Tax effort performance in sub-Sahara Africa and the role of colonialism

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ABSTRACT

Governments in sub-Sahara Africa (SSA) have tended to rely unduly on foreign aid and debt financing for the provision of public goods such as health, basic education and infrastructure. Domestic tax revenue could play a significant role in funding such expenditures. However, to date tax revenue collection in SSA has only averaged about 15% of GDP. In this paper we employ cluster analysis to enhance our understanding in the variations in tax effort performance amongst SSA countries. Past studies of tax effort performance in SSA have resorted to economic events or factors to explain the tax effort performance. We argue here that it is necessary to consider historical events to provide a fuller explanation. We provide evidence to show that the different colonial policies pursued in SSA have had a long lasting and profound effect on the countries' tax revenue performance.

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1. Introduction

Tax revenue collection has long been viewed as a fundamental pillar for the growth and development process of any nation. In order to advance development, governments are required to spend more on public services and this can be achieved by *inter alia* improving their tax revenue mobilization. As pointed out by Kaldor (1963), the advancement of developing countries will require tax collection amounts that exceed the 10–15% typically raised in these countries. However, in sub-Sahara Africa (SSA), tax revenue collection has been historically low as governments rely extensively on foreign aid and debt financing to fund vital public goods such as health, basic education and infrastructure. For example, the average aid to gross domestic product (GDP) ratio for SSA countries over the period 1990–2007 was 53%, while tax revenue mobilization on average was only 16% of GDP (World Bank, 2012). The problems associated with excessive reliance on external sources of finance are well known. Besides the long-term issue of sustainability, foreign sources of financing also carry the future obligations of loan servicing and repayments. Although foreign financing can be made attractive by ensuring that such funds are used productively to generate resources for the loans to be serviced and repaid in the future, excessive optimism on the productivity of the loans could also land countries in massive amounts of debt. For these reasons, strengthening the mobilization of domestic resources would not only offer some upfront cash but it would also provide governments with a more sustainable and reliable revenue inflow. It also has the desirability of increasing the credibility of African countries as well as promoting their self-sufficiency. In this paper, we estimate the tax effort performance of SSA countries. Estimating tax effort essentially strives to answer the questions; *Can countries mobilize more tax revenue than they actually do? What are the factors behind the tax effort performance?*

We answer these policy questions by undertaking three modelling experiments. First, we estimate tax effort indices for SSA countries using different model specifications to account for the fact that tax potential is influenced by the choice of the variables employed in the model estimation. It is found that the tax effort performance in SSA tends to be highly varied. Next, we try to harmonize this variation by identifying systematic patterns in the constructed tax effort indices. This is accomplished by employing cluster analysis to identify similar traits in the countries' tax effort performance. Accordingly, distinct clusters of countries that are most similar in terms of tax performance are generated. In the final experiment, we attempt to establish the primal causes or factors behind the tax effort cluster cohorts. In doing so, we argue that to understand the tax effort performance of SSA countries it is necessary to move beyond economic events or factors and to consider historical events. The evidence provided in this paper shows that the different colonial policies pursued in SSA have had a long lasting and profound effect on the countries' tax revenue performance.

The remainder of the paper is organized as follows. Section 2 presents a survey of the existing literature. Section 3 explains the econometric methodology for deriving the tax effort indices. Section 4 then presents the multivariate technique employed to generate the tax effort performance clusters. We then present the cluster cohorts generated from the cluster analysis in Section 5. In Section 6, we identify the characteristics of the different cluster cohorts which have some leverage on taxation. A discussion of how these characteristics emanated from the types of colonial policies pursued in the respective countries is also presented. Lastly, Section 7 concludes.

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2. Literature review

The literature documenting the largely varied tax effort performance across the SSA region is quite substantial. For instance, Newlyn (1985) and Stotsky and WoldeMariam (1997) found that Southern African countries tend to have high tax effort indices, whereas tropical countries such as Central African Republic, Chad, Guinea-Bissau, Niger and Rwanda have lower indices. Gupta (2000) also reports a similar finding that Burundi, Botswana, Malawi and Zimbabwe, mostly Southern African countries, tend to have high indices while countries like Togo, Niger, Guinea Bissau, Chad and Madagascar have low indices. Similarly, Leuthold's (1991) computation of the tax effort indices for a sample of eight SSA countries reveals that West African countries such as Cameroon, Mali, Ghana, Nigeria, Senegal and Ivory Coast had low tax effort indices. More generally, Piancastelli (2001) looked at both developed and developing countries and found that countries like Sierra Leone performed quite poorly.

Based on these findings, it has been concluded that the superior tax performance of Southern African countries compared to the other countries could be attributed to their membership of the regional trade block, the Southern African Customs Union (SACU). Essentially, most studies assert that SACU member countries benefit from the spillover effects from South Africa via a contagion effect or through shared tax agreements (Gupta, 2000; Stotsky and WoldeMariam, 1997). On the other hand, the relatively less impressive revenue performance of countries such as Sierra Leone and Rwanda has been attributed to the incidence of civil war outbreak in these countries.

However, we object to such generalisations as they tend to apply to some countries but not to others. For example, it appears that South Africa's tax policies did not spill over to other SACU members such as Swaziland and Mozambique. Neither does it seem to be the case that incidences of civil war in Angola, Zimbabwe and South Africa hindered their tax effort performance to the extent that they have in other formerly war-torn countries. Thus, the legitimacy of these views is questionable; this creates scope for investigating the varied tax effort performance.

Two distinctive features set apart this study from others. First we recognize that the estimated tax potential can often be subject to volatility with respect to changes in the composition, the size of the sample and the addition of explanatory variables. Indeed Bahl (1971) and Mertens (2003) noticed some volatility in their statistical results with respect to these changes. The way that studies have dealt with this issue has been to use a statistical criterion to select the model that explains the highest variation in tax ratio (i.e. the highest R^2) to construct tax effort indices. However, this presents the dilemma of what to do when different model specifications generate different tax effort indices but high and identical R^2s. To avoid this predicament, we deviate from the usual approach of using a single model estimation to estimate one tax effort index for each country. Instead, we employ several model specifications, bearing in mind that each model represents some unique feature of a given country, an aspect which makes all the different model estimates for each country uniquely valid. A cluster analysis technique is then used to identify the countries with similar traits and subsequently to generate clusters that place them in distinct tax effort groups.

The second distinct feature of this paper is inspired by the cluster cohorts generated using the cluster analysis. Interestingly, what emerges from these tax effort clusters is a close resemblance with the "Macro regions" model of colonial influence proposed by Oliver and Atmore (1967) and Amin (1972). As already argued, explaining the tax effort performances solely in terms of differences in the evolution of previous economic events is insufficient. For further insight, this paper examines the countries' more distant past. Influential studies by Acemoglu et al. (2001), Austin (2008), Bolt and Bezemer (2009), Bowden and Mosley (2008) and Engerman et al. (2005) have already verified the notion that the initial conditions of African countries were shaped by colonial culture, forms of colonization and institutional heritage. These in turn

affect their economic performance even to the present period. Within this context, we present evidence deduced from our multivariate analysis to show that the colonial legacies bequeathed to SSA countries offer more elucidation on the varied tax effort in SSA.

3. Empirical strategy

This section comprises two sub-sections. The first sub-section presents the strategy employed to construct tax effort indices. This is followed by a description of the multivariate technique used to derive tax performance cluster cohorts.

3.1. Tax effort indices

In this paper, we adopt Tanzi and Zee's (2000) approach which measures tax effort using the ratio of a country's actual tax revenue to its taxable capacity (or potential tax revenue). Taxable capacity is estimated using a global sample of developed and developing countries and the tax effort of a given country is the ratio of the actual tax revenue in that country to the tax capacity derived from the global sample. Through such an analysis, it can be determined whether a country is using taxable capacity at a level consistent with other countries and the country's relative position vis-à-vis the others can also be established. To estimate taxable capacity, we estimate the following multiple regression model using an IV-2SLS technique:

$$TR_{it} = \beta_0 + \phi X_{it}^{'} + \mu_i + \gamma_t + \varepsilon_{it} \tag{1}$$

where TR_{it} denotes the tax ratio of country i at time t, X_{it} is a vector of control variables, μ_i is the unobserved country specific effects, γ_t is an unobserved time effect, and ε_{it} is a white noise disturbance term. The vector X_{it} is defined as follows:

$$X_{it} = (nr_{it}, inst_{it}, nr * inst_{it}, ly_{it}, agr_{it}, trade_{it}, manuf_{it}, aid_{it}, informal_{it}). \tag{2}$$

The selection of variables captures the counties' structural characteristics – natural resources (nr), log of per capita income (ly), agricultural sector (agr), trade sector ($trade$), manufacturing sector ($manuf$), the quality of institutions ($inst$) and the interaction between natural resources and the quality of institutions ($nr*inst$) – as well as policy variables such as foreign aid (aid) and the informal sector ($informal$).[1]

In order to tackle the simultaneity bias that may arise from the relationship between tax revenue and quality of institutions, log of per capita GDP and foreign aid, we use appropriate instrumental variables that directly determine the endogenous regressors but not the dependant variable. Malaria ecology from Sachs (2003) is used as an instrumental variable for GDP per capita since it is exogenous to economic conditions. Ethnic, linguistic and religious fractionalization indices suggested by La Porta et al. (1999) and Alesina et al. (2003) are used as instruments for quality of institutions. Lastly, foreign aid is instrumented using a variable measuring the proportion of the population that speaks English and major languages of Western Europe (Eurofrac) taken from Hall and Jones (1999).[2]

The construction of tax effort indices for SSA countries follows three basic steps:

1. Eq. (1) is estimated on a larger sample of 211 developing and developed countries.

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[1] The interaction term captures the interplay between nr and $inst$. Essentially, the extent to which natural resources affect tax effort depends on the quality of institutions. Our results indicate that this interaction effect is very significant and robust.

[2] The intuition behind this instrument is based on the idea that if a higher proportion of the population still speaks the language of the former colonial master, then this may signify the existence of continued relations and therefore aid disbursements to the former colony.