



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Domestic Resource Mobilization and Long Term Economic Growth in Tanzania

Chimilila, Cyril.²⁵

Abstract

The objective of this paper is to examine the long term effects of domestic resource mobilization (DRM) on economic growth. This study used macroeconomic data for a period of 20 years spanning 1996 to 2015. By estimating the Autoregressive distributed lag (ARDL) model, Error Correction Model (ECM) and Impulse Response Functions (IRF), the study found that DRM has significant positive long term effect on economic growth suggesting that increased DRM enhances government ability to finance its budget for an enhanced growth. Although the short run effect is negative and statistically significant which indicate distortionary effects of taxes in the short run. Distortionary effects are in one way a result of a tax system that targets few easy to tax individuals and corporations due to a large informal sector. This study recommends enhancement of DRM through expansion of the tax base, tapping more non-tax revenue, and effectiveness in public spending.

Key words: Domestic resource mobilization; long term growth; ARDL model; Tanzania

JEL: H20

²⁵ Lecturer of Economics, Institute of Tax Administration, P.O. Box 9321, Dar es Salaam, Email: cyrilignas@yahoo.co.uk

1.0 Introduction

Debates on the importance of domestic resource mobilization (DRM) for economic growth and development have gained more priority in the recent years. The 2002 Monterrey Consensus on Financing for Development identified DRM as the first of the six financial pillars that would meet MDGs (Runde et al., 2014). Agenda 2063: The Africa We Want put mobilization of the people and their ownership of continental programmes at the core. Adding emphasis, the 3rd Financing for Development meeting in Addis Abba in July, 2015 echoed the importance of DRM as a key part of the international efforts to finance the Sustainable Development Goals (Amoako-Tuffour, 2015). DRM has been perceived vital for long term growth and development as it enhances issues of governance and accountability – DRM solidify ownership over development strategy and to strengthen the bonds of accountability between governments and their citizens (Culpaper and Bhurshan, 2010). Further, high DRM ensures stability in financing development projects as it provides space for development planning and implementation.

DRM provides developing countries a sustainable way of funding development initiatives by paying for their development (Runde and Savoy, 2015) instead of relying on external assistance. This has been evident in the recent past where high aid volatility heavily constrained many developing countries with budget resources to support development initiatives rendering challenges in implementation of vital development initiatives envisaged in their SDG. For the case of Tanzania, over the last 10 years external grants dropped from 5.7 percent of GDP in 2004/05 to 1.2 percent of GDP in 2014/15. This has been attributed to efforts in domestic revenue but also a declining amount of grants received.

Despite the perceived importance of DRM many developing countries are still unable to raise adequate resources domestically due to a number of issues in their taxation systems. The tax to GDP ratio has remained low in low income developing countries as compared to high income developed countries. Tanzania's tax to GDP ratio stands at 12 percent which is lower than average of sub-Saharan Africa countries. Narrow tax base has often been cited as one of the significant factors that lead to low contribution of taxes. In many developing countries the presence of a large informal sector has resulted in a narrowed tax base; typically low income countries depend on taxes from limited number of wealthy individuals. High level of informality and illicit financial flows (such as capital flight) are other significant factor that tends to undermine DRM efforts in developing countries (Amoako-Tuffour, 2015). Capital flight deprives investments for future tax base and growth. Other pertinent issues hampering DRM in developing countries include rampant corruption in the tax system, low compliance attitude among taxpayers, low enforcement due to limited capacity in tax administration, and complex tax legislations which also leave much discretion like in tax exemptions.

High poverty levels are also cited as one of the strong challenges of raising domestic resources in low income countries – this lead to over reliance on external resources such as ODA and FDI (see Bulir and Hamann, 2003; Aryeetey, 2004). Further, low tax effort has been a prominent feature of many developing countries which are endowed with natural resources (see Ndikumana and Abderrahim, 2009). These countries tend to put low priority on tax collection and concentrate of resources rent.

In sum, DRM is the core responsibility of the state for it enables it to perform its mandates. As such DRM should be key undertaking of any state whether developed or developing. Low DRM in developing countries is to a large extent a result of weak state effectiveness. This is

manifested through low compliance levels due to weak enforcement, capacity, and corruption (see Tanzi, 1999; Das-Gupta et al., 2016). As a result of weak state effectiveness, most developing countries focus on ease-to-collect taxes such as trade taxes than taxing incomes.

Like many developing countries, Tanzania has undergone waves of reforms, since mid-1980s, aimed at enhancing DRM. Notably, in 1990s a number of reforms were undertaken in economic structuring and the tax system. For instance, in Tanzania the changes see establishment of an independent tax administration and introduction of VAT in 1996 and 1998, respectively. As well the economy increased liberalized and natural resources extraction (mining sector) peaked up. As a result of these changes DRM has improved considerably. However, there still loop holes both in tax system and resource extraction management that cause rampant revenue leakages (TEC/BAKWATA/CCT, 2012). In the recent, the country is undergoing scrutiny of extraction sector which unveils substantial loss of government revenue.

Much literature exists on the role of DRM on economic growth (Mkandawire, 2001; Moore, 2007; UNCTAD, 2007, North-South Institute, 2008; Runde et al., 2016; World Bank, 2017). But there are limited studies that informs empirically on the effects of DRM on long term growth in particular on the case of Tanzania, a country which has high endowment of natural resources, has undergone significant economic and political reforms, and changes in the tax system in the past few decades. This study thus examines empirically the linkage between DRM in the light of efforts made and their effects on long term growth.

The rest of the paper proceeds as follows. Section two provide the status of DRM in Tanzania and review both theoretical and empirical literature on DRM and growth. Section three provides the methodology used in the study while section four presents findings and discussion of the results, and section five concludes and provides policy recommendations.

2.0 Literature Review

2.1. Status of Domestic Resources Mobilization

Common features of the structure of taxation in developing countries including Tanzania are that tax bases are narrow, taxes are barely progressive, exemptions are widespread, and there is a many of the “hard to tax” (informal) economic activities. These features together create room for rampant tax avoidance and evasion, and a vicious cycle of low tax collection (Amoako-Tuffour, 2015).

According to Kpodar (2016) revenue mobilization has been a long standing concern in Tanzania. As a result of various efforts tax revenue performance improved substantially although the situation is not very impressive. According to World Bank statistics the current tax to GDP for Tanzania stood at 12 per cent which is lower than 16 average of Sub Saharan Africa (SSA). This performance is even well below the average of its comparable peers in East African Community (EAC). Further, the recent upward revision to GDP by about 30 per cent uncovered a lower than previously thought tax-to-GDP ratio. Tanzania’s low tax revenue performance is not due to low tax rates but instead from low tax productivity. Generally, SSA countries have the lowest tax performance; high income countries typically have total tax take as a per cent of GDP of between 25 to 45 per cent, Latin America 22 percent and for East Asia and Pacific 32 percent.

There is no good mix of taxes in most SSA countries. Tax regimes focus mostly on income and profits of targeted taxpayers due to low income base and high informality. Taxes on goods and services (including consumption taxes) contribute substantially but reliance on international trade taxes remains relatively high in most SSA countries. The tax mix is a good indicator of welfare effects of a particular tax. According to ADB (2010), many developing countries have granted many tax exemptions to corporations so that actual corporate income tax revenues remained flat as a share of GDP. A similar pattern prevails in Tanzania (see Table 1) where indirect tax on consumption and trade taxes cover more than 60 per cent of total tax collection. Of the income taxes collected mostly come from employees (PAYE) – corporations contribute less due to, among others, widespread tax exemptions. Tanzania offers extensive tax incentives for companies located in special economic zones (SEZ) and export processing zones (EPZ), including 10-year exemptions (holidays) from income tax, withholding taxes, property tax and other local government taxes and levies (IMF, 2016). Moreover, income taxes from other segments of potential taxpayers (businesses) are largely untapped due to informality, high evasion and administration capacity.

Table 1: Share of Various Taxes to Total Tax Collection in Tanzania 2006/07 to 2015/16

Tax Item	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Income taxes	32.6	31.9	32.4	32.9	33.7	37.0	39.2	40.2	37.0	36.8
Sales/VAT and excise on local goods	22.7	22.2	23.5	22.5	21.1	21.4	21.4	20.9	21.9	20.5
Taxes on imports	43.2	43.8	42.0	42.5	42.8	39.2	37.0	36.7	38.8	40.6
Other taxes	1.4	2.1	2.0	2.1	2.4	2.3	2.4	2.2	2.3	2.2

Source: TRA, National Tax Statistics (2017)

Although tax collection in Tanzania has increased significantly in the recent past, revenue collection has often fallen short of budget targets (Kpodar, 2016). There is wide recognition among policy makers and stakeholders that Tanzania can do better in revenue collection. The IMF (2016) report estimated the average Tanzania’s tax capacity over a period 2009 – 2013 at 15.2 percent of GDP compared to the actual collection of 11.5 percent over the same period, suggests that there is considerable scope to raise tax revenue collection in Tanzania.

2.2. Implemented Reforms for Enhanced DRM Performance

A number of policy reforms were undertaken in the Tanzania economy over the last three decades. Changes implemented between mid -1980s and mid 200s can be summed in two waves of policy changes. The first wave implemented between 1986 and 1995 in response to a weak growth, high inflation, and balance of payments crisis. This episode involved the launch of the Economic Recovery Program in 1986 which lead to a subsequent liberalization of the economy in terms of exchange rate, simplification of export and import procedures, and reduction of tariff and non-tariff trade barriers. These changes see a significant transformation from a largely agrarian based state-controlled economy to a more diversified

(higher value-added manufacturing and services), dynamic, and market-based one (Gigineishvili et al., 2016).

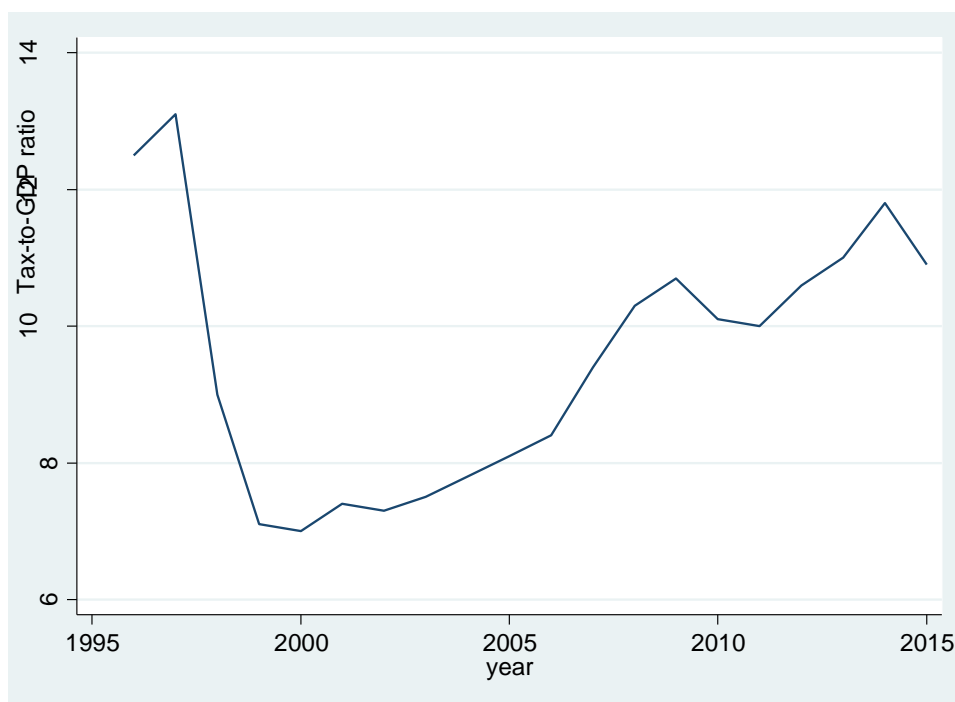
The second and more important wave of reforms began in 1996, with stronger national ownership. This involved a comprehensive privatization program where by 2003 most of the underperforming manufacturing and commercial parastatals were restructured, liquidated, or privatized. However, it is of noting that many large state-owned manufacturing industries which were privatized closed down just after few years – reduced tax base.

During the second wave, fiscal management and revenue mobilization were also improved through tax policy reforms, including the introduction of VAT in 1998, and improved tax administration. Major macroeconomic variables, economic growth as well revenue collection and expenditure performance improved and stabilized. These episodes had significant implications on tax revenue performance. As seen in Figure 1 below, tax performance measured as tax to GDP ratio, declined in mid-1990s before it picked up in early 2000s.

More reforms were also implemented in the recent years. For instance, electronic fiscal devices (EFD) were introduced to improve on administration of VAT, as well mobile money and electronic payment systems which significantly lowered compliance cost and increased convenience. Recent registration of properties is ought to boost government revenue with more potential through implementation of properties valuation. One big challenge to DRM in Tanzania is pervasive evasion, low compliance attitude and civic awareness of the importance of taxation. Taking EFDs as a case in point, despite the government insistence on traders to issues EFD receipts and consumers to demand the same upon buying or paying for a good or services still many traders do not issue such receipts and consumers do not demand them albeit presence of punishments to traders who caught not issuing such receipts.

Despite these efforts still there are more challenges in the Tanzania's tax system. Generous tax incentives undermine the corporate income tax (CIT) base, VAT collection has suffered from creeping exemptions, compliance issues and a weak refund mechanism, and revenue collections from personal income tax remain low, with likely significant underreporting of non-wage income including capital income and gains (IMF, 2016). The overhauling in the new VAT law in July 2015 has to a large extent addressed the problem of exemptions.

Figure 1: Tax to GDP Performance in Tanzania 1996 – 2015



Source: ICTD/UN-WIDER and WDI

2.3. Taxes, DRM and GDP growth

High DRM has been widely acknowledged as an important factor to realizing long term growth. Empirical evidence on the effects of DRM and growth falls in two strands: one strand which emphasize DRM improvement alongside proper utilization of revenue for growth, and the other which contend that growth effect of taxes may be limited by economic distortion it creates. Generally, there is no simple consensus on the issue of taxes and growth.

For instance, McBride (2012)’s paper “What is the Evidence on Taxes and Growth?” presents evidence from notable works looking at the U.S. experience since World War II. These researches show that taxes have no effect on economic growth. They argue that high taxes on corporate taxes and personal income tend to be distortionary, and taxes on consumption reduce savings.

Chye-Ching and Frenz (2014) reviewed over 23 articles on taxation and growth and reported mixed findings where some studies showed “negative” effect on economic growth, while others showed a “neutral” effect and many others conclude that levels of taxation have little if any impact on economic growth. Empirical evidence provided by Skinner (1988) using data from African countries indicated that income, corporate, and import taxation led to greater reductions in output growth than taxes on trade and consumption.

Taxes are withdrawals in the economic system and increasing them tend to lower growth. Thus something more is to be done with increased taxes if they are to bring about positive effects on growth. As Chye-Ching and Frenz (2014) explains, the lack of consensus is due to the fact that the effect of tax increases on growth depends on many different factors, such as the type of tax, the country, the state of the economy, monetary policy, the time frame studied, and what the revenue is used for.

This conclusion by Chye-Ching and Frentz (2014) is even more relevant for a low income developing country like Tanzania. In these countries tax administrations lack adequate resources to function in an efficient manner whereas most of taxpayers have limited capacity to keep appropriate accounts. That has led the tax administration to opt for the least resistant businesses that are easily identifiable (Wangwe and Charle, 2004). As a result they tend to impose high taxes on the incomes of groups that are difficult to evade such as workers, corporations, and on consumption. This act creates economic distortions and is likely to affect compliance, savings and future investment and in turn undermine tax performance (IMF, 2016). Gemmell et al. (2011) argue that taxes on income and profit are most damaging to economic growth over the long run. Barro and Redlick (2011) provide some evidence on this. Using a case of US they argue that a cut in the average marginal tax rate of one percentage point raises per capita GDP by around 0.5%. Similar evidence is from Romer and Romer (2010) who observed that a 1% increase in tax to GDP of US leads to a fall in output of 3% after about 2 years, mostly through negative effects on investment. More resources could be mobilized with little distortions through taxing consumptions and properties than incomes and profits (see McBride, 2012).

Cited in McBride (2012), Alesina and Ardagna (2010) argue about fiscal consolidation and fiscal stimuli. According to them fiscal stimuli through tax cuts are more likely to increase growth than those based upon spending increases. More empirical evidence is provided by the IMF (2010) analysis involving 170 cases of fiscal consolidation in fifteen advanced countries over the last thirty years which show that a one percent spending cut has no significant effect on growth, whereas a one percent tax increase reduces GDP by 1.3 percent after two years.

Given the budget deficit levels it sounds odd to propose tax cuts, say for corporations, in typical developing countries. But these countries have much space for implementing revenue-neutral changes that broaden the base and lower the tax rate through broadening tax base, enforcing compliance, and improving tax administration in addition to curbing revenue loss through corruption and mismanagement of rent extraction from natural resources.

To sum up, achieving a higher DRM is therefore a precondition and not a sufficient condition for realizing sustained economic growth. For an effective result high DRM has to match effective utilization (Wangwe and Charle, 2004). Kpodar (2016) employed data envelopment analysis (DEA) for Tanzania found a significant efficiency gap in public spending efficiency in key sectors of health, education and infrastructure. Thus, unless these issues are addressed higher DRM may not have expected results on growth. Much as empirical studies show a negative effect of taxes on growth it does not mean taxes do not have economic benefits. This same argument is extended in Baro (1990) and Engen and Skinner (1999) that the combined impact of distortionary taxes and beneficial government expenditures may yield a net improvement in the workings of the private sector. In most cases it is very difficult to measure the potential benefits of the spending financed by the revenue collected. These conclusions cement the rationale for an enhanced DRM and improved effectiveness in public spending.

2.4. A Review of Methodologies

The question of how taxes and DRM affect growth has often been addressed in an accounting framework first developed by Solow, 1956 and endogenous growth models of Romer, 1986

and Lucas 1990. The simplest specification used has been using GDP growth as an exogenous variable and tax to GDP and government expenditure as explanatory variables. In order to control for economic growth other variables have been used in models specification including trade, share of agriculture, inflation, exchange rate, investment, government expenditure composition, labour force growth, population growth, education measures, employment, and tax structure (see Engen and Skinner, 1996; Blanchard and Perotti, 2002; Lee and Gordon, 2005).

Specification of models has always pose challenges due to high likely reverse causality between variables of interest. According to Blomstrom, Lipsey, and Zejan (1996) biases of reverse causality creep in because of the way the regression variables are constructed; change in the tax burden, typically measured as the ratio of tax revenue to GDP may be affected by measurement errors in GDP thereby introducing a spurious bias in the estimated coefficient. Another reverse causality problem comes in deciding what factors to include on the right-hand side of a growth regression; factors such as inflation, political unrest, and the share of agriculture in total output could be spuriously correlated with tax policy.

In order to avoid bias introduced by measurement of variables over time and smooth out business cycle effects, some studies have used five-year averages (for example Lee and Gordon, 2005). Given the sample size available, similar manipulation is not possible and this study assume such bias, if any, is small to affect estimation results.

Studies analysing the effects of domestic resource mobilization on economic growth used OLS, panel fixed effect models, and pooled mean regressions based on cross section panels of countries or some single country time series. These techniques do not separate the short and long term effects which is the interest of this study. In order to determine the long run relationship between series that are non-stationary, studies in applied econometrics uses either Granger (1981), Engle and Granger (1987), Autoregressive Distributed Lag (ARDL) cointegration technique or bound test of cointegration (Pesaran and Shin 1999; Pesaran et al. 2001) or Johansen and Juselius (1990) cointegration techniques. This study employs ARDL and ECM models to determine the short and long run relationship between public finances and growth in Tanzania. The ARDL model has been adopted in this study because it offers several estimation advantages. According to Kripfganz and Schneider (2016), unlike the conventional co-integration tests such as the Johansen procedure, the ARDL can be applied regardless of stationarity properties of the variables involved; the conventional co-integration tests are based only on I(1). The re-parameterised ARDL into an ECM model enables estimation of both short and long-run effects of variables of interest.

3.0 Methodology of the study

3.1. Data

Data for this study were sourced from World Bank development indicators (WDI), ICTD/UN-WIDER dataset²⁶, and Tanzania Revenue Authority (TRA). The data covers a period of 20 years (1996 to 2015). This sample represents the most available data for the variables of interest. Moreover, the sample period covers important economic and political events of the country economic liberalization, political transformation, and significant changes in the tax system such as establishment of an independent tax administration (TRA)

²⁶ ICTD/UNU-WIDER, 'Government Revenue Dataset', June 2016, [https://www.wider.unu.edu/project/government-revenue-dataset'](https://www.wider.unu.edu/project/government-revenue-dataset)

in 1996, introduction of VAT in 1998, and changes in the Income tax Act (2004) all these that bear significant short and long term impacts on tax performance and economic performance.

For models estimation, first differences of variables were used in order to capture the effects of changes on DRM and growth. Table 2 presents summary statistics of the data.

Table 2: Description of Variables

Variable	Obs	Mean	Std. Dev.	Min.	Max.
GDP (mil. TSh.)	20	2.71x10 ⁷	2.4x10 ⁷	8552821	8.05x10 ⁷
Gov. Exp (mil. TSh.)	20	6075922	5408016	515389.3	1.78x10 ⁷
Tax to GDP ratio	20	9.5	1.88	7.0	13.1
Openness (mil. TSh.)	20	1.13x10 ⁷	1.04x10 ⁷	1633554	3.29x10 ⁷
Inflation rate	20	9.015	4.63	4.7	21
ODA share of Capital formation	20	47.295	21.43	18.2	82.4

3.2. Econometric tests

3.2.1 Unit root test

Unit root tests were performed in order to test stationary of the data series. The essence of using stationary data for analysis is that non-stationary time series may result into spurious regressions (Johnston and DiNardo, 1997). However, ARDL does not demand variables to be stationary. Unit root tests were performed in order to justify the application of ARDL when the variables are a mix of I(0) and I(1). Stationary tests were performed using both the Augmented Dickey-Fuller (1979) and Phillips and Perron (1988) tests. Phillips-Perron (PP) test relaxes the assumption of homoskedasticity and thus tend to be more powerful than the Augmented Dickey-Fuller test in the presence of heteroskedasticity. Thus, a time series was considered stationary if both tests were significant.

The Augmented Dickey-Fuller (ADF) test is specified as,

$$\Delta y_t = \alpha_0 + \gamma y_{t-1} + \sum_{i=2}^{\beta} \beta_i \Delta y_{t-i} + \varepsilon_t \quad \varepsilon \sim IID(0, \sigma^2)$$

(1)

H₀: $\gamma = 0$ (non-stationary, i.e. unit root)

H₁: $\gamma < 0$ (stationary, i.e. no unit root)

where,

y is a variable tested (e.g. GDP)

ε is a white noise process

γ is the stationarity coefficient

α_0 and β_i are parameters to be estimated

Results of Unit Root test are presented in Table 3. Results indicate that the variables are I(0) and I(1) and thus traditional cointegration tests are not appropriate.

Table 3: Results of Unit Root test

Variable	ADF		Philip Perron		Integrated
	Level	Diff.	Level	Diff.	
D ₁ .GDP	-0.159	-6.119***	0.728	-22.301***	I(1)
D ₁ .GExp	-1.054	-4.026***	-1.561	-14.345**	I(1)
D ₁ .Tax to GDP	-3.012**	-7.586***	-14.519**	-21.291***	I(0)
D ₁ .Openness	-2.622	-5.328***	-10.112	-18.297***	I(1)
D ₁ .Inflation	-4.147***	-5.896***	-15.559**	-18.596***	I(0)
D ₁ .ODA/Cap. Form.	-5.012***	-7.658***	-20.987***	-23.680***	I(0)

Note: *** means significance level $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$

3.2.2 Bounds cointegration test

Since the results of Unit Root test obtained in Table 3 indicates a mix of I(0) and I(1) variables, Bound test of cointegration developed by Pesaran et al. (2001) was used to test cointegration of the variables. Results of Bounds test are presented in Table 4. Results in Table 4 show that the variables used in the model have a long run relationship as indicated by F-statistic greater than critical F-values at $p < 0.01$. The existence of long run relationship between the variables warrants estimation of the ARDL and ECM models.

Table 4: ADRL Bounds Test for Cointegration

F-Statistic = 8.376***					
Asymptotic Critical Values					
P<0.01		P<0.05		P<0.1	
I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
3.41	4.68	2.62	3.79	2.26	3.35

Note: *** denotes statistically significant at $p < 0.01$ level.

3.2.3 Model post-estimation tests

Post estimation econometric tests were performed in order to test homoscedasticity, autocorrelation and specification. The results of these tests are presented in Table 5. The results reject heteroskedasticity as the Breusch-Pagan test was statistically insignificant at $p < 0.05$. Also, presence of a strong autocorrelation was rejected since the Durbin-Watson (DW) statistic of 2.6 indicates weak serial correlation of successive error terms. Presence of strong linear correlation between variables (multicollinearity) was also rejected because the obtained mean VIF value is less than 10. Lastly, statistical insignificance of Ramsey RESET specification test at $p < 0.05$ indicate that the model is correctly specified.

3.3. Analytical models

The long-term relationship between public finances and growth was examined by estimating Autoregressive Distributed Lag (ARDL) model, Error Correction Model (ECM) and Impulse response functions. The appropriate number of lags for ARDL model was determined using Akaike Information Criteria (AIC).

The estimated ARDL(p,q) model is specified as:

$$Y_t = c_0 + c_1 t + \sum_{i=1}^p \phi_i Y_{t-i} + \sum_{i=0}^q \beta'_i \mathbf{x}_{t-i} + u_t \quad (2)$$

where Y is GDP and \mathbf{X} is a $K \times 1$ vector of variables including tax-to-DGP ratio, government expenditure, openness, inflation, and ODA share of capital formation and other variables of interest that control for GDP growth.

The estimated ECM model is specified as:

$$\Delta y_t = c_0 + c_1 t - \alpha(y_{t-1} - \theta \mathbf{x}_{t-1}) + \sum_{i=1}^{p-1} \psi_{yi} \Delta y_{t-i} + \sum_{i=0}^{q-1} \psi'_{xi} \Delta \mathbf{x}_{t-i} + u_t \quad (3)$$

Where the speed of adjustment $\alpha = 1 - \sum_{j=1}^p \phi_j$ and the long-run coefficients $\theta = \frac{\sum_{j=0}^p \beta_j}{\alpha}$.

Impulse response functions (IRF) were estimated in order to describe the evolution of GDP over time due to shocks in the DRM (tax to GDP). Consider a variable of interest, GDP growth, at any time t represented by X_t and a shock in tax-to-GDP at that particular time represented by ε_t . The IRF is a plot of contemporaneous impacts $\frac{\partial x_{t+j}}{\partial \varepsilon_t}$ for all time periods $j = 0, \dots, H$ (where H is the time horizon).

Intuitively, consider a univariate AR(1) process written as;

$$x_t = \phi x_{t-1} + u_t \text{ where } \phi < 1 \quad (4)$$

using lag operator (L) such that $Lx_t = x_{t-1}$ and $L^2 x_t = x_{t-2}$ equation (4) can be rewritten as an infinite moving average representation;

$$x_t = u_t + \phi u_{t-1} + \phi^2 u_{t-2} + \phi^3 u_{t-3} \dots \quad (5)$$

Since the interest is on a structural shocks ε_t , we assume the relationship $u_t = B\varepsilon_t$ and rewrite the above moving average (5) as;

$$x_t = B\varepsilon_t + \phi B\varepsilon_{t-1} + \phi^2 B\varepsilon_{t-2} + \phi^3 B\varepsilon_{t-3} \dots \quad (6)$$

Thus response of a variable x at time t to a shock in time $t+j$ is

$$\frac{\partial x_{t+j}}{\partial \varepsilon_t} = \phi^j B \quad (7)$$

Thus IRF is the graph plotting equation (7) for all time periods j , from $j = 0$ to $j = H$.

4.0 Results and Discussion

4.1. Results of ARDL and ECM models

Results of ARDL and ECM models estimation are presented in Table 5. The results in Table 5 indicate that increase in tax to GDP ratio has a significant positive long run effect on growth. This is because high resources mobilization increases the government's ability to fund expenditure for long term growth. The short run effects are however negative, indicating an increase in tax to GDP ratio reduces economic growth. This may be explained by the structure of taxation which rely on a narrow base thus increasing tax to GDP ratio without substantial increase in the base imply an increased burden which impacts negatively on economic decisions of economic agents and hence affect growth negatively. This study argue that in order to have positive effects both in the short and long run there should be increased efforts to expand the tax base and reduction in tax burden.

Government expenditure has significant positive long term effect GDP growth. Budget execution reports show that government expenditure has grown persistently over the period with more resources increasingly channelled to development expenditure like infrastructure development. However, a large share of these expenditures is still financed through external resources. The volatility of these external resources impacts negatively on long term growth. The results in Table 5 indicate that increased share of ODA on capital formation have negative long term but a positive short term effect; largely due to its volatility.

Results further indicate that openness has a significant positive long term effect on growth. Increased openness implies increased economic activities domestically as well as foreign currency which could be used to fund development projects. The short term results are however negative which may be explained by dominance of imports. The country has to improve on export promotion to ensure sustainable positive effects on trade both in the short and long run. Increase in inflation was found to have positive short run effects but a negative long run effect on growth. Inflation is detrimental to growth but when kept at low levels stimulate economic activities. Over the same period the government has tried to keep inflation rate low, except in few years inflation is maintained at single digit. Thus, in line with enhanced resource mobilization through taxation, fiscal policies should ensure inflation is maintained at low levels.

Results of the ECM model indicate stability as suggested by a significant negative adjustment coefficient. The results show that a 1% increase in a random shock to equilibrium will lead to a 0.794% correction in the equilibrium.

Table 5 Results of ARDL and ECM Models estimation

Regressor	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Long-run Coefficients:						
D1.Gov. Expenditure	1.524315	0.60235	2.53	0.039	0.099983	2.948647
D1.Tax to GDP ratio	1612982	295358.8	5.46	0.001	915469.4	2311395
D1.Openness	1.59358	0.279884	5.69	0.001	0.931758	2.255401
D1.Inflation	-1033679	134486	-7.69	0.000	-1351687	-715669.7
D1.ODA/Cap. Form.	-130600.4	37469.67	-3.49	0.010	-219202.1	-41998.74
Short-run Coefficients:						
D2.Tax to GDP ratio	-629682	255803.6	-2.46	0.043	-1234561	-24802.5
D2.Openness	-0.816402	0.224845	-3.63	0.008	-1.348078	-0.284727
D2.Inflation	295467.2	79234.74	3.73	0.007	108106.9	482827.6
D2.ODA/Cap. Form.	72878.36	24204.34	3.01	0.020	15644.2	130112.5
Constant	-361520.6	317967.4	-1.14	0.293	-1113394	390352.9
ECM(-1)	-0.794779	0.145448	-5.46	0.001	-1.13871	-0.450847
R-Squared	0.897636	Adj. R-Squared	0.7514			
Root MSE	634231.1	Mean VIF	9.37			
DW-Statistic	2.612156	Log likelihood	-257.52			
RESET test (F-Stat.)	5.75	Prob > F	0.0621			
Breusch-Pagan (χ^2)	0.37	Prob > Chi-square	0.5415			

Note: D₁ denotes first difference operator and D₂ is second difference operator.

4.2. Results of Impulse Response Functions Estimation

Results of impulse response functions estimation are presented in Figures 2(a) and 2(b) below. The results show that an increase in tax to GDP has positive effect on GDP growth (Figure 2 Panel (a)). It can be seen from the graph that an increase in tax to GDP ratio by 1% will lead to almost 0.2% increase in GDP growth and the effect persists for about three years and declines gradually before it fades out around the fifth to sixth year. Results in Panel (b) indicate the positive effects of GDP growth on increase in tax to GDP ratio implying that the tax system is elastic to GDP growth.

Figure 2(a): Impulse of Change in Tax to GDP ratio on GDP growth

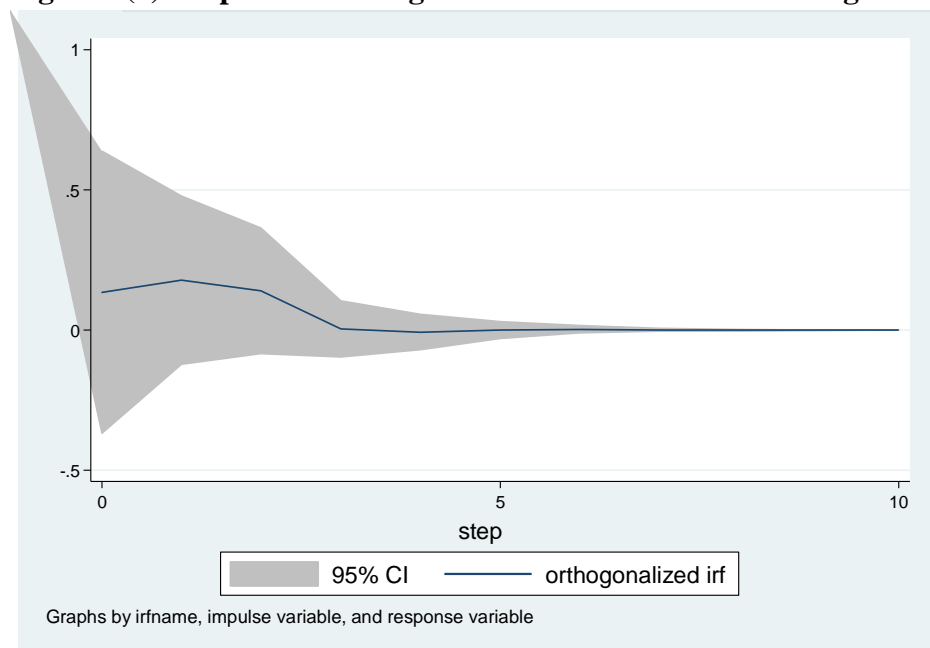
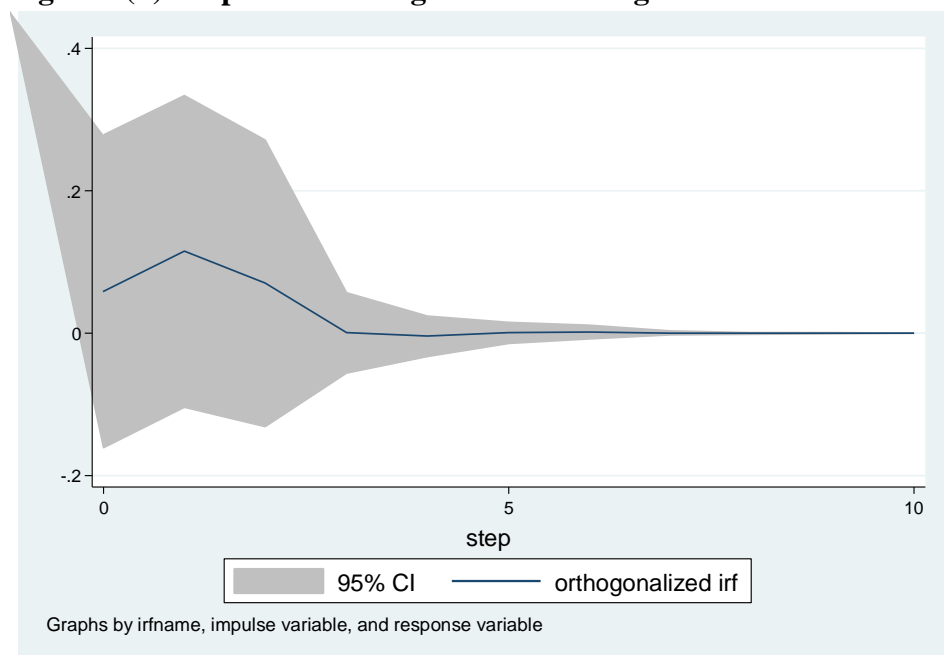


Figure 2(b): Impulse of GDP growth on Change in Tax to GDP ratio



5.0 Conclusion and Recommendations

This paper examines the long term effects of domestic resources mobilization on economic growth. Domestic resources mobilization cannot be emphasized in a developing country like Tanzania which faces persistent budget deficits and shortage of funds to implement important development activities.

This study found a positive long run effect of domestic resources mobilization on growth. The observed effect is linked to enhanced government's ability to finance development activities. Although the study reveals that there is high reliance on few sources for taxes

(trade taxes and income taxes from targeted sources such as corporations and employees). Other income sources are not adequately taxed due to prevalence of a large informal sector. As a result taxes pose a high wedge in the short run that affects growth. More DRM efforts should be directed into inclusion of informal sector into the tax net, improve property taxation, and enhance consumption taxes.

In sum, the study found that both domestic revenue mobilization and government expenditure are important for long term economic growth. Domestic resource mobilization is not a sufficient condition for growth rather a necessary one. Thus, key to achieving long term growth is effectiveness in domestic resources mobilization as well as its proper utilization by ensuring that public spending is directed into priority sectors, strengthen governance to ensure effectiveness of the spending, and enhancement of other sectors that promote growth.

This study recommends an enhanced domestic resource mobilization in a manner that is equitable through inclusion of a larger informal sector into the tax net and exploitation of other untouched revenue sources. Further, it recommends enhancement in mobilization of resources from non-tax sources such as extractives so as to reduce dependence and burden on few sources that are now depended upon. As well, improvements in fiscal governance and continual stabilization of macroeconomic conditions are important for a sustained long term growth.

References

- African Development bank - ADB (2010). Domestic Resource Mobilization across Africa: Trends, Challenges and Policy Options. Committee of Ten Policy Brief No. 2 / 2010.
- Alesina, A. and S. Ardagna (2010). Large changes in fiscal policy: taxes versus spending. In: *Tax Policy and the Economy*, Vol. 24, Univ. of Chicago Press.
- Amoako-Tuffour, J. (2015). Financing for Development: The Call for Action on Domestic Resource Mobilization. African Centre for Economic Transformation (ACET). <http://acetforafrica.org/publication/financing-for-development-the-call-for-domestic-resource-mobilization/>
- Aryeetey, E. (2004). Financing Africa's Future Growth and Development: Some Innovations. Institute of Statistical, Social and Economic Research: University of Ghana. https://www.researchgate.net/publication/241484053_Financing_Africa%27s_Future_Growth_and_Development_Some_Innovations
- Barro, R. and C.J. Redlick (2011). Macroeconomic Effects of Government Purchases and Taxes. *Quarterly Journal of Economics* 126: 51-102.
- Barro, R.J. (1990). Government Spending in a Simple Model of Endogenous Growth. *Journal of Political Economy* 98(5): S103–25.

- Blanchard, O. and R. Perotti (2002). An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output. *Quarterly Journal of Economics* 107: 1329-1368.
- Blomstrom, M., Lipsey, R. E. and M. Zejan (1999). "Is Fixed Investment the Key to Economic Growth?" *Quarterly Journal of Economics* 111(1): 269–76.
- Bulir, A. and Hamann, A. J. (2003). Aid Volatility: An Empirical Assessment. *IMF Staff Papers* 50 (1): 64-89.
- Culpaper, R. and A. Bhurshan (2010). Why enhance domestic resource mobilization in Africa? International centre for Trade and Sustainable development. <https://www.ictsd.org/bridges-news/trade-negotiations-insights/news/why-enhance-domestic-resource-mobilisation-in-africa>
- Das-Gupta, A., Estrada, G. and Park, D. (2016). Measuring Tax Administration Effectiveness and its Impact on Tax Revenue. Economic Growth Centre (EGC), Nanyang Technological University, Discussion Paper No. 2016/01.
- Dincecco, M. and Katz, G. (2012). State Capacity and Long-Run Performance. Berkeley Economic History Laboratory (BEHL) Working paper Series No. WP2013-01.
- Engen, E. And J. Skinner (1996). Taxation And Economic Growth. *National Tax Journal* XLIX No. 4: 617-42.
- Engle, R. F. and Granger, C. J. (1987). Cointegration and error-correction - representation, estimation and testing. *Econometrica* 55 (2): 251-278.
- Gemmell, N., R. Kneller and I. Sanz (2011). The Timing and Persistence of Fiscal Policy Impacts on Growth: Evidence from OECD Countries, *Economic Journal* 121: F33-F58.
- Gigineishvili, N., Jang, B.K. and H. Joly (2016). Productivity, Growth, Structural Reforms, and Macroeconomic Policies in Tanzania. In: United Republic of Tanzania. IMF Country Report No. 16/254, pp. 6-14.
- International Monetary Fund – IMF (2016). United Republic of Tanzania. IMF Country Report No. 16/254.
- Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration - with applications to the demand for money. *Oxford Bulletin of Economics and Statistics* 52 (2): 169-210.

- Johnston, J., and DiNardo, J. (1997), *Econometric Methods*, Fourth Edition, New York: McGraw-Hill.
- Kpodar, R. (2016). Tax Revenue Mobilization in Tanzania. In: United Republic of Tanzania. IMF Country Report No. 16/254, pp. 15-31.
- McBride, W. (2012). What Is the Evidence on Taxes and Growth? Tax Foundation Special Report No. 207 (December 2012).
- Ndikumana, L. and K. Abderrahim (2009). Revenue mobilization in African Countries: Does Natural Resource Endowment Matter? Paper prepared for African Economic Conference on Fostering Development in an Era of Financial and Economic Crises, Addis Ababa, Ethiopia, November 11-13, 2009.
- North-South Institute (2008). Domestic Resource Mobilization: A Neglected Factor in Development Strategy. Background paper prepared for Workshop on Domestic Resource Mobilization in Sub-Saharan Africa Entebbe, Uganda May 27-28, 2008.
- Pesaran, M.H., Shin, Y. and Smith, R. (2001). Bounds Testing Approaches for the Analysis of Level Relationships. *Journal of Applied Econometrics* 16(3): 289-326.
- Phillips P.C.B., Perron P. (1988). Testing for a unit root in time series regression. *Biometrika* 75: 335–346.
- Romer, C. and D. Romer (2010). The macroeconomic effects of tax changes: estimates based on a new measure of fiscal shocks. *American Economic Review* 100: 763-801.
- Runde R., Savoy, C.M. and C.M. Perkins (2014). Taxes and development: The Promise of Domestic Resource Mobilization. Centre for Strategic and International Studies. Washington, DC.
- Runde, D.F. and C.N. Savoy (2015). Paying for Development: Domestic Resource Mobilization. Centre for Strategic and International Studies. <https://www.csis.org/analysis/paying-development-domestic-resource-mobilization>
- Tanzi, V. (1999). Governance, Corruption, and Public Finance: An Overview. In S. Shiavo-Campo (ed.): *Governance, Corruption and Public Financial Management*. Asian Development Bank, pp. 1-17.
- TEC/BAKWATA/CCT (2012). The One Billion Dollar Question: How Can Tanzania Stop Losing So Much Tax Revenue. <http://www.curtisresearch.org/ONE%20BILLION%20DOLLAR%20QUESTION.Final%20text.%20June%202012.pdf>

UNCTAD (2007). *Economic Development in Africa: Reclaiming Policy Space; Domestic Resource Mobilization and Developmental States*. United Nations: New York and Geneva.

Wangwe, S. and P. Charle (2004). *Innovative Approaches to Domestic Resource Mobilization in Selected LDCs*. United Nations Department of Economic & Social Affairs, CDP Background Paper No. 6.
<https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/CDP-bp-2004-6.pdf>

World Bank (2017). *Domestic Resource Mobilization (DRM) and Illicit Financial Flows (IFFs)*. <http://documents.worldbank.org/curated/en/877291492623853466/pdf/IFFs-DRM-Board-Note-Master-vFINAL-04102017.pdf>