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AN ANALYSIS OF TAX EFFORT AND TAX INCIDENCE IN NAMIBIA AND SOUTH AFRICA

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Abstract

Most Sub-Saharan African countries (SSA) have shown excessive dependence on foreign financing which with time, has led to financial debts and sustainability. Also, most Sub-Saharan African (SSA) economies have had to look for methods to increase tax revenue that will be able to fund public expenditures and ultimately narrow the shortage. A key factor for economic development in most developing economies is an effective tax system. The study used time-series data for thirty-six years from 1980 to 2015, collected from published economic reports and World Development Indicators Report (2016) with various measures. This study uses data for Namibia and South African countries from 1970-to 2015 to compare the tax ratios and to build an index of tax effort for the two countries. The index of the tax effort is constructed as the ratio of the actual tax share to the predicted (or potential) tax share. Results indicated that in Namibia, services value added % of GDP was statistically significant at 5 %. Also GDP per capita was significant at 1% level of significance. In South Africa export share % of GDP was significant at 5% level of significance while GDP per capita was significant at 10% level of significance. The export share seems to have a strong and direct relationship with tax share. The study concludes that establishing the tax effort index, according to the actual revenues of a country to its estimated taxable amount, gives us a tempting quantity that determines countries specific fiscal, institutional and demographic traits.

Keywords: Tax system, tax revenue, tax effort, actual tax share, tax incidence, tax revenue

INTRODUCTION

Background of the Study

Most Sub-Saharan African countries (SSA) have shown excessive dependence on foreign financing which with time, has led to financial debts and sustainability (Bird, 2008). Most SSA countries are increasingly focused in enhancing local resource mobilization to cope with their growing budgets, ensure fiscal sustainability, and set a favorable economic environment to avert this challenge. With budget deficits dramatically growing in a lot of countries due to the introduction of large incentive packages to endorse economic growth, most Sub-Saharan African (SSA) economies have had to look for methods to increase tax revenue that will be able to fund public expenditures and ultimately narrow the shortage, minus the altering of economic activities (Osoro, 1993).

As has been argued by most economists, a key factor for economic development in most developing economies is an effective tax system. According to Le *et al.* (2012), most developing countries are commonly characterized by its significantly lower tax to gross domestic product (GDP) ratio. In most SSA countries, the economy's structure, political setup, institutional capacity, tax morale, level of economic development, or tax culture affect their tax system (Le *et al.,* 2012; Bird, et al., 2006)

Generating sufficient funds for public use through revenues has been very difficult for many developing countries (KIPPRA, 2006). In sub-Saharan African countries, funds for the budgets in the public sector are chronically inadequate and the fruitless use of its expenditures have led to a limit in investments that are critical in both human and capital infrastructure, which is essential for providing a foundation for sustainable economic growth. This study uses data for Namibia and South African countries from 1970-to 2015 to compare the tax ratios and to build an index of tax effort for the two countries. The index of the tax effort is constructed as the ratio of the actual tax share to the predicted (or potential) tax share.

Revenue performance in Namibia and South Africa

Revenue performance varies across the two countries. The average share of tax revenue in GDP was 23.24507182 for Namibia and 22.71052826 for South Africa. From fig 1.1, since 1980, the share of tax revenue to GDP for South Africa has been above 20%, but in Namibia, the 20% mark was only hit in 1986. Revenue trends vary in sub-Saharan African countries. Namibia, from 1990 has enjoyed sustained increases in tax revenue share but higher than what south Africa enjoys. There is evidence that on average tax revenue shares are starting to strengthen. According to Tanzi (1992), in industrialize countries tax shares tend to be higher than in your countries.

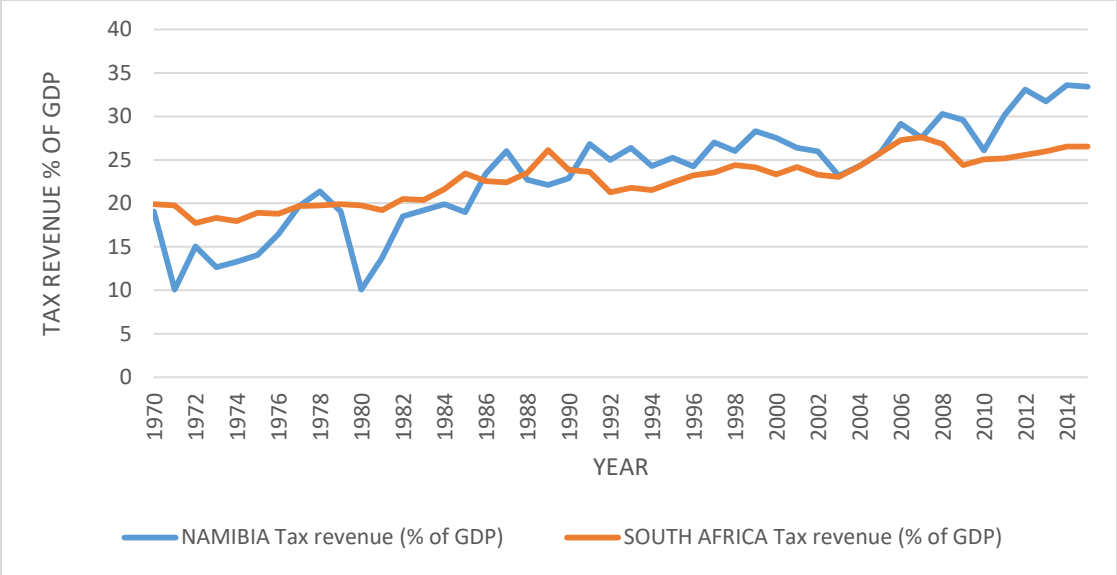

Figure 1: Tax Share as a percentage of GDP (Source: Ghura, 1998).

Objectives of the Paper

The core objective of the paper is to evaluate and show graphically the trends in tax ratios for two Sub-Saharan countries namely Namibia and South Africa. However, as built to address this objective, the paper explains the concept of tax effort in relation to a developing economy.

LITERATURE REVIEW

Determinants of Tax Shares/Ratios

Differences in the economic and political structures in the Sub-Saharan African countries, arises numerous reasons for their relatively low shares of tax revenue in GDP. The markets of these countries are challenging to tax due to a low per capita income and being built on subsistence agriculture. The public sector is often easier to tax and is limited to certain large-scale plantations producing agricultural yields for export, petroleum and mineral extraction, a number of large manufacturing enterprises, and small-scale manufacturing and retailing. The degree to which the formal sector purchases from the informal sector may well impair the administration's tax system (Wawire, 2000). South Africa has gone through severe unrest (xenophobia), which also has impaired the revenue collection. There being a number of large unproductive state-owned enterprises, insufficient number of large private sector taxpayers and hesitance in tax collection from elites also limits revenue collections.

Aside from the general political and economic weaknesses, Most of the Sub-Saharan African countries have compromised the efficiency of resource provision in the economy and

incentives for development and has ultimately limited the ability of tax revenues to go up (Ghura, 1998). These flaws are apparent in all parts of the tax system. International trade taxes typically characterized by excessive number of nominal tariff rates and several exemptions, resulting in a significant dispersion in an effective protection rate. Custom structures put to protect industries tend to lower motivation leading to inefficient production and limited economic growth. Marketing boards responsible for its employees pay farmers below-market value for crops may impose substantial implicit taxes that are not documented as tax revenue. Furthermore domestic taxes are poorly structured in the two countries. Indirect taxes, like the value-added tax often have multiple rates, apply to only some sectors, and have a wide-range of exemptions.

Together with poor tax structures, the two countries have weak custom and tax administrations that impair the determination to raise tax revenues. Basically, in these two countries, there is an excessive number of inexperienced and poorly supervised staff in the tax customs administrations, low salaries, bad management practices, and lack of equipment and supplies. Tax custom fraud and corruption become more common due the weak legal structures despite the induction of custom laws (Ghura, 1998).

However, South Africa in recent years has improved majorly in its tax system. For instance, it has commenced a comprehensive program of change of both administration and tax policy, this has also led to an increase in the tax share to GDP ratio.

RESEARCH METHODOLOGY

Comparison of Tax Effort

There are several purposes of comparing tax effort; one is by revealing whether there is limited revenue collections in a country by its low capability to generate revenues or if it is due to the reluctant usage of the available tax capacity to finance public services. The other is to provide direction to the appropriate mix of fiscal policy undertaken as a result of budgetary imbalance. If there is still imbalance in the country even after its taxable capacity has been maximized this would imply that the correction of this imbalance would need expenditure reductions instead of increase in taxes (Musgrave, 1987).

There are two ways to compare tax effort in a country. These comparisons are founded on the differences in the ratio of taxes to measures of the tax base of the GDP. This method assumes that the tax base which is used for the comparisons is a correct measure of taxable capacity. A simple tax base like the GDP is typically not sufficient as a measure of taxable capacity, because all taxes are not entirely linked explicitly to revenue, and the allocation of income and how it is earned also affects taxable capacity (Njoroge, 1993).

The first approach measures taxable capacity by regressing for a sample of countries the tax revenue to GDP ratio on illustrative variables which serve as alternatives for possible tax bases and other elements that might affect a country's aptitude to raise tax revenues. This approach has been used in industrialized and developing countries (Tanzi, 1992; Bahl, 1971; Lotz & Morss, 1967). Through this regression approach, the expected tax ratio is looked at as a measure of taxable capacity while its coefficients are deduced as average actual rates on those bases. The ratios are then computed and finally used the index for tax effort (Choudhry, 1979).

An alternate method is to take a sample of countries and calculate the average effective tax rates then apply them to a standard set of tax bases for the same countries, this measures tax that is collected when a country applies for a standard tax rate to a standard set of tax bases. The ratio of the actual yield to the standard tax yield is used as a substitute to tax effort (Chipeta, 1998).

There are both similarities and differences in the two general approaches. In each case, tax effort is well-defined as the ratio of tax revenues to some measure of taxable capacity. They argue that tax bases and other illustrative variables reflect differences only in taxable capacity and not tax effort. It is also unlikely that tax bases and other economic features do not reflect the demand for public expenditure so as to not make the measure one of the tax capacity. Another difference of the regression approach is that it basically controls the measure of taxable capacity for other factors apart from tax bases while the average tax system approach does not, which is in fact an advantage.

Data and Variables Used

To attain the objective of this study, time-series data for thirty-six years from 1980 to 2015 were collected from published economic reports and World Development Indicators Report (2016). Data was collected on total tax revenues, Gross Domestic Product in Local currency units, Manufacturing value added (% of GDP), export share (% of GDP), Import share (%of GDP), Agriculture value added (% of GDP), Mining value added (% of GDP), manufacturing value added (% of GDP), services value added (% of GDP) and industry value added (% of GDP). In this study, the sectorial composition of value-added is used, because they are likely to be an significant factor that influences the tax share as some sectors are more open to taxation and produce tax surpluses. In developing countries, a substantial determinant of tax is the share of agriculture in its economy (Sen Gupta, 2007). The share of universal trade in the economy is a clear measure of trade openness. The international trade is typically the most monetized sector in economy in developing countries (Moyi & Ronge, 2006; Muriithi, et al., 2003). Entering and exiting in a country happens in specified places. Thus import or export

shares become a substantial determinant of tax share. Owing to data restrictions for some independent variables, the study period was reduced from 1970-2015 to 1980-2015.

The Regression Model

This study uses regression analysis in its investigation on the determinants of tax effort in South Africa and Namibia. The benefit of using the two countries is that they tend to have similar economic characteristics, though there are many political and social differences. Tax to GDP ratio was given by the following general relationship equation 1.1

$T = f(M, S, \text{MR}, E, I, A, \text{GDP}_{\text{PC}})$.....1.1

Where T=tax revenue % of GDP

M=manufacturing value added % of GDP

S=services value added % of GDP

MR=mineral rents % of GDP

E=share of exports in GDP

I= share of Imports in GDP

A= agriculture value added % of GDP

GDP_PC=GDP per capita

For the two countries a multiple linear regression analysis was performed where the equations were specified as in equation 1.2

$T = \beta_0 + \beta_1 S + \beta_2 M + \beta_3 \text{MR} + \beta_4 E + \beta I + \beta_6 A + \beta_7 \text{GDP}_{\text{PC}} + \varepsilon$.....1.2

Where β_i are the coefficients to be estimated, other variables are as defined in equation 1.1

This study uses the regression approach where the tax revenue to GDP ratio is regressed on several explanatory variables that serve as substitutes for possible tax bases. the regression approach is that it basically controls the measure of taxable capacity for other factors apart from tax bases while the average tax system approach does not, which is in fact an advantage.

The regression approach has been used in several countries (Tanzi, 1992; Chelliah, Baas, & Kelly, 1975). The predicted tax ratio from the regression can be interpreted as a measure of taxable capacity while the regression coefficients can be interpreted as average effective rates for those bases. These tax ratios were computed from the output of the regression equation 1.2. The ratio of the actual to the predicted tax ratios is then computed and used as an index of tax effort.

EMPIRICAL RESULTS

Table 1: Regression results for Namibia

Dependent Variable: TAX_REVENUE
Method: Least Squares
Date: 02/02/17
Time: 17:34
Sample: 1980 2015
Included observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SERVICES	0.279859	0.115344	2.426289	0.0219
MINERAL_RENTS	0.020070	0.047587	0.421763	0.6764
MANUFACTURING	-0.077058	0.267978	-0.287554	0.7758
EXPORT	0.025764	0.099341	0.259352	0.7973
IMPORT	-0.014785	0.062723	-0.235725	0.8154
AGRICULTURE	0.541149	0.390617	1.385372	0.1769
GDP_PC	0.000217	3.45E-05	6.282215	0.0000
C	0.545695	11.29230	0.048324	0.9618

R-squared	0.820232	Mean dependent var	25.55962
Adjusted R-squared	0.775289	S.D. dependent var	4.290851
S.E. of regression	2.034020	Akaike info criterion	4.451035
Sum squared resid	115.8426	Schwarz criterion	4.802928
Log likelihood	-72.11863	Hannan-Quinn criter.	4.573855
F-statistic	18.25084	Durbin-Watson stat	1.415274
Prob (F-statistic)	0.000000		

The regression results shows that services value added % of GDP was statistically significant at 5 %. Also GDP per capita was significant at 1% level of significance. This implies that services and GDP per capita were the only variables that influenced the tax ratio in Namibia. These outputs were used to generate the predicted tax ratios to be used to calculate the tax effort.

Table 2: Regression Results
for South Africa

Dependent Variable: TAX_REVENUE
Method: Least Squares
Date: 02/02/17
Time: 17:21
Sample: 1980 2015
Included observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SERVICES	0.143758	0.152190	0.944593	0.3529
MINERAL_RENTS	-0.282042	0.240711	-1.171705	0.2512
MANUFACTURING	0.450365	0.377168	1.194070	0.2425
IMPORT	-0.064653	0.098694	-0.655089	0.5178
EXPORT	0.307600	0.115272	2.668476	0.0125
AGRICULTURE	-0.090398	0.678702	-0.133192	0.8950
GDP_PC	9.20E-05	4.86E-05	1.891402	0.0690
C	-1.824017	16.74134	-0.108953	0.9140
R-squared	0.718059	Mean dependent var		23.72096
Adjusted R-squared	0.647574	S.D. dependent var		2.133289
S.E. of regression	1.266437	Akaike info criterion		3.503423
Sum squared resid	44.90819	Schwarz criterion		3.855316
Log likelihood	-55.06161	Hannan-Quinn criter.		3.626243
F-statistic	10.18736	Durbin-Watson stat		0.901619
Prob (F-statistic)	0.000003			

As presented in the table 2, in South Africa export share % of GDP was significant at 5% level of significance while GDP per capita was significant at 10% level of significance. The export share seems to have a strong and direct relationship with tax share.

Table 3: Trends in Tax effort

Year	EFFORT_NAM	EFFORT_SA
1980	0.909969163	0.976877196
1981	0.969066676	0.930509629
1982	0.912476337	0.97692372
1983	0.928265558	0.984464451
1984	0.931626343	0.983006397
1985	0.937176329	1.044309421
1986	1.123136313	1.005017498
1987	1.157017609	0.97948713
1988	1.005577128	1.029568512
1989	0.996384423	1.137960852
1990	0.991332268	1.045547365
1991	1.101859083	1.059701123
1992	1.049917774	0.949140911
1993	1.072523745	0.96829979
1994	0.961052829	0.973073985
1995	0.974298647	0.984028775
1996	0.913745985	1.005464674
1997	1.032673241	1.01028788
1998	1.001364491	1.035908078
1999	1.060728854	1.026168552
2000	1.046478188	0.954213603
2001	1.037366154	0.961972427
2002	1.008861821	0.897581907
2003	0.866306049	0.922405637
2004	0.905212287	0.983859537
2005	0.930467412	1.031574895
2006	1.092401116	1.088751948
2007	1.017640387	1.083696526
2008	1.124447317	1.018688794
2009	1.026865659	0.980244799
2010	0.869092944	1.000290357
2011	0.991614522	0.993108074
2012	1.062963119	1.00576312
2013	0.993080772	1.000358751
2014	1.004549056	0.987604801
2015	0.97669371	0.981122851

The results show that the minimum tax effort index was 0.8663 for the year 2003, and the maximum was 1.1570 for 1987 in Namibia. On the other hand, the maximum and minimum tax efforts for South Africa were 1.1379 and 0.8975 for the 1989 and 2002 respectively. In Namibia eighteen years out of the thirty six had tax effort less than unity, and the other eighteen years tax effort was greater than unity. This finding implies that, for the study period, Namibia has been over taxed for eighteen years and under taxed for same number of years. In South Africa, nineteen years out of the thirty six had tax effort less than unity, and the other seventeen years tax effort was greater than unity. This finding implies that, for the study period, South Africa has been over taxed for twenty years and under taxed for sixteen years. From the figure, there is no clear trend depicted for the two countries tax effort. Graphically the tax effort trends are given by-

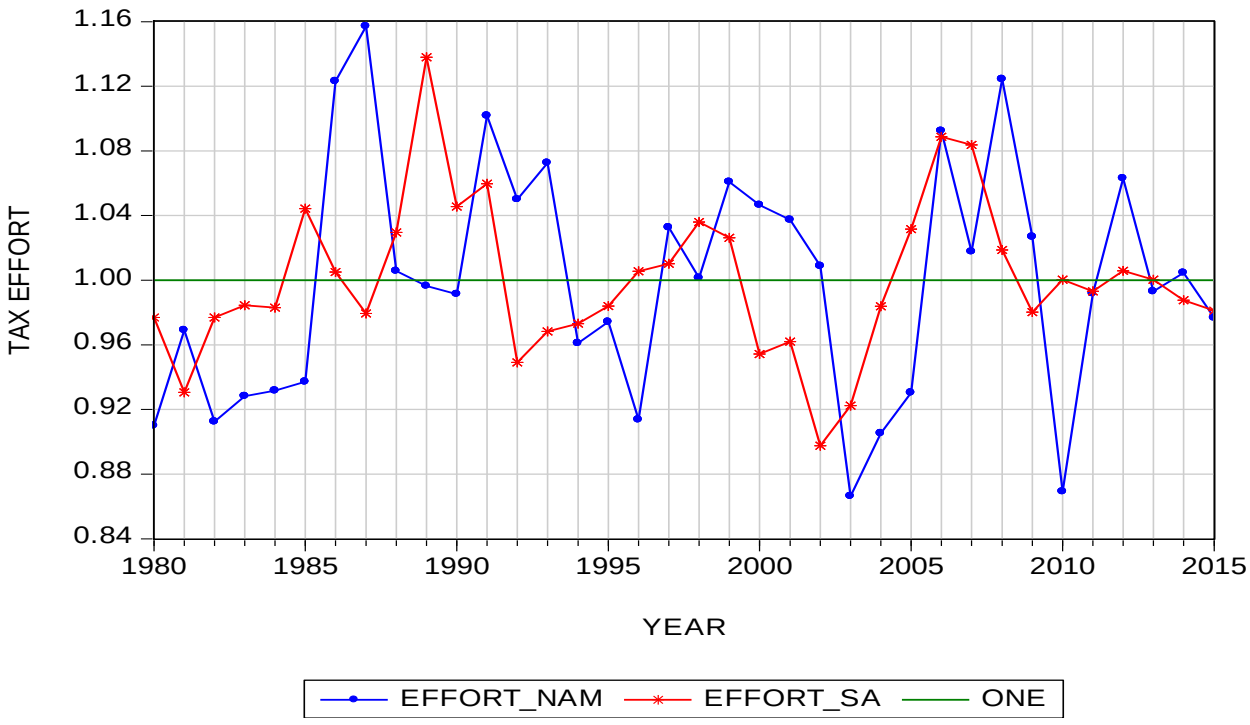

Figure 2: Tax effort trends in Namibia and South Africa

Taxation is therefore the best and unswerving way to finance public disbursements in the long run.

CONCLUSION

Determining the taxation success of countries is both practically and theoretically challenging. Establishing the tax effort index, according to the actual revenues of a country to its estimated taxable amount, gives us a tempting quantity that determines countries specific fiscal,

institutional and demographic traits. Remarkably, the findings in this paper require careful interpretation because of the potential caveats in the development of tax effort and capacity, and quantifying the actual tax-GDP ratio. This study can be harmonizing but not a substitute detailed examination of a country's tax system, which can be used to identify the country's fiscal policy, considering public expenditures needs and the general level of development. Clearly, making important changes in a tax structure is an issue due to possible political weakness and public resistance. The strategy of tax revenue reforms should be constructed after an all-inclusive experiment of the country's taxable amount and should be country-specific, income performance and upmost leadership political commitment. As shown in the empirical analysis, many variables are fundamental in determining the level of taxes in a country. However in current years, both the importance and the magnitude of the effect of institutional quality indexes on tax assortment have elevated significantly. The results indicate that countries with good institutional quality, such as bureaucracy eminence or corruption can collect higher taxes. Countries need to reflect improving quality of governing the country if they wanted to elevate the level of tax income. Despite several developing countries having experienced a chronic gap between the actual and desirable level tax income, developing of a tax effort index, according to the actual tax incomes of a country to its estimated taxable amount, provides a variable that considers country-specific fiscal, institutional and demographic traits. Tax efforts and tax capacity present a significant deviation between South Africa and Namibia over time. Therefore, between the year 1980 and 2014, the strategy of tax revenue and reforms must be country specific and constructed after a complete analysis of the country's revenue performance and taxable capacity. Further studies should consider a comprehensive analysis of a particular country's revenue and tax capacity. Also, the formulated tax reforms should target integrity and efficiency of tax administration, and having multiple and appropriate taxes and tax laws.

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