REPOA Brief

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Tax Capacity and Effort in Tanzania

By REPOA

Key Messages

Tax Capacity	• **Tanzania is utilizing less than half its potential tax capacity.**
Tax Category	• Not only does the income tax category has more potential than the other tax categories but also has the lowest effort in tax revenue collection. Thus, the country would gain greater mileage by increasing efforts on the income tax category.
	• A large informal sector, a small corporate sector, and tax exemptions are responsible for sub-optimal performance in income tax regime.

Introduction

Tanzania's tax revenue performance has not only been below the expectations of its policymakers but also that of countries with comparable socioeconomic structures. The various tax reforms undertaken in the last couple of decades have not raised tax buoyancy to expected levels.

The main drivers of tax revenue performance in a country are tax capacity and tax effort. The former is the potential tax revenues that can be mobilized given the size of GDP and the structural features[1] of an economy. While the latter is the extent to which actual tax revenue reaches the estimated capacity; it reflects policy choices and the degree of efficiency in policy enforcement (tax administration). Thus, by strengthening tax capacity and improving tax administration there is scope for raising tax revenues above the current levels.

However, since taxable capacity is largely structurally determined, enhancing tax capacity remains to be a medium- to long-term policy objective. In this brief, therefore, we focus on improving tax administration which can yield immediate results by exploring the drivers of domestic resource mobilization, as we seek to assess the scope for options to boost revenues to the desired levels.

Framework of Analysis

The estimation of the revenue potential is based on a stochastic frontier framework whereby, the potential tax-to-GDP ratio for a specified set of inputs and environmental factors can be projected as,

$$T_t/Y_t = f(X_t; \beta) \quad \text{...} \quad (1)$$

Where the left-hand side is the observed tax (T) to GDP (Y) ratio at time t, and on the right-hand side, $T\_t/Y\_t = f(X\_t; \beta)$ is an expression for the production function. It is the maximum tax-to-GDP ratio that could be achieved if policies were fully enforced and there were no random shocks to collections.

But due to inefficiency, tax administrations can only collect a few tax revenues. Thus, equation 1 is being modified into,

$$T_t/Y_t = f(X_t; \beta).\lambda_t \quad \text{..} \quad (2)$$

where λ is the level of inefficiency which ranges from 0 to 1. If λ=1, the tax administration is collecting the optimal amount of tax revenues using the available inputs. As tax collection T is assumed to be strictly positive (T > 0), the degree of technical inefficiency is also assumed to be strictly positive (λ > 0), and the inefficiency effect of λ is to lower the tax collection from its potential level.

Tax revenue collection is also affected by random shocks, implying that,

$$T_t/Y_t = f(X_t; \beta).\lambda_t.e_t \quad \text{...} \quad (3)$$

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1 Tax capacity is structurally determined by the stage of economic development, the size of the informal sector, sectoral composition, and so on.

where, *e* represents random shocks, reflecting factors such as one-off windfalls, as well as measurement errors, and model misspecification.

Assuming that $f(X\_t; \beta)$ is linear in logs, that j inputs are defining the country's tax base, and defining $u_t = -\ln\lambda_t$, tax effort can be derived as the ratio between actual tax revenue and the stochastic frontier tax revenue as follows:

$$TE = [\ln(T_t/Y_t) = \beta_0 + \sum_{(i=1)}^{j} \beta_i \ln X_t + e_t - u_t] / [\ln(T_t/Y_t) = \beta_0 + \sum_{(i=1)}^{j} \beta_i \ln X_t + e_t = -u_t \dots (4)$$

Variables Used and Sources of Data

The tax bases used for the different tax categories are GDP per capita (real values, natural log) for aggregate tax revenues, non-agriculture GDP per capita (real values, natural log) for income taxes, final consumption as % of GDP for VAT and Excise taxes, and total imports as % of GDP for import duties.

There is general agreement in the literature that a country's revenue potential is contingent upon a set of economic, demographic, and institutional factors; with 'effort' capturing factors more immediately under government control (Langford & Ohlenburg, 2015). After performing multicollinearity tests to identify and eliminate explanatory variables with high correlation, the explanatory variables used, their expected sign, and how they were categorized in the model are reported in Table 1.

Table 1: Variables used and sources of data

Variable	Source	Expected sign	Category in model specification		
			x	zp	ze
Dependent variable					
Tax GDP ratio	MOFP, BOT				
Economic factors					
GDP per capita (real values, natural log)	WDI	+	x		
Non-agriculture GDP per capita (real values, natural log)	MOFP, BOT	+	x		
Final Consumption % GDP	WDI	+	x		
Imports as % GDP	BOT	+	x		
Manufacturing as % GDP	WDI	+	x		
Agriculture as % GDP	WDI	-	x		
Inflation	BOT	-		zp	
2-years lag External Debt % GDP	BOT	+	x		
2-years lag Dev. Exp. % GDP	BOT	+	x		
Recurrent Exp. % GDP	BOT	-			ze
Demographic factors					
Age dependency ratio	WDI	+			ze
Institutional factors					
Control of Corruption index (100=less corrupt)	TI	+			ze

Notes: zp and ze are observable environmental variables that are not direct inputs into tax collection, but that influence potential tax capacity (zp) or the level of effort (ze). MOFP = Ministry of Finance and Planning, BOT = Bank of Tanzania, WDI = World Development Index, TI = Transparency International

Results and Discussion

Determinants of Potential Tax Revenues

Using annual data for the period between 2000 and 2020, the stochastic tax frontiers for the various tax categories were estimated using a time-varying decay model, and the results are presented and discussed below:

For the aggregate tax revenues, the coefficient for the tax base is statistically significant and has the right (positive) sign. Thus the country experiences an increase in potential tax revenues, with an expansion in its taxable base. The coefficient for external debt is statistically significant but has an unexpected (negative) sign. Thus, an increase in external debt reduces the aggregate tax potential. This result may arise when the external loans are largely concessionary and seen as grants which introduce disincentives to domestic revenue mobilization. In this context, external loans are considered an alternative to domestic revenues.

The environmental factors that influence the level of tax effort are consistent with expectations. The coefficients for age dependency and the share of recurrent expenditures to GDP are statistically significant and have the right signs-positive for age dependency and negative for recurrent expenditures. The results confirm that: (a) Taxpayers are willing to pay taxes to support increased public expenditures, and (b) Taxpayers are more willing to pay taxes to finance activities that they can easily associate results with.

For the income tax category, the coefficients for the tax base and external debt are statistically significant and have the right signs. Thus, the potential income tax revenues rise with an expansion in its taxable base, the non-agricultural GDP per capita. However, contrary to the aggregate tax revenues, external debt impacts positively on income tax potential, suggesting that the loans are used to finance pro-growth activities that enhance the income tax frontier. It also suggests that the tax authorities would normally increase efforts to collect income taxes to service public external debt in the future.

The environmental factors are not so critical to income taxes. This may be an important distinguishing feature between direct and indirect taxes[2], a subject for further research.

For the value-added tax (VAT) category, the coefficient for the tax base is statistically significant but has an unexpected (negative) sign. Indeed, over the 21 years (2000-2020), the VAT tax base (aggregate final consumption as percent of GDP) declined practically consistently from 84.9 percent to 65.9 percent while the VAT revenue to GDP fluctuated between 2.8 and 4.5 percent. Thus, as the base was eroding, tax authorities applied pressure to raise more VAT. The coefficient for manufacturing output is statistically significant and has the right sign. Thus, the growth of manufacturing output supported the expansion of the VAT frontier. Age dependency, however, has a negative relationship with the VAT-GDP ratio which may reflect the lack of taxpayers consciously relating tax compliance with public service, specifically health and education; that high dependency is more likely to constrain growth and consumption, thus shrinking the tax frontier[3].

For the excise tax category, the coefficients for the tax base and the development expenditure are statistically significant and have the right (positive) signs, implying that both variables support the growth of excise tax capacity. This implies that excise taxes in the country target goods and services that are luxurious or socially destructive and are therefore progressive and tax frontier enhancing. Further, the visibility of the impact of government investment expenditure is expected to increase the willingness of taxpayers to pay taxes. External debt on the other hand reduces tax effort and works to shrink the tax frontier.

However, the coefficient for the recurrent expenditure is statistically significant and has the right (negative) sign, implying that tax revenue shares are expected to reduce with increases in government consumption expenditures.

For the import duties category, the tax base (imports as percent of GDP) does not support the expansion of the tax capacity. This finding may be explained by the declining trend of imports in recent years as well as the regional trade protocols which have systematically reduced import duty rates to support the movement of goods among member-states. The coefficient for manufacturing output is statistically significant, with a negative sign, suggesting that increased manufacturing output does not support the expansion of the tax frontier. This may be an outcome of a policy decision to adopt low or zero rates for intermediate and capital goods imports (which account for around 75% of the imports), in addition to exemptions granted through TIC. Government Investment (development) expenditures, on the other hand, create opportunities for further growth and support the expansion of tax capacity.

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2 Direct taxpayers, not directly linked to households, are less likely to be emotionally driven by environmental factors compared to indirect taxpayers who are generally a part of the households and local communities.

3 In this case, age dependency works as an environmental factor that influences tax capacity rather than tax effort.

The coefficients for age dependency and recurrent expenditures are significant and have the right signs. The coefficient for the control of corruption is significant but has an unexpected sign. Thus, efforts to control corruption play a negative role in supporting import duties revenue mobilization.

Tax Capacity and Tax Effort

Table 2 reports the efficiency levels of the tax categories. At the aggregate level, the country is utilizing less than half its tax potential, which is 11% against 24% of GDP. The tax category with the highest level of efficiency is VAT[4]. The tax category with the lowest level of efficiency is the income tax. This may be due to its widely untaxed tax base[5].

Table 2: Average of Tax effort, Potential tax ratio, and Actual tax ratio per category

Categories	Tax effort	Potential tax ratio	Actual tax ratio
Excise duties	46.870	3.717	1.730
Import duties	35.484	2.599	0.930
Income taxes	12.107	30.019	3.523
VAT	96.204	3.696	3.538
Tax revenues	47.081	23.632	10.973

Source: Authors' computation

The results show clearly that greater mileage would be gained by focusing efforts on the income tax category. This source, which accounted for 36% of the country's tax revenue during the last decade, not only has the highest potential (30% of GDP) but experiences the lowest tax effort level (12% of GDP).

Concluding Remarks

Growing the tax base is key to enhancing the tax frontier of the aggregate tax system generally and the specific tax categories. The impact of external debt, generally considered to help enhance the tax frontier through its positive impact on infrastructure development, is diminished by the concessionary influence on tax effort. As expected, public consumption reduces the willingness of taxpayers to pay taxes whose results they cannot explicitly relate to.

The stochastic tax frontier analysis shows that the country is utilizing only about 47 percent of its tax efforts potential. The results also show that greater mileage would be gained by focusing efforts on the income tax category. This source, which accounted for 36% of the country's tax revenue during the last decade, not only has the highest potential (30% of GDP) but experiences the lowest tax efficiency level (12% of GDP). Efforts to bring into the tax net the informal sector, to expand the (private) corporate sector, and to reduce exemptions would go a distance in enhancing the income tax base.

References

Langford, B., & Ohlenburg, T. (2015). Tax revenue potential and effort. International Growth Centre Working Paper.

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4 This may be due to its regressivity during the period of declining consumption.
5 A large informal sector, a small corporate sector and tax exemptions constitute a good recipe for a non-performing income tax.

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