 Unit Root Test

Testing for stationary series, a unit root test is performed for each variable over the 1970 to 2005 time period. In their levels of the series, for some variables (i.e. growth of agriculture for Tanzania and growth of manufacturing and public fiscal deficit for all countries) the null hypothesis of non-stationary of the series is rejected and others with no rejection of the hypothesis of non-stationary of the series at the 1 percent and 5 percent level. For those

variables, which are not, stationary in their levels, after differencing we reject for each series the null hypothesis of non-stationary of the series at 1 or 5 percent levels.

To minimize the possibility of falsely rejecting the true null hypothesis or accepting the null hypothesis, which is false, both the Augmented Dickey Fuller Test (ADF) and Pillips-Perron (P-P) non-parametric test are used to test for the presence of unit root. This is from the fact that ADF test results are sensitive to different lag lengths of the dependent variable, thus biased towards non-rejection of unit roots when structural breaks are incorporated in the data (Indraratna, 2003; Li, 2001). The ADF test is therefore supplemented by the P-P test to confirm for the presence of unit root. The ADF and P-P unit root tests are summarized in Tables 3.

The results show that after taking the first differences most of the variables are integrated of order 1. Other variables are integrated of order 0 (growth of agriculture for Tanzania and growth of manufacturing and public fiscal deficit for all countries) and 2 (growth of urban population for Kenya). Variables integrated of order 0 are also included in the error-correction estimation equation after taking their first differences so that all variables included in the regression are of the same order of integration and for interpretation purposes.

Table 3: Unit Root Tests for the Variables in the Regression Analysis, 1970-2005

Variable	Tanzania			Kenya			Uganda		
	ADF Z(t) Value	PP Z(t) Value	I (?)	ADF Z(t) Value	PP Z(t) Value	I (?)	ADF Z(t) Value	PP Z(t) Value	I (?)
TXRXB	-2.450	-4.779***	I(1)	-4.107***	-8.009***	I(1)	-5.576***	-6.501***	I(1)
TRTXB	-3.552***	-7.085***	I(1)	-2.229	-7.346***	I(1)	-4.867***	-6.063***	I(1)
VATB	5.780***	-4.837***	I(1)	-4.239***	14.914***	I(1)	-4.310***	-6.607***	I(1)
INCTXB	-4.336***	-8.644***	I(1)	-3.148**	-7.234***	I(1)	-4.362***	-7.114***	I(1)
GDPG	-5.234***	-8.886***	I(1)	-6.536***	-7.010***	I(1)	-5.372***	-4.976***	I(1)
INFL	-3.822***	-6.548***	I(1)	-3.782***	-6.099***	I(1)	-3.123**	-4.068***	I(1)
AGRG	-2.294	-5.277***	I(0)	-3.520***	-5.633***	I(0)	-5.226***	-3.886***	I(0)
MANG	-1.474	-5.044***	I(0)	-3.734***	-6.692***	I(1)	-2.766**	-9.011***	I(1)
URBG	-3.009**	-5.635***	I(1)	-2.760**	-5.333***	I(2)	-2.490	-4.850***	I(1)
TRADE	-2.344	-3.668***	I(1)	-4.277***	-6.871***	I(1)	-4.131***	-3.805***	I(1)
GBDEF	-2.958**	-4.028***	I(0)	-3.888***	-5.972***	I(0)	-4.361***	-5.791***	I(0)

Notes: TXRV: Tax buoyancy for total tax revenue; TRTXB: Tax buoyancy for trade tax; VATB: Tax buoyancy for sales and excise taxes (VAT); INTXB: tax buoyancy for income tax, OHTX: Other taxes, GDPG: Real GDP growth rate; INFL: Inflation rate; AGRG: Agriculture Growth rate; MANG: Manufacturing growth rate; URBG: Growth rate of the urban population; TRADE: is the share of trade volume (percentage of import plus export) in GDP; GDEF: the change in public budget deficit

Note: *** = significant at 1% level, ** = significant at 5% level

4.1.2 Co-integration Analysis

Table 4 reports results for co-integration analysis (unit root test for the residuals-the error-correction term). Co-integration regression for each tax category and total tax revenue for Tanzania, Kenya and Uganda respectively are presented in Tables 5, 6 and 7 under column 1. Since more than one independent variable is included in the co-integration analysis, the ADF and PP tests are not appropriate (Mackinnon, 1991). The critical values generated by Mackinnon, (1991) and Ericsson and Mackinnon (2002) are used to test for the stationarity of the residuals from the co-integration regression. The unit root tests for the residuals in Table 4 fail to reject the null hypothesis of non-stationary series, suggesting that the variables are co-integrated. Therefore, we proceed with the final stage of estimating the error-correction model to examine the dynamics of tax revenue generating capacity in Tanzania, Kenya and Uganda.

Table 4: Results of Co-integration Analysis

Equation (Residual)	Without Constant			Without Trend			With Trend		
	Mackinnon Critical Values			Mackinnon Critical Values			Mackinnon Critical Values		
	Z(t)	1%	5%	Z(t)	1%	5%	Z(t)	1%	5%
Tanzania									
TXRV	-4.353**	-4.830	-3.917	-5.909**	-6.025	-5.203	-5.808**	-6.434	-5.581
TRTX	-6.625***	-4.546	-3.685	-5.551**	-5.622	-4.826	-5.447**	-6.050	-5.227
VAT	-6.075***	-4.546	-3.685	-6.010***	-5.622	-4.826	-5.966**	-6.050	-5.227
INTX	-9.003***	-4.546	-3.685	-7.880***	-5.622	-4.826	-7.953***	-6.050	-5.227
OTTX	-6.888***	-5.087	-4.125	-6.754***	-5.482	-4.464	-6.553***	-5.879	-4.808
Kenya									
TXRV	-6.511***	-4.813	-3.912	-6.167***	-6.025	-5.203	-6.089**	-6.434	-5.581
TRTX	-5.425***	-4.532	-3.682	-7.311***	-5.622	-4.826	-7.189***	-6.050	-5.227
VAT	-5.043***	-4.813	-3.912	-5.939**	-6.025	-5.203	-5.952**	-6.434	-5.581
INTX	-5.656***	-4.813	-3.912	-6.821***	-6.025	-5.203	-6.759***	-6.434	-5.581
Uganda									
TXRV	-5.077***	-5.067	-3.977	-5.699**	-6.358	-5.408	-6.070**	-6.826	-5.827
TRTX	-4.774**	-5.067	-3.977	-5.686**	-6.358	-5.408	-5.989**	-6.826	-5.827
VAT	-4.943***	-4.725	-3.736	-4.710	-5.904	-4.998	-5.581**	-6.393	-5.439
INTX	-4.028**	-4.725	-3.736	-5.543**	-5.904	-4.998	-5.494**	-6.393	-5.439
OTTX	-4.492**	-5.067	-3.977	4.386	-6.358	-5.408	4.297	-6.826	-5.827

Notes: TXRV: tax revenue; TRTX: trade tax revenue; VAT: value-added tax (sales and excise tax) revenue; INTX: income tax revenue.

Z(t) *** significant at 1% level, ** significant at 5 % level and * significant at 10 % level, (Critical values at 1% and 5% level of significant are calculated using Mackinnon (1991) and Ericsson and Mackinnon (2002) method.

4.1.3 Error-Correction Estimation Results

Based on co-integration analysis, the error-correction estimation is valid and therefore we can proceed to examine short-run and long-run relationships of the different tax categories and overall tax system and its determinants. The error-correction results for each tax category and the overall tax system are presented under column 2 of Tables 5, 6 and 7 for Tanzania, Kenya and Uganda respectively. The interesting observation to note is the negative and statistically significant coefficient of the error correction term for all the tax categories and overall tax system, with exception of sales and excise tax (VAT) for Tanzania, but it has the expected negative sign. This suggests that in almost all types of taxes, tax revenue tends to move towards the equilibrium as a result of the changes in the variables included in the co-integration regression. A close examination of results in Tables 5, 6 and 7 suggests that there are differences among the three countries, which are worth noting.

The results show that there are short-run and long-run relationships between total tax revenue and growth of GDP, openness to international trade, official development aid as well as total external debt; between trade tax collection and growth of GDP, inflation, openness to international trade and total external debt; and between income tax revenue collection and per capita GDP, inflation, growth of urban population and openness in Tanzania. This is strongly supported by the adjustment coefficients (error-correction term), which in all cases are negative, suggesting short-run and long-run dynamic stability. That is the changes in tax revenue collection from all tax categories are equilibrated by the growth of GDP, changes in the inflation rates, total external debt, official development aid, growth of urban population and the more the country is open to the rest of the world. The coefficients on lagged dependent variables for sales and excise tax (VAT) and income tax are positive and statistically significant. This is an indication that there are partial short-run and long-run adjustments in sales and excise and income tax revenue generation over time in Tanzania.

A close examination at the results also indicate that there exist short-run and long-run relationship between revenue collection in all tax categories as well as total tax revenue and growth of GDP, openness to international trade, official development aid, inflation and growth of the manufacturing sector in Kenya. The existence of dynamic stability is supported by a negative and statistically significant sign of the adjustment coefficients (error-correction term) of total tax revenue and its components. That is in the long-run revenue generation tends to move towards the equilibrium in response to the growth of GDP, and changes in the openness to international trade, official development aid, inflation and growth of the manufacturing sector. The results also show that there are partial adjustments in revenue generation across all tax categories and overall tax system in Kenya over time. This is substantiated by significant positive coefficients on lagged dependent variables in all co-integration regression equations (see Table 6, column 1). There is no evidence for the existence of significant long-run effects of trade reforms on tax revenue generation in Kenya.

The results also demonstrate that there are short-run and long-run relationships between tax performance and growth of GDP, openness to international trade, official development aid, inflation and growth of the manufacturing sector in Uganda. This is substantiated by the significant and negative coefficient of the error-correction term in all tax categories. This implies that in the long-run revenue generation tends to move towards the equilibrium due to changes in the growth rate of GDP, openness to international trade, official development aid, inflation and growth of the manufacturing sector. Coefficients on lagged dependent variables are negative and statistically significant in the co-integration regression for overall tax system and trade tax. This is an indication that there are partial adjustments over time in total tax revenue and trade tax revenue generation in Uganda. It can be noticed from the results that there are no strong evidence to support the existence of long-run effects of trade reforms on tax revenue generation in Uganda.

It is also worth noting significant short-run effects on some of the variables included in the error-correction model. In the short-run, changes in total external debt positively and significantly bolster tax revenue collection in Tanzania. This suggests that with a larger public debt the government is pressurized to collect more revenue in order to service that debt. There seem to be no significant short-run effects of the growth rate of GDP, changes in the inflation rate, growth of agriculture and manufacturing, growth of the urban population, growth of the public budget deficit and greater openness to trade on overall tax performance.

Table 5: Determinants of Tax Revenue Generation Capacity in Tanzania

Variables	Tax Revenue		Trade Tax		Sales and Excise Tax (VAT)		Income Tax		Other Taxes	
	1	**2**	**1**	**2**	**1**	**2**	**1**	**2**	1	2
TAXB1	0.144		0.093		0.544***		0.388**		-0.073	
	(0.78)		(0.57)		(3.58)		(2.29)		(0.40)	
GDPG	0.005	-0.002	-0.002	-0.005*	-0.007	0.012	0.007	-0.003	0.002	0.001
	(0.74)	(0.39)	(0.91)	(1.72)	(0.97)	(1.40)	(1.55)	(0.50)	(0.98)	(0.59)
INFL		-0.002	0.002***	0.002**	-0.001	0.004	0.002*	0.000		0.001
		(0.92)	(2.89)	(2.21)	(0.47)	(1.25)	(1.95)	(0.02)		(1.06)
AGRG		0.002		0.000		-0.015**		0.001		0.001
		(0.37)		(0.07)		(2.00)		(0.24)		(0.82)
MANG		0.003		0.000		-0.004		0.002		-0.001**
		(1.51)		(0.01)		(1.46)		(0.96)		(2.03)
ODA	0.040	-0.035		-0.009		0.025		0.045	-0.016	-0.031*
	(0.87)	(0.65)		(0.40)		(0.36)		(1.04)	(0.99)	(1.97)
EXD	0.031	0.198**	-0.013***	-0.034		-0.031		-0.003	0.069***	0.030
	(0.05)	(2.52)	(2.90)	(0.90)		(0.29)		(0.04)	(3.00)	(1.32)
URBG	-0.019	0.022		0.012	-0.001	-0.048	-0.002	-0.004	0.005	0.021*
	(0.68)	(0.61)		(0.76)	(0.14)	(0.98)	(0.51)	(0.14)	(0.43)	(1.98)
GBDEF		-0.000		-0.000		0.000		0.000		-0.000
		(1.07)		(0.44)		(0.27)		(0.38)		(0.14)
TRADE	0.065	0.155	-0.083***	-0.079*	-0.060	-0.073	0.022	0.004	0.042	-0.013
	(0.80)	(1.50)	(3.89)	(1.67)	(1.24)	(0.51)	(0.74)	(0.04)	(1.36)	(0.43)
TREND									0.014**	
									(2.78)	
ECM_{t-1}		-0.910***		-0.913***		-0.084		-1.009***		-1.038***
		(4.25)		(3.99)		(0.29)		(3.85)		(5.60)
Constant	0.518**	0.036*	1.179***	0.001	0.690**	-0.003	0.411***	-0.007	0.444*	0.012**
	(2.64)	(1.96)	(5.41)	(0.06)	(2.33)	(0.11)	(3.04)	(0.43)	(1.99)	(2.26)
N	33	32	33	32	33	32	33	32	33	32
F-Value	1.31	4.24**	13.31	3.20**	8.39***	1.47	4.07**	2.26*	2.31*	9.19***
Adj_R^2	0.0541	0.5107	0.6580	0.4149	0.5361	0.1309	0.3240	0.2885	0.2228	0.7254

Notes: TAXB1: Tax buoyancy lagged one period; GDPG: Real GDP growth rate; INFL: Inflation rate; AGRG: Agriculture Growth rate; MANG: Manufacturing growth rate; URBG: Growth rate of the urban population; GDEF: the change in public budget deficit; ODA: Natural logarithm of the share of official development aid in GDP; EXD: Natural logarithm of the share of external debt in GDP; TRADE: is the share of trade volume (percentage of import plus export) in GDP; ECM_{t-1}: the residual of the regression of co-integrated variables lagged one period.

Figures in Parentheses are absolute t-values, *** = significant at 1% level, ** = significant at 5% level and * = significant at 10% level

Trade tax revenue collection is statistically associated with the growth of GDP, changes in the inflation rate and trade openness. In the short-run, the growth of GDP seems to discourage revenue collection from trade taxes, as indicated by a negative coefficient. This is expected, because economic theory suggests that as the level of development of the country rises, the importance of trade tax as sources of government revenue diminishes. Therefore, the higher the growth of GDP the less important trade taxes becomes as a source of government revenue.

Table 6: Determinants of Tax Revenue Generation Capacity in Kenya

Variables	Tax Revenue		Trade Tax		Sales and Excise Tax (VAT)		Income Tax	
	1	2	1	2	1	2	1	2
TAXB1	0.484**		0.661***		0.262***		0.481**	
	(2.82)		(3.62)		(3.00)		(2.88)	
GDPG	0.002	0.008	-0.006	0.003	0.000	-0.102	-0.002	-0.002
	(0.38)	(1.02)	(1.45)	(0.55)	(0.06)	(1.50)	(0.31)	(0.24)
INFL	0.002	0.002	-0.000	0.001	-0.003*	-0.002	-0.002	-0.006***
	(0.02)	(1.00)	(0.09)	(0.93)	(1.97)	(1.19)	(0.73)	(3.09)
AGRG		-0.003		-0.001		-0.000		0.003
		(0.78)		(0.27)		(0.00)		(0.73)
MANG	0.003	0.003	0.004*	0.003	0.000	-0.001	-0.000	-0.002
	(1.05)	(0.76)	(1.71)	(1.26)	(0.07)	(0.27)	(0.05)	(0.50)
ODA	-0.077*	-0.092*	0.059**	0.093**	0.066	-0.012	-0.049	0.036
	(1.96)	(1.73)	(2.02)	(2.51)	(1.43)	(0.23)	(0.97)	(0.65)
EXD		0.002		-0.006		0.007		-0.004
		(0.23)		(1.15)		(1.09)		(0.51)
GBDEF		0.000		-0.000*		0.000		-0.000
		(1.33)		(1.85)		(0.86)		(1.16)
TRADE	-0.131	0.101	-0.093	-0.113	0.316**	0.252*	-0.049	0.020
	(1.17)	(0.73)	(1.14)	(1.16)	(2.59)	(1.86)	(1.47)	(0.14)
ECM_{t-1}		-0.539***		-0.651**		-0.358*		-0.815***
		(2.31)		(2.75)		(1.69)		(4.11)
Constant	1.034**	0.001	0.717**	0.003	-0.411	-0.021	-0.308	0.001
	(2.03)	(0.05)	(2.10)	(0.37)	(0.82)	(1.26)	(0.56)	(0.08)
N	34	31	34	31	32	29	34	31
F-Value	2.76**	1.33	4.38**	2.74**	3.49**	1.11	3.15**	3.31**
Adj_R^2	0.2423	0.0889	0.3805	0.3425	0.3252	0.0378	0.2813	0.4093

Notes: TAXB1: Tax buoyancy lagged one period; GDPG: Real GDP growth rate; INFL: Inflation rate; AGRG: Agriculture Growth rate; MANG: Manufacturing growth rate; GDEF: the change in public budget deficit; ODA: Natural logarithm of the share of official development aid in GDP; EXD: Natural logarithm of the share of external debt in GDP; TRADE: is the share of trade volume (percentage of import plus export) in GDP; ECM_{t-1}: the residual of the regression of co-integrated variables lagged one period.

Figures in Parentheses are absolute t-values, *** = significant at 1% level, ** = significant at 5% level and * = significant at 10% level

Inflation displays a positive relationship with trade tax, suggesting that high inflation rates boosts revenue generation from trade taxes. In the short-run openness to trade has resulted to decline in revenue generation from trade taxes. This reflects the significance of the changes that have been undertaken to liberalize trade in Tanzania. Other remaining variables do not show any significant short-run relationship with trade tax revenue mobilization. The growth of agriculture is inversely associated with sales and excise tax revenue generation. This is supported by a significant negative coefficient on agriculture. Results in Table 5 show that most of the variables in the VAT and income tax error-correction regressions had no significant short-run influence of revenue generation. The growth of the manufacturing and ODA show a significant negative correlation with the generation of revenue from other taxes and the growth of urbanization is positively correlated with revenue generation from other taxes in Tanzania.

In the short-run, changes in official development aid inhibit revenue generation in Kenya. This is substantiated by a negative statistically significant coefficient of ODA. A plausible explanation is that grants reduce incentives for government to adopt good fiscal policies and maintain efficient institutions in tax administration. Short-run changes in the government budget deficit and ODA significantly affect trade revenue collection in Kenya. The growth in the government budget deficit negatively affects trade revenue collection, whereas ODA is positively associated with trade revenue generation. Short-run changes in inflation are associated with a decline in income tax revenue generation in Kenya, as indicated by a negative and statistically significant coefficient on inflation. Growth of the urban population and openness to international trade contribute to revenue generation from sales and excise taxes.

Table 7: Determinants of Tax Revenue Generation Capacity in Uganda

Variables	Tax Revenue		Trade Tax		Sales and Excise Tax (VAT)		Income Tax		Other Taxes	
	1	**2**	**1**	**2**	**1**	**2**	**1**	**2**	1	2
TAXB1	0.336*		0.536***		0.122		0.191		0.109	
	(1.61)		(2.31)		(0.59)		(1.21)		(0.62)	
GDPG	0.007**	0.004	-0.021*	0.004	-0.09	-0.009	-0.010*	-0.006	-0.005***	-0.002
	(2.13)	(1.07)	(1.67)	(0.24)	(1.17)	(0.78)	(1.74)	(0.86)	(4.23)	(0.87)
INFL	0.001***	0.001***	-0.002**	-0.002***	-0.002***	-0.002***	-0.002***	0.001***	0.000	-0.000
	(2.87)	(3.79)	(2.91)	(3.79)	(3.28)	(4.07)	(4.57)	(5.15)	(0.59)	(0.97)
AGRG		-0.004		0.010		0.011*		0.004		-0.002*
		(1.47)		(1.16)		(1.61)		(0.95)		(1.72)
MANG	-0.004**	-0.004***	0.012**	0.012	0.005*	0.011***	0.005*	0.008***		-0.000
	(2.48)	(3.33)	(2.12)	(2.68)	(1.60)	(3.08)	(1.96)	(3.73)		(0.28)
URBG	-0.006	-0.027*	0.040	0.048		0.078*		0.044**	0.000	0.010
	(0.53)	(1.90)	(0.82)	(1.12)		(1.97)		(2.04)	(0.07)	(0.15)
ODA		0.032		-0.119		0.027	-0.059*	0.018		0.012
		(0.99)		(0.99)		(0.30)	(1.71)	(0.34)		(0.60)
EXD		-0.090**		0.450***		0.203*		0.102*		-0.016
		(2.35)		(3.34)		(1.85)		(1.60)		(0.61)
GBDEF		0.000				-0.000		-0.000		-0.000
		(0.70)				(1.21)		(0.61)		(0.01)
TRADE	0.068	-0.042*	-0.195	0.216**	-0.239**	0.099*	0.257	0.087**	-0.054*	0.010
	(0.97)	(1.86)	(0.75)	(2.61)	(2.00)	(1.56)	(1.32)	(2.43)	(1.85)	(0.74)
TREND									0.001*	
									(1.70)	
ECM_{t-1}		-0.668**		-0.430*		-0.545**		-0.918***		-1.051**
		(2.69)		(1.78)		(2.44)		(5.15)		(2.45)
Constant	0.495*	-0.061*	1.081	0.301**	1.845***	0.133	1.151***	0.123**	1.547***	0.023
	(1.79)	(1.92)	(0.84)	(2.60)	(3.69)	(1.49)	(5.21)	(2.44)	(4.97)	(1.00)
N	25	24	25	24	25	24	25	24	25	24
F-Value	5.75***	5.77***	5.47***	5.70***	7.16***	5.33***	11.02***	11.80***	3.71**	2.54*
Adj_R^2	0.5427	0.6747	0.5280	0.6478	0.5619	0.6531	0.6761	0.8245	0.4414	0.4017

Notes: TAXB1: Tax buoyancy lagged one period; GDPG: Real GDP growth rate; INFL: Inflation rate; AGRG: Agriculture Growth rate; MANG: Manufacturing growth rate; URB: Growth rate of the urban population; POPG: Growth rate of the population; TAX: Natural logarithm of the share of tax revenue and its components in GDP; GDEF: the change in public budget deficit; ODA: Natural logarithm of the share of official development aid in GDP; EXD: Natural logarithm of the share of external debt in GDP; TRADE: is the share of trade volume (percentage of import plus export) in GDP; ECM_{t-1}: the residual of the regression of co-integrated variables lagged one period.

Figures in Parentheses are absolute t-values, *** = significant at 1% level, ** = significant at 5% level and * = significant at 10% level

The results indicate that in the short-run, increases in inflation rates negatively affect revenue generation from trade taxes, income and sales and excise tax. This is substantiated by negative coefficients of inflation on these taxes. However, the results show that inflation rate has been associated with overall revenue mobilization in Uganda, suggesting compensating shift in the composition of taxes. Strong support is provided by the positive and statistically significant coefficient on inflation with total tax revenue. Results in Table 7 reveal that in the short-run the growth of the manufacturing sector, growth of urban population, openness to trade and total external debt contribute to less revenue generation in Uganda, as indicated by significant and negative coefficients. In the short-run, the results show that the growth of manufacturing, openness to international trade and total external debt bolster revenue collection from trade, income and sales and excise taxes. The positive sign and statistically significant coefficients on these taxes substantiate this.

5.0 Conclusions and Policy Implications

The paper has explored short-run and long-run relationships of revenue generation in Tanzania, Kenya and Uganda. It has questioned the applicability of cross-country regressions, and static empirical studies on tax revenue generation capacity. The findings in this paper confirm this, that revenue generation capacity is not the same in the three countries. It argues that results from this kind of studies cannot be extrapolated to individual developing countries for policy prescriptions. It contributes to the literature on tax performance by applying the co-integration and error-correction modeling framework.

The results demonstrate that tax performance in Tanzania has remained relatively sluggish compared to its counterparts Kenya and Uganda, whose tax performances have been impressive for the period under examination. This could be attributed to the failure of the tax system to generate adequate revenue. A less-than-one tax buoyancy of the overall tax system (total tax revenue) and its tax components substantiates this finding. The results show that there are differences in tax revenue performance among these countries are attributable, at least in part, to variations in their initial conditions. That is, macroeconomic environment, economic structure, level of development and tax administration has been fundamental to overall tax performance in the three countries. For instance, the negative impact of inflation on overall tax system (total tax revenue) in Tanzania can be contrasted to its positive impact in Kenya and Uganda. Similarly, the positive impact of growth of the manufacturing and agricultural sector on revenue generation in Tanzania and Kenya can be contrasted to negative impacts in Uganda.

All three countries have a potential for generating more revenue, if and only if they can address underlying structural weaknesses in their tax systems and their economies as a whole. This is reflected by the negative impact of the growth of GDP and public budget deficit in Tanzania, and of the growth of the manufacturing sector and urban population in Uganda on tax revenue generation, as well as negative impact of the growth of manufacturing sector and GDP on sales and excise and income taxes in Kenya. This is an indication of existence of some structural and institutional problems related to weaknesses and inefficiencies in tax administration and tax collection, and tax revenue leakages due to tax evasion, tax exemptions, non-tax compliance and embezzlement of collected taxes that need to be addressed in order to exploit the full potential of revenue generation.

It is evident from the findings of the empirical analysis presented in this paper that sluggish tax performance and erratic revenue generation in the three countries partly has been due to weaknesses and inefficiencies in tax administration; and tax revenue leakages as a result of pervasive tax exemption, tax evasion, tax avoidance and embezzlement of collected taxes. These countries need to improve tax administration and institute strong legal frameworks in tax management and address structural and institutional weaknesses inherent in their tax systems. Computerization of tax administration and collection; expansion of the tax base by bringing more taxpayers in the tax bracket; addressing problems associated with tax revenue leakages such as abolishing unnecessary tax exemptions and strengthening of tax collection by preventing tax evasion and avoidance, instituting strong legal enforcements in order to punish those engaging in tax evasion, embezzlement of collected taxes and corruption should be at the fore in the ongoing tax reforms in the three countries so as to enhance tax revenue collection. These countries should also focus at providing incentives for the development of the manufacturing sector and commercialization of the agricultural sector, as means for the monetization and raising income and sales and excise taxes as well as trade taxes.

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