NSI The North-South Institute

Aid and Taxation:
Is Sub-Saharan Africa Different?

May 2012

by

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Abstract

Since the Monterrey Consensus in 2002, there has been increasing emphasis on domestic resource mobilization (DRM) to meet the MDGs. Nowhere are the challenges to DRM more pronounced than in sub-Saharan Africa, with its low savings rates, high dependence on foreign aid and weak capacity to mobilize domestic resources. In fact, aid receipts are higher than taxation revenue and also constitute a significant part of government revenue in several African countries. In this paper, we focus on one particular aspect of DRM, namely taxation and the extent to which it is affected by aid, in sub-Saharan Africa over the period 1972-2008. The existing literature has generally found a negative relationship between aid and taxation but the results are very sensitive to data quality and specification problems. We revisit the aid-taxation link using more recent data as well as a new and more detailed dataset by Keen and Mansour (2009), which allows us to focus on revenues that require more state capacity to collect. Controlling for the different determinants of taxation, we find that aid has had no significant impact on taxation generally or in sub-Saharan Africa particularly. Our results are robust to different specifications and time periods, as well as aid thresholds. Drawing on recent findings from five case studies of sub-Saharan countries that identified significant untapped DRM potential in the region (North-South Institute, 2010), we conclude that aid could be better targeted to increase DRM.

Introduction

In developing regions, especially sub-Saharan Africa, domestic resource mobilization (DRM) has a significant international dimension. In many cases, resources lost to capital flight and transfer pricing exceed aid flows; remittances are becoming increasingly important; revenues from trade taxes are in decline; and aid accounts for a large (in many cases growing) share of the government budget. The dramatic reversal of trade and financial flows during the global economic crisis, together with the general uncertainty and volatility of aid flows, has heightened the need to think about more stable and sustainable modes of development finance.[1] DRM has been a relatively neglected factor in strategy development, especially in sub-Saharan Africa (Culpeper and Bhushan 2008, 2009, 2010). However, in recent years it has received increasing attention in the development discourse beginning with the Monterrey Consensus on

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[1] Aid from OECD-DAC countries to the African continent increased by 0.9% in 2011, even if, overall and as a result of fiscal constraints, it fell by 2.7% in real terms in 2011.

Financing for Development in 2002 which argued in favor of "the need to secure fiscal sustainability, along with equitable and efficient tax systems and administration..."[2] More recently, the donor community has begun to acknowledge the importance of DRM, as evidenced by support for initiatives such as the African Tax Administration Forum (ATAF). Enhancing DRM is limited by challenges on both the fiscal side - broadening tax bases and ensuring that tax systems are simple, fair, and efficient and that governments are accountable to taxpayers - and on the financial sector side enhancing mobilization of savings, increasing penetration of banking and financial services to all sections, and ensuring that savings are channeled into productive investment. Notwithstanding recent interest in DRM as evident in support for ATAF (November, 2009) and in the recent European Commission communication on Tax and Development (April, 2010), regional and multilateral institutions such as the World Bank, IMF (through Regional Technical Assistance Centers) and African Development Bank have been working on supporting tax capacity, deepening and developing the financial sector in sub-Saharan Africa for decades. So a legitimate question is why now? What is different in the case for enhancing DRM? There are at least three good reasons.

First, most donor countries fail to live up to the long-standing commitment to deliver 0.7% of GNI as aid even in good times. More recently donors have fallen far short of the Gleneagles (2005) commitments to raise the volume of aid and double aid to Africa by 2010. Beyond the numbers there is also a sense that donor views on the purpose of aid are constantly shifting and there is increasing skepticism about the utility of aid given over decades and development results achieved. Moreover, the global economic crisis has brought aid budgets in many countries under pressure. In tough times aid is unfortunately an easy line item for cuts. We know from past crises in donor countries that aid budgets decline, bottoming out over several years, and may not return to pre-crisis levels at all (Dang et al. 2009; Roodman, 2008). This makes enhancing alternative sources, including but not limited to domestic resources, a matter of urgency.

Second, for many developing countries the experience of East Asian economies, and more recently China and India has been seminal. In each case these countries followed a growth path which in addition to integration into the global economy was underpinned by very high levels of DRM (domestic savings and investment). Indeed, as the Commission on Growth and Development (2008) which examined the experience of 13 high-growth economies since 1950 concludes, "there is no case of a high investment path not backed up by high domestic savings." Furthermore as the report notes, in principle countries could rely on foreign capital to finance investment, but capital inflows over the past several decades have a mixed record. Foreign savings are an imperfect

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[2] See "Monterrey Consensus of the International Conference on Financing for Development," United Nations, 2003.

substitute for domestic saving, including public saving, to finance the investment a booming economy requires. Third, it is now widely accepted that external resources alone will not be enough to meet financing needs associated not merely to meet the Millennium Development Goals (MDG) but also to sustain developmental performance beyond 2015. Aid in most countries simply will not be sufficient. Moreover aid-financed projects give rise to additional spending needs which are expected to be covered by domestic resources. Thus, even in the context of increasing aid levels enhancing DRM is crucial.

In this paper, we focus on one aspect of DRM, namely taxation, and how it has been affected by aid flows in the sub-Saharan African context. Our research question is whether aid has affected the ability of countries to tax in sub-Saharan Africa. We examine this question by drawing on the findings of five case studies, as well as empirically using data over the period 1972-2008. We contribute to the existing literature in several ways. First, we draw on both case studies and empirical analysis. Second, we update existing studies by considering more recent data as well as a new dataset by Keen and Mansour (2009). Third, we are able to consider different types of taxes in our analysis.

In theory, aid could be directed towards improving tax systems in developing countries but there is little evidence to indicate that this has been an important priority for donor countries. Instead, skepticism about the effectiveness of aid in recent years has partly been framed in terms of its disincentive effects, of which one aspect is the negative impact that aid can have on taxation. Since taxes create a fiscal pact between taxpayers and the government, the latter is expected to provide goods and services in return so that taxes are "scrutinized" sources of revenue. Aid as an "unscrutinized" source of revenue can instead reduce tax revenues or be a disincentive for governments to impose taxes and/or reform their tax systems.

Our focus on taxation does not mean that other factors do not matter. For example, with reference to East Asia, Di John (2008) makes the case that taxation should be viewed within a wider DRM perspective. The state's capacity to mobilize resources beyond taxes is an important feature of developmental success stories. This is clear from East Asia's experience, where although tax-to-GDP ratios are similar to those of other developing regions, there are major differences in saving and investment rates, achieved largely through restrictions on credit, mandatory pension contributions, encouragement of postal savings, and a close nexus between investment and export promotion. However, an examination of the aid-taxation link in the case of sub-Saharan Africa is important for several reasons. First, on the taxation side, about a third of non-

resource tax revenue in sub-Saharan Africa comes from trade taxes; however, this figure is in decline — from over 6 per cent of regional GDP in the early 1980s to 4 per cent by the early 2000s. This is in keeping with the global trend toward tariff reduction and integration, but presents a major fiscal challenge for non-resource-rich sub-Saharan Africa in particular (Keen and Mansour 2009). In that region, the average tariff rate has declined from over 20 per cent in the 1980s to 13 per cent by 2005. Low income countries face the biggest challenge of replacing lost trade revenues (on average 30 cents on every dollar) (Baunsgaard and Keen 2005). Although collection efforts seem to be improving in Africa, when revenue from resources is excluded, one can hardly see any improvement in the tax/GDP ratio from 1980 to 2005 (Keen and Mansour 2009). Second, on the aid side, while the importance of aid to the oil-exporting and middle income countries in sub-Saharan Africa has declined, the low income and fragile countries continue to depend heavily on it as a source of financing.

Third (and more generally), political scientists have long emphasized the fact that taxation is fundamental to state building (Herbst 2000, Tilly 1975) and forms the foundation of the social contract between the state and citizens. It is well recognized that without taxation there can be no viable state (OECD and AFDB 2010). In this context, there is growing concern that heavy reliance on resources other than broad-based domestic taxation can be a disincentive to develop institutional capacity, accountability to citizens and ultimately promoting prosperity. Governments that derive the bulk of their resources from donors, for instance, may be more responsive to donor than domestic priorities (where the two differ). Indeed the undermining of good governance and political accountability may be the most important reason to be concerned about high levels of aid dependence and why some have made the case for capping aid at levels linked to domestic tax mobilization (Wood 2008).[3] Finally, the impact of aid on fiscal (taxation and spending) behavior has broader implications for aid effectiveness as it affects growth and human development.

The rest of the paper proceeds as follows. In the next section, we review the existing literature on aid and taxation. In section 3, we summarize the lessons learnt regarding the relationship between aid and taxation from a recent examination of five country studies – Burundi, Cameroon, Ethiopia, Tanzania and Uganda - on DRM in Sub-

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[3] This is not to suggest that aid-dependence is the only or even the main factor undermining accountability and good governance. There are of course numerous countries with poor track records where aid does not play a significant role. Among the cases examined in section 3, Cameroon for instance ranks poorly on corruption and has a lower business climate ranking than Ethiopia, Tanzania and Uganda where aid plays a much greater role. Conversely there are several examples where very high aid levels have played a useful role, especially in post-conflict Bosnia, and in relatively good performing Ghana, Tanzania, Uganda and Rwanda.

Saharan. Section 4 presents the empirical model and data used while section 5 discusses the results of our empirical analysis. Section 6 concludes the paper.

Literature Review

As discussed in the previous section, donors have paid very little attention to the impact of foreign aid on recipient countries' ability to tax. Because aid can in theory be used to improve taxation systems and collection, and because it can also have disincentive effects, the relationship between aid and taxation cannot be determined a priori. The existing (theoretical and empirical) literature, which we briefly review below, has not been able to provide a clear answer to this question. We focus mostly on empirical studies that examine the determinants of tax effort but there are two other related literatures that have contributed to the debate and are worth mentioning.

First, fiscal response models, based on the seminal paper by Heller (1975), have examined the utility-maximizing behavior of governments where fiscal decision makers minimize a quadratic loss function subject to a budget constraint defined by revenue, borrowing and aid, in order to attain revenue (tax and borrowing) and expenditure targets. Using data for eleven African countries in the 1960s, Heller (1975) found that aid had a negative impact on tax revenues but others such as Khan and Hoshino (1992) found a positive impact while Ouattara (2006) found the relationship to be not significant. Other papers in the fiscal response literature have endogenized aid as well as disaggregated it into different components but empirical results have remained mixed; furthermore, even if they are helpful in terms of theorizing about government decisions and behavior, these models cannot really account for why recipients may change their targets for expenditure and/or taxation over time.

Second, aid fungibility studies (McGillivray and Morrisey 2000, 2001) have examined whether aid is being used for purposes that are different from those intended by donors. If aid is being allocated to a particular project that the recipient government would have funded anyway, it releases resources that the government can spend on other things. In other words, aid is fungible in the sense that it is financing other expenditures (or tax reductions) by the government, even if the project gets done. On the other hand, even if aid is not fungible, it may not be fully additional if the recipient reduces resources (taxation or revenue) allocated to the affected sector. Aid fungibility studies have also obtained mixed evidence regarding the relationship between aid and taxation (see Cashell-Cordo and Craig 1990; Pack and Pack 1990, 1993).

Studies that are of greater interest to us are those that examine the determinants of tax efforts. Here again, there is a long list of papers that have followed this approach by conditioning on country and structural characteristics. The often used tax-to-GDP ratio (the dependent variable) is a relatively crude measure of "tax performance." From Musgrave (1969), Tanzi (1987), and others, we know that economic development brings about both increased demand for public expenditure and greater taxable capacity to meet the demands. However, beyond income level,[4] several other factors contribute to tax performance, e.g., degree of urbanization, economic structure (Stotsky and WoldeMariam 1997), openness to trade, tax evasion (Teera 2002, Teera and Hudson 2004), and, ultimately, fiscal policy choice. These concerns led to the development of indicators of "tax effort," the degree to which available capacity in a country is being fully utilized (Goode 1984). Building on this work, Teera (2002) and Teera and Hudson (2004) examined tax effort across countries by income level and found that low-income countries (LICs) are not fully exploiting their taxable capacity. They also found tax evasion to be an important determinant of tax performance, and tax revenues in LICs are least responsive to policy change and economic growth.

Having reviewed a broad sample of the aid-taxation literature, we find that the majority of the empirical literature emphasizes a negative link between aid and taxation in developing countries, i.e. high levels of aid have a negative impact on revenue mobilization. However, these findings are sensitive to methodological specifications and significant gaps in the data (especially tax data). Several studies document a statistically significant negative relationship between aid (usually measured as a percentage of GDP, GNI or government expenditure) and taxation measured as the tax/GDP ratio (Brautigam and Knack, 2004; Remmer, 2004; Moss et al., 2008). More troubling is the finding that high levels of aid erode governance, operationalized variously as changes in indicators of democracy (Djankov et al, 2005), country risk (Brautigam, 2000), and more recently the World Bank's 'Efficiency of Resource Mobilization' (ERM) Country Policy Institutional Assessment indicator for quality of tax systems (Knack, 2008). Reminiscent of the micro-macro paradox in the aid-growth literature, studies at the country level find a positive relationship between aid and revenue mobilization in some countries – for example, Indonesia (Pack and Pack, 1990) and Ghana (Osei et al, 2003) – and a negative relationship in others – for example, Pakistan (Franco-Rodriguez et al., 1998) and Cote d'Ivoire (McGillivray and Outtara, 2003).

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[4] Some researchers have found that the importance of per capita income as a major determinant of taxation is declining (Tanzi 1992, Teera and Hudson 2004).AA

A further issue, beyond aid levels is whether the type of aid –grants or loan– has any impact on revenue mobilization in recipient countries. In a much cited paper Gupta et al (2003) find net aid has a negative impact on government revenue and that the relationship is primarily driven by the negative impact of grants. The relationship is more pronounced in countries with high levels of corruption; grants seem to substitute for domestic revenue effort (as opposed to loans – presumably because they have to be serviced). Gambaro et al (2007-unpublished) find a positive relationship between aid and tax revenue (using different data enlarging sample size) driven by the role of grants, but only for a shorter and more recent period (1990-2002). The authors attribute this to new trends in donor/recipient practices including the recent emphasis on institution building.

What can we take away from the discussion? The most reasonable conclusion is that there is significant ambiguity in the aid and taxation literature, and findings – either that aid has enhanced or hampered domestic tax mobilization – are sensitive to methodological choices, sample size and data limitations. In the next section, we review some recent evidence on aid and taxation based on five recently completed country case studies from sub-Saharan Africa as part of broader DRM project from the North-South Institute (2010).

Evidence from Case Studies

The North-South Institute's DRM case studies were conducted in five sub-Saharan African countries: Burundi, Cameroon, Ethiopia, Tanzania and Uganda. Researchers were paired up with policymakers and officials in the ministries of finance, revenue authorities and central banks of the respective countries, and findings were discussed in five in-country stakeholder workshops held in September 2010.

While the studies were broad, with respect to aid and the role of donors in promoting tax mobilization, the following findings stand out and are discussed further: despite significant recent reforms to both tax policy and administration, performance has been mixed, limited by structural factors including low per capita income and very shallow tax bases. There is significant variation across the five case study countries in terms of donor support for tax mobilization, and where support has been high (such as in Uganda and Tanzania) common patterns are visible (discussed below). Donor support for country tax efforts seems to have short-term impact on tax mobilization performance which countries find hard to sustain over time. Findings on what happens to tax

mobilization during periods when donors sharply scale back assistance lend support for the argument that there is no systematic relationship between aid and tax mobilization, either positive or negative. Estimates of revenue foregone due to tax exemptions suggest greater DRM potential in the five countries than is currently being realized. The overall revenue sources (tax and non-tax) driving recent performance across our five case study countries is significantly different from that of the African region as a whole, where a substantial increase in resource revenues has been the main (if not only) driver of increasing resource mobilization. In four of our five countries, aid continues to be a much more significant driver of revenue mobilization than it is for the region as a whole. Structural factors are important in contextualizing the tax performance of the five case study countries. Per capita incomes, though rising, are still very low. In 2008 only Cameroon ($2334) had per capita income (in purchasing power parity terms) higher than the average for the sub-Saharan region and low income countries as a group. Per capita income in Burundi ($338), a fragile state still recovering from years of conflict, remains far below even the average for low income countries, as is also the case in Ethiopia ($802) and Tanzania ($1163), while Uganda matches the average for low income countries ($1371). The share of agriculture and the informal economy, with the exception of Cameroon, is high in the other four countries, while the penetration of financial infrastructure (measured by household access to formal financial institutions) remains at some of the lowest levels in the developing world. These factors make DRM difficult. Perhaps unsurprisingly the ratio of total revenue mobilization to GDP in all the case study countries is well below even the African average; when grants are included only Burundi comes close to the regional average (explained by the very high percentage of aid as a share of GDP).[5]

Sub-Saharan Africa, including the five project countries, has a long history of donor backed tax reforms going back to Structural Adjustment Programs (SAPs) in vogue during the 1980s and 1990s. More recently the two main areas of donor supported tax reforms have been the introduction of the Value Added Tax (VAT) and establishment of autonomous revenue authorities (ARAs).[6] Each of the five case study countries has introduced the VAT, though in some cases very recently (Uganda in 1996, Tanzania in 1998, Cameroon in 1999, Ethiopia in 2003, Burundi only in 2009). Greater revenue

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[5] Total revenue mobilization (including non-tax revenue but excluding grants) to GDP in 2008 was: 17.7% in Burundi, 19.9% in Cameroon, 11.9% in Ethiopia, 16% in Tanzania and 14% in Uganda. Including grants the ratio stood at 30.2% in Burundi, 20.8% in Cameroon, 16.4% in Ethiopia and 15.5% in Uganda compared to the African average of 32.2%.
[6] External taxes and tariff regimes are harmonized with regional trading partners as four of the five project countries are members of customs unions, Cameroon is a member of Central African Economic and Monetary Community (CEMAC); Burundi, Tanzania and Uganda are members of the East African Community (EAC).
[6] There were no major tax reforms in Burundi before 2005 due to the civil war. Ethiopia is still in the process of transition from a closed socialist economy to a market oriented economy.

potential, more equitable distribution of the tax burden and broadening the tax base were key reasons for the introduction of the VAT. The timeline of VAT reforms mirrors the broader history of tax reforms in these countries. Uganda and Tanzania have much longer histories of tax reforms and donor support in the area of tax mobilization than the other three.   Tanzania has one of the highest densities of donor activity related to taxation in Africa and strengthening tax administration has been a longstanding conditionality by the donor community (ITC, 2010). Despite this, most studies including our own conclude that reforms such as the VAT have not brought many new groups into the tax net, that the tax system remains complicated and opaque, and that administrative reforms have produced mixed results (Fjeldstad et al. 2003). While the advantages of the VAT are widely acknowledged, implementation has proved challenging owing to the predominance of small informal operators, history of tax evasion and corruption, and lack of record keeping systems. This is particularly the case in Ethiopia and Burundi where these reforms are still new.

Improving tax administration and overcoming governance issues – especially public perception of corruption within tax authorities and undue political interference in tax administration – are the main reasons why donors have strongly supported the establishment of autonomous (and semi-autonomous) revenue authorities (ARAs) across Africa. Where explicit donor support for taxation has been high, donors have shown a clear preference for the ARA model.[7] The first such ARA, the Uganda Revenue Authority, was established in 1991. The Tanzania Revenue Authority was established in 1996.[8] In both cases (as well as others like Ghana and Rwanda) tax mobilization initially increased substantially, but from a low base following either economic downturns and or civil conflict. Most countries with the exception of South Africa and more recently Ghana, have found it difficult to sustain mobilization performance. Therefore the impact of the ARA model has been questioned and criticized in the African context (Fjeldstad and Moore, 2008). A pattern that is observable is that donor support for taxation, as measured by the share of aid going to public financial management (PFM), which varies greatly across the region, is much higher in these countries. Aid to PFM as a share of total aid on average across developing countries during 2000–2010 was at 0.33%, and a similar ratio is found for sub-Saharan Africa at 0.34%. The ratios for Uganda and Tanzania are much higher at 0.64% and 0.49% respectively (a pattern also visible in other low income sub-Saharan

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[7] We use "ARA" to describe both fully autonomous and semi-autonomous revenue authorities interchangeably.
[8] The first experiments with the ARA structure go back to Ghana in 1985 following a major economic crisis. Ethiopia established a unified revenue body only in 2009, which reports directly to the Prime Minister. Burundi began implementing the Revenue Authority of Burundi in 2010, modeled after the experience of the Rwanda Revenue Authority, with strong support of the UK's DFID.

countries that have embarked on ARAs including Rwanda at 1.02%, Zambia at 0.66% and Malawi at 0.41%). By contrast the same ratio in Ethiopia, Cameroon and Burundi is only 0.13%, 0.13% and 0.04%. The significant variability raises questions regarding the motivations behind donor PFM aid and also speaks to the herd behavior amongst donors who tend to focus on selective countries (like Tanzania) while neglecting others when it comes to taxation which has been criticized by other research (ITC, 2010).

An examination of the aid and taxation data in relation to the recent political histories of our case study countries has produced some evidence that the domestic resource potential of sub-Saharan African countries may be greater than previously realized. Throughout the 1980s and 1990s, three of our case countries - Uganda, Burundi, and Ethiopia - experienced a marked reduction in aid due to conflict or embargo. However, despite having been highly aid dependent, Uganda and Burundi both witnessed an increase in tax revenue during periods of reduced donor support, while tax revenue in Ethiopia remained largely unaffected by declining levels of foreign aid. Indeed, during the 1996-1999 embargo in Burundi, total tax revenues (excluding grants) increased from $116 million in 1996 to $167 million by 1998 – an amount that would not be matched until 2006. Uganda also experienced an increase in domestic revenue mobilization in the presence of minimal external income during its 5-year 'bush war' from 1981-1986, with domestic revenue (as a percentage of GDP) reaching an 11-year high at 12.2% in 1983/84, the same year that external funding composed a mere 0.6% of total government income (Teera, 2003). While both countries experienced a marked decline in domestic revenue following the embargo and war, the capacity for both Uganda and Burundi to increase tax revenue in the absence of donor support suggests that the potential for developing countries to generate domestic resources may be higher than typically recognized.

Another factor that suggests greater domestic revenue potential than currently being realized is the proliferation of tax exemptions. The number of countries in sub-Saharan Africa offering exemptions of some type (especially in the form of "free zones," reduced corporate tax rates, tax holidays, and investment codes) has risen substantially from 1980 to 2005 (Keen and Mansour, 2009). Exemptions contract the revenue base, complicate tax systems, and open the door to political capture (the party or group in power often uses discretionary exemptions to retain power or undermine businesses linked to the opposition). More importantly, exemptions have a ratcheting effect; once in place they are hard to remove. Our case studies found that revenues foregone due to exemptions, while hard to estimate, represent a significant share of the revenue base. The IMF estimated undue exemptions in Burundi cost the treasury up to 1.5% of gross domestic product (GDP) in recent years. The highest level was reached in 2006 when

60% of imports entered the country with full or partial exemptions for a total of 10.7% of GDP or 65.5% of tax revenues. In Ethiopia (leaving aside tax holidays of five to seven years) total revenues foregone due to customs exemptions alone were in the range of between 3.7% of GDP (2005) and 4.2% of GDP (2008). Similarly in Tanzania losses from customs and VAT exemptions range from between 4.5% of GDP (2005) and 3.6% (2007). In Uganda where select ten year tax holidays were introduced in 2007-08, key informants suggest foregone revenues amount to at least 2% of GDP. Clearly the level of exemptions relative to the low revenue bases in these countries suggests the revenue potential is not being maximized, while the impact on investment promotion and other considerations remains unclear.

Finally, using the African Economic Outlook (AEO) dataset – which contains the most recent and comprehensive taxation data for sub-Saharan Africa - we examine disaggregated tax revenue data in efforts to view the composition of the revenue mix, and compare the same with the broader trend for the African region. We find that revenue mobilization for African countries between 1996 and 2008 is driven by the 'other taxes' category (primarily those related to commodity production and exports). Total revenue mobilization from all sources (including grants) increased from $119 billion in 1996 to $495 billion by 2008. In 1996 other taxes (resources related) made up around 22% of the total revenue base while direct taxes on income and profits accounted for 26%, indirect taxes around 25%, trade taxes around 12% and grants around 4.5%. By 2008 the picture changed considerably, with resource related taxes at over 46%, direct taxes at 21%, indirect taxes at 16%, trade taxes at 6.3% and grants at 2.4%.

The increasing proportion of resource taxes relative to overall mobilization throughout Africa is not mirrored in our sample countries, as with the exception of Cameroon, and recently Tanzania, 'other taxes' compose only a minor share of tax revenue. Rather, resource mobilization within our case countries was largely driven by aid grants; with 2008 figures showing that aid grants composed almost 35% of total revenue for Burundi (down from as high as 45%), 27% for Tanzania, 25% for Ethiopia, and 17% in Uganda.[9] Despite significant tax policy and administration reforms and strong donor support for tax mobilization (at least in Uganda and Tanzania, but also increasing in others) our five case study countries remain highly aid reliant for the foreseeable future. In the next

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[9] Uganda is the only exception where the share of grants is declining rapidly, and is expected to continue to do so especially as oil revenues begin to come on stream, while direct taxes on income and profits are rising as a share of total revenue.

sections, we examine the relationship between aid and taxation for a broader sample of sub-Saharan African countries; we also consider different types of taxes in our analysis.

Empirical Framework and Data Used

In order to examine the empirical relationship between aid and taxation in sub-Saharan Africa, we build on the empirical literature on tax effort – measured as tax revenue as a share of GDP - discussed above. The main determinants of tax shares are the level of development and the economic structure (which form the elements of the tax base) and these are measured by GDP per capita, the degree of openness of the economy and the agricultural share of GDP. As argued in the introduction, foreign aid being an "unscrutinized" source of revenue can be a disincentive for governments to tax and reform their tax systems; as a result, foreign aid is expected to reduce the tax effort (Brautigam and Knack, 2004; Ghura, 1998; Moss et al. 2008).

As a result, in addition to foreign aid, our baseline estimates consider GDP per capita, the contribution of agriculture to GDP, and the degree to which a country is open to trade as independent variables. In particular, it is expected that countries with higher levels of per capita income are able to draw more revenue from taxes since potential taxable income is larger and tax collection systems are more developed and efficient. Similarly, more open economies can derive higher revenue from taxes as goods that cross the border are easier to tax and trade takes place through formal markets. On the other hand, countries that are heavily dependent on agriculture can be expected to have lower tax shares as, first, agricultural trade, especially when it is at the subsistence level, takes place in the informal sector and, second, agriculture is harder to tax than a well-organized industrial sector.

We thus estimate the following regression using panel data over the period 1972-2008:

$$tax_{it} = \alpha_0 + \alpha_1 \ln(gdppc) + \alpha_2 aid + \alpha_3 agr + \alpha_4 trade + u_i + v_t + e_{it} \quad (1)$$

where i indexes countries and *t* indexes time; *tax* is tax revenue as a share of GDP; *gdppc* is GDP per capita; *aid* is aid as a share of gross national income and was obtained from the OECD Development Assistance Committee dataset; *agr* is agriculture value added as a percentage of gdp; *trade* is the trade (exports and imports) to GDP ratio; u_i and v_t are country and time specific effects and e_{it} is the normal disturbance term. All variables are averaged over four-year periods to smooth year-to-year fluctuations in the data, which is a standard practice in aid-effectiveness studies.

Furthermore, we lagged all independent variables by one period to reduce the likelihood of endogeneity. In other words, the averages for the dependent variable are for 1973–76, 1977–80, 1981–84, 1985–88, 1989–92, 1993–96, 1997–2000, 2001–04, and 2005–08. The corresponding averages for the independent variables are for 1972–75, 1976–79, 1980–83, 1984–87, 1988–91, 1992–95, 1996–99, 2000–03, and 2004–07. In other words, t goes from 1 to 9, and depending on the tax data that we use (more on this below), these periods will be adjusted based on data availability, but the same set-up will be followed. Our objective was to try to keep the model as simple as possible while controlling for the main determinants of tax shares. The baseline model initially included manufacturing value added as an additional structural factor but it was never significant and was thus dropped.

In order to examine the robustness of our results, we then add additional factors to the baseline specification. In particular, we consider the rate of inflation, the size of the external debt, and a variable measuring political regime type. Since high inflation rates are expected to reduce the real value of taxes collected, one expects to find a negative relationship between these two variables. In the case of external debt, the ability of countries to borrow and accumulate debt may mean that they do not have to rely on taxes, especially when political cycles are short. However, governments may also resort to higher taxes to finance increasing debt burdens. Finally, regime type is important and one would expect democracies to tax more in exchange for core "public" goods and accountability. The type of political regime is likely to act as proxy for the institutional characteristics of countries.[10] We also add a "conflict" variable to our baseline specification and the extended one, as many countries suffered from civil wars over the period of study. Conflict obviously affects the ability of countries to raise revenues and any assessment of the relationship between aid and taxation cannot ignore it. The variable that we use to characterize conflicts comes from the Political Instability Task Force (PITF), which covers events stating in 1955 and defines state failure broadly to include revolutions, ethnic conflicts, regime changes, and genocides and politicides. This variable is a dummy variable so that if a state failed in a particular year it received a 1, and 0 otherwise. Unless otherwise indicated, all the other variables were obtained from the World Bank's World Development Indicators database.

Table 1 below presents the summary statistics for the variables used to estimate the above equation. Tax data generally and for low income countries specifically, which includes much of sub-Saharan Africa, is the most difficult to obtain. Most studies tend

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[10] Our choice of additional elements is driven not only by theory but for practical reasons having to do with data availability.

to use the Government Financial Statistics (GFS) Database from the IMF but coverage is quite poor even if the time series starts in 1972. As a result, very few African countries are represented in existing studies. We were able to draw from another source of data for taxes from Keen and Mansour (2009), henceforth KM, who agreed to share their data with us. Their tax data is assembled from IMF Staff Reports for the period 1980-2005 and has greater coverage and consistency. Furthermore, they provide a breakdown of tax revenue into different sources (such as trade tax revenue, indirect tax revenue, income tax revenue and resource revenues). We used their equivalent of the tax to GDP variable (KM) as the dependent variable and also constructed two dependent variables which excluded trade and resource taxes (KM1 excludes trade taxes whereas KM2 excludes both trade and resource taxes). The rationale for doing this is as follows: first, due to trade liberalization, there has been a secular decline in trade taxes for sub-Saharan African countries; second, excluding trade and resource taxes allows us to examine the impact of aid on taxes (direct and indirect) that require more effort on the part of the state to collect.

Table 1: Summary statistics

Variable Name	Number of Observations	Mean	Median	Standard Deviation
Tax (% GDP): GFS	174	16.63	15.56	8.18
Tax (% GDP): KM	293	16.59	14.77	8.13
Tax (% GDP): KM1	293	11.02	9.82	7.86
Tax (% GDP): KM2	293	8.67	8.43	5.85
Log (GDP per capita)	375	6.09	5.82	0.99
Aid (% GNI)	378	12.74	10.18	11.80
Agriculture (% GDP)	371	31.11	32.48	16.45
Trade	379	57.99	48.10	46.69
Log (inflation)	307	2.28	2.33	1.33
Log (debt)	356	4.10	4.20	0.93
Democracy	387	-2.50	-4.75	5.69

Note: all variables are 4-year averages, which mean that the actual number of yearly observations is much higher than indicated in the table.

The AEO dataset which was used in section 3 above also has detailed data on taxes but it only starts in 1996; given that it is highly correlated with Keen and Mansour (2009), we don't think it would change our results significantly, even if the number of data points would be reduced considerably as a result of the shorter time period. As we can see in Table 1 above, we have more observations when we use tax data from Keen and Mansour (2009) even if the time period is shorter than the GFS tax data. Pair-wise correlation analysis among the variables in the above table indicated that they are not

very highly correlated, except for income per capita and agriculture as a percentage of GDP, and the different tax variables (see Appendix 1). What about the relationship between aid and taxes? Simple scatterplots of aid vs. taxes using GFS tax data and the KM tax data show a clear negative relationship between aid and taxes in sub-Saharan Africa (the dotted lines are the averages for each variable). While there are not many cases of high aid/high taxes (upper right), there are as many cases of high aid/low taxes and low aid/high taxes (which would seem to fit the disincentive theory of aid on taxation). We examine this relationship more carefully in the next section, by controlling for other determinants of tax effort.

Figure 1: Aid vs. Taxes in sub-Saharan Africa (4-year averages)

(a) GFS Tax Data, 1972-2008
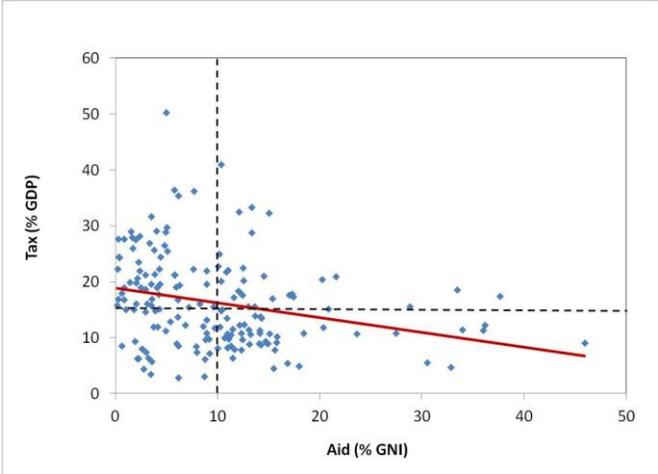
(b) KM Tax Data, 1980-2005
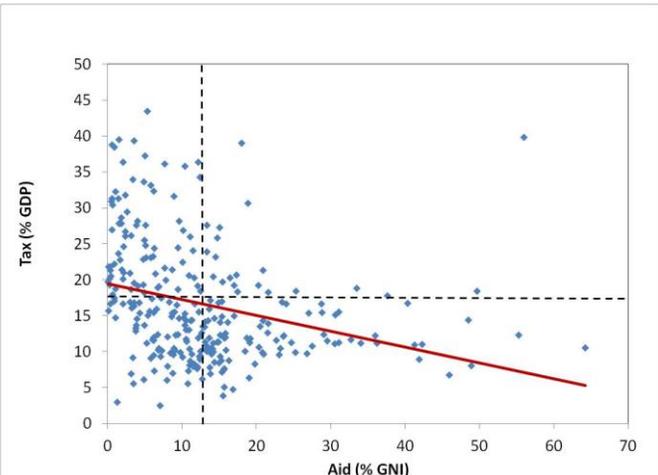
Empirical Results

Table 2 presents the first set of estimates for equation (1). The Hausman test provided strong evidence against the null hypothesis that there is no misspecification in the case of random effects for the different models estimated. As a result, fixed effects estimates with period dummies are reported, as well as panel corrected standard errors that account for both cross-section heteroscedasticity and autocorrelation.

Table 2: Aid and Taxation, Sub-Saharan Africa

Explanatory Variables	(1) GFS 1972-2008	(2) GFS 1972-2008	(3) GFS 1972-2008	(4) GFS 1972-2008	(5) KM 1980-2005	(6) KM 1980-2005	(7) KM 1980-2005	(8) KM 1980-2005
Constant	27.983**	−17.771	37.670**	-9.439	-11.727	-10.853	-11.864	-10.408
	(13.240)	(16.000)	(15.986)	(17.457)	(10.243)	(11.730)	(10.258)	(12.155)
log(GDPPC)	−1.323	3.772*	-2.583	3.120	5.131**	4.750**	5.070**	4.603**
	(1.815)	(2.006)	(2.124)	(2.287)	(1.521)	(1.869)	(1.531)	(1.952)
Aid (% GNI)	0.009	−0.012	0.021	0.008	0.053	0.047	0.054	0.012
	(0.076)	(0.068)	(0.094)	(0.079)	(0.046)	(0.069)	(0.045)	(0.068)
Agr (% GDP)	−0.247**	−0.094	-0.286**	-0.119*	-0.146**	-0.228**	-0.145**	-0.247**
	(0.077)	(0.073)	(0.084)	(0.069)	(0.026)	(0.040)	(0.026)	(0.039)
Trade	0.060*	0.145**	0.042	0.127**	0.011	0.054*	0.013	0.058*
	(0.034)	(0.037)	(0.040)	(0.036)	(0.019)	(0.032)	(0.018)	(0.032)
log(inflation)	-	−0.808	-	-1.158**	-	0.455	-	0.476
		(0.513)		(0.518)		(0.429)		(0.437)
log(debt)	-	1.816	-	1.239	-	0.289	-	0.536
		(1.264)		(1.301)		(0.862)		(0.847)
Democracy	-	0.280**	-	0.478**	-	-0.097	-	-0.099
		(0.126)		(0.159)		(0.076)		(0.076)
Conflict	-	-	0.785	1.629	-	-	1.831*	1.888
			(1.275)	(1.243)			(0.997)	(1.174)
#Observations	165	131	149	118	272	201	264	195
Adj. R-squared	0.78	0.86	0.79	0.87	0.85	0.83	0.85	0.83
#Countries	36	30	34	28	38	32	37	31

Note: Except where indicated otherwise, the figures in parentheses are the robust standard errors. *(**) indicates 10(5) per cent level of significance. Coefficients on time and country dummies not reported.

In the first four columns of table 2, we report the results when the GFS data is used, starting first with the baseline model (column 1), followed by the extended model (column 2), and then adding the conflict variable to each of these specifications (columns 3 and 4). In the last four columns of table 1, we repeat the exercise but using the KM tax data. Two results stand out. First, aid as a percentage of GNI has not had any significant impact on taxation. Second, the structure of the economy represented by agriculture as a share of GDP has a negatively significant impact on taxation as expected. Income per capita and openness to trade also seem to matter in several of the specifications.

Is sub-Saharan Africa different? In Table 3, we consider various regional groupings using GFS taxation data. Columns 1 and 2 are the same as the first two columns of Table 1 to facilitate comparison. Although there are differences in terms of magnitude as to how the structure of the economy, the rate of inflation, and the type of political regime are related to taxation, the impact of aid is not significant in most cases, column 8 excepted. An important caveat is that sample sizes are in some cases quite low, and hence the validity of the results must be viewed with caution. The conflict variable was not included in the above table as it did not change the results significantly. Furthermore, the results for the full sample, excluding high-income and OECD countries, did not change the results; agriculture as a share of GDP continued to have negatively significant impact on taxation while aid was not significant.

Table 3: Aid and Taxation, Regional Comparisons, 1972-2008

Explanatory Variables	(1) SSA	(2) SSA	(3) EASIA	(4) EASIA	(5) SASIA	(6) SASIA	(7) LAC	(8) LAC
Constant	27.983**	−17.771	7.951	-41.139	11.553	10.571	5.083	1.559
	(13.240)	(16.000)	(15.810)	(13.216)	(13.372)	(11.494)	(11.520)	(13.598)
log(GDPPC)	−1.323	3.772*	1.002	7.460**	1.182	0.820	1.513	1.237
	(1.815)	(2.006)	(1.982)	(1.844)	(2.179)	(1.946)	(1.504)	(1.508)
AID(%GNI)	0.009	−0.012	-0.223	-1.196	0.016	-0.008	0.212	-0.489**
	(0.076)	(0.068)	(0.196)	(0.204)	(0.110)	(0.150)	(0.179)	(0.238)
AGR (%GDP)	−0.247**	−0.094	0.063	0.256**	-0.216**	-0.082	-0.199	-0.392**
	(0.077)	(0.073)	(0.010)	(0.127)	(0.096)	(0.114)	(0.125)	(0.112)
Trade	0.060*	0.145**	0.001	0.032	-0.024	0.008	-0.003	0.051**
	(0.034)	(0.037)	(0.014)	(0.031)	(0.067)	(0.068)	(0.023)	(0.022)
log(inflation)	-	−0.808	-	-0.930*	-	-1.941	-	-0.501**
		(0.513)		(0.535)		(1.210)		(0.208)
log (debt)	-	1.816	-	0.842	-	0.453	-	1.685*
		(1.264)		(1.321)		(0.654)		(0.921)
Democracy	-	0.280**	-	-0.022	-	0.099*	-	-0.009
		(0.126)		(0.164)		(0.055)		(0.058)
#Observations	165	131	80	50	44	44	147	109
Adj. R-squared	0.78	0.86	0.68	0.87	0.87	0.88	0.83	0.78
#Countries	36	30	15	10	6	6	28	18

Note: Except where indicated otherwise, the figures in parentheses are the t-statistics. *(**) indicates 10(5) per cent level of significance. Coefficients on time and country dummies not reported.

Building on what was observed in table 1, and focusing on sub-Saharan African countries, we consider the different versions of the tax variable (KM1 and KM2 as defined above) to see whether aid has a differential impact on these taxes. In the first four columns of table 4, KM1 is the dependent variable, and in the next four columns, KM2 is the dependent variable.

Table 4: Aid and Taxation, Sub-Saharan Africa: Excluding Trade and Resource Taxes

Explanatory Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	KM1	KM1	KM1	KM1	KM2	KM2	KM2	KM2
Constant	-23.769**	−13.277	-23.911**	-13.275	1.735	-15.349**	1.780	-15.210**
	(9.475)	(9.109)	(9.328)	(10.284)	(7.643)	(6.762)	(7.342)	(7.170)
log(GDPPC)	6.417**	4.595**	6.338**	4.517**	1.555	3.743**	1.432	3.641**
	(1.374)	(1.503)	(1.382)	(1.666)	(1.033)	(0.930)	(0.988)	(0.963)
Aid (% GNI)	0.030	0.040	0.035	0.012	0.049	0.014	0.058	-0.013
	(0.045)	(0.048)	(0.043)	(0.048)	(0.043)	(0.043)	(0.041)	(0.040)
Agr (% GDP)	−0.187**	−0.215**	-0.184**	-0.230**	-0.087**	-0.170**	-0.080**	-0.186**
	(0.042)	(0.038)	(0.041)	(0.042)	(0.041)	(0.037)	(0.038)	(0.040)
Trade	0.010	0.038	0.011	0.040	-0.011	0.002	-0.011	-0.001
	(0.026)	(0.037)	(0.026)	(0.030)	(0.013)	(0.014)	(0.012)	(0.014)
log(inflation)	-	0.443	-	0.478	-	0.071	-	0.099
		(0.328)		(0.333)		(0.334)		(0.328)
log(debt)	-	0.026	-	0.241	-	1.668**	-	1.897**
		(0.751)		(0.757)		(0.608)		(0.617)
Democracy	-	-0.154**	-	-0.151**	-	-0.067*	-	-0.063
		(0.073)		(0.071)		(0.040)		(0.045)
Conflict	-	-	1.613	1.571	-	-	1.310	1.624
			(1.081)	(1.116)			(0.877)	(0.993)
#Observations	272	201	264	195	272	201	264	195
Adj. R-squared	0.82	0.85	0.83	0.86	0.77	0.76	0.77	0.83
#Countries	38	32	37	31	38	32	37	31

Note: Except where indicated otherwise, the figures in parentheses are the robust standard errors. *(**) indicates 10(5) per cent level of significance. Coefficients on time and country dummies not reported.

As we can see in table 4, aid remained insignificant when these different tax variables are considered while agriculture continued to be negatively significant. Countries with higher per capita incomes are able to draw more revenue from taxes as expected and we find some evidence that higher debt burdens may have induced governments to resort to higher taxes to finance them. A surprising result is the negative sign for the "democracy" variable which may be due to the fact that many of the countries in our sample were not democracies over that period; when a broader sample of developing countries is considered, the "democracy" variable is positively significant. Given that

trade taxes are excluded from table 4, the openness variable is no longer significant when compared to table 1. We also tested whether aid levels matter by considering different thresholds for aid: over 5 per cent and over 10 per cent. The results did not change (even if the sample size was reduced) - the structure of the economy represented by agriculture as a share of GDP remained highly negatively significant while aid remained insignificant.

To what extent could our results be biased by endogeneity (even if we lagged the independent variables by one period) in the relationship between aid and taxation? In particular, one could imagine situations where donors react to changes in taxation by adjusting their aid flows. Two scenarios are possible. In the first one, donors could provide more aid to countries whose tax revenues are declining in order to compensate for the shortfall in overall revenue so that OLS estimates would be biased upward. In the second one, donors could instead reward countries that show improvements in tax effort with more aid since they are also the ones less likely to waste it, so that OLS estimates would be biased downward. Either way, one should notice a systematic patter in the data (more on this below).

It should be noted that most aid allocation studies (for example, Alesina and Dollar, 2000; Berthelemy and Tichit, 2004) do not include taxation as a determinant of aid but rather focus on other economic needs proxied by per capita income or infant mortality rates, as well as political and economic interests. To explore whether endogeneity could be biasing our results, we first examined the impact of taxation on aid, controlling for income per capita and using the same set-up as before, namely variables averaged over four-year periods and lagged independent variables. Taxation (using either GFS data or KM data) was not a significant determinant of aid. Second, we considered year-on-year changes in taxation and aid to identify systematic patterns. In particular, we examined what happened to aid flows after three consecutive years of increases or declines in taxation as a percentage of GDP for sub-Saharan African using KM data There were 106 such episodes (68 "three consecutive-year" increases and 38 "three consecutive-year" decreases) over the period 1980-2005). Out of the 68 "positive" cases, aid flows went down right after the three-year period in 35 cases and up in 32 cases; there was no data on aid flows for one such episode. Out of the 38 "negative" cases, aid flows went up in 17 cases and down in 21 cases. There is thus no systematic response of aid flows to changes in taxation. Third, we used instrumental variables when estimating the baseline model with GFS, KM, KM1 and KM2 tax data as the dependent variables. More specifically, we used income and population at the beginning of each period as well as lagged values of aid as instruments (see Gupta et al. 2003, Brautigam and Knack, 2004). The two stage least squares results are shown

in Table 2A in the appendix; although per capita income and agriculture value added as a share of gdp remained significant, the aid variable continued to be insignificant.

Conclusion

The existing literature has generally found a negative relationship between aid and taxation but the results are very sensitive to data quality and specification problems. In this paper, we revisited the aid-taxation link by focusing on sub-Saharan Africa and by 1) drawing from some recent case studies and 2) empirically using more recent data as well as a new dataset by Keen and Mansour (2009), which allowed us to focus on revenues that require more state capacity to collect. Our review of the case studies indicates that despite significant recent reforms to both tax policy and administration, tax mobilization performance has been mixed, limited by structural factors including low per capita income and very shallow tax bases. There is significant variation in donor support for tax mobilization across our five case study countries as well as across Africa in general. Where donor support is high we see a clear preference for the autonomous revenue authority model, but the impact of this on performance is uncertain. Donor support for country tax efforts seems to have short-term impact on tax mobilization performance which countries find hard to sustain over time. Revenue foregone due to exemptions is a significant drain on DRM in all five of our case study countries. The capacity for developing countries to increase tax revenue during periods of donor withdrawal suggests that the domestic resource potential of sub-Saharan Africa may be greater than previously realized. With the exception of Cameroon, aid grants compose the largest proportion of overall revenue mobilization within our case study countries, a pattern that is different from Africa as a whole where resource related taxes in recent years have been the main driver of revenue performance. Empirically, controlling for the different determinants of taxation, we find that aid has had no significant impact on taxation generally or in sub-Saharan Africa particularly. What seems to matter most is the structure of the economy, rather than the amount of aid a country receives. It is noteworthy that even in regions that have received large amounts of aid over long periods such as Sub-Saharan Africa, aid does not seem to have a profound effect on taxation. In that sense, this region is not that different from other parts of the world that rely significantly on agriculture and which is harder to tax. These results are robust to different specifications, time periods, and aid thresholds.

More importantly, we also found no evidence that aid (at the aggregate level) has helped countries become more self-reliant through increased DRM. Perhaps this should be expected as aid is given for many reasons that have nothing to do with

improving the capacity of countries to mobilize resources domestically. However, we know from existing data that there are several countries whose dependency on aid has decreased over time (for example, Botswana, Mauritius, South Korea, Thailand and Tunisia), and among them are some that have also seen their taxation capacity grow over time. An interesting area for future research would be to examine how and why some countries have made this transition while others have not.

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Appendices

Table 1A: Correlation Matrix

	TAX	TAX_GDP1	TAX_GDP2	TAX_GDP3	LGDPPC	AID	AGR	TRADE	LINF	LDEBT	DEM	CONFLICT
TAX	1.00											
TAX_GDP1	0.71	1.00										
TAX_GDP2	0.25	0.71	1.00									
TAX_GDP3	0.47	0.28	0.45	1.00								
LGDPPC	0.31	0.51	0.65	0.32	1.00							
AID	-0.24	-0.26	-0.36	-0.35	-0.67	1.00						
AGR	-0.39	-0.61	-0.62	-0.26	-0.64	0.51	1.00					
TRADE	0.72	0.79	0.30	0.12	0.36	-0.19	-0.51	1.00				
LINF	0.21	0.13	-0.05	0.06	-0.02	0.09	0.09	0.12	1.00			
LDEBT	-0.18	-0.05	0.13	0.08	-0.14	0.24	0.07	-0.03	-0.17	1.00		
DEM	0.16	0.14	0.09	0.22	0.29	-0.15	-0.35	0.22	0.02	-0.05	1.00	
CONFLICT	-0.17	-0.23	-0.18	-0.05	-0.37	0.28	0.44	-0.33	0.07	-0.07	-0.21	1.00

Table 2A: Aid and Taxation, Sub-Saharan Africa: 2SLS Estimates of Baseline Models

Explanatory Variables	(1)	(2)	(3)	(4)
	GFS	KM	KM1	KM2
Constant	-20.999	−16.756	-29.913**	-2.615
	(14.960)	(10.844)	(9.769)	(8.702)
log(GDPPC)	-0.405**	5.797**	7.235**	2.149*
	(2.071)	(1.591)	(1.398)	(1.186)
Aid (% GNI)	0.028	0.067	0.030	0.046
	(0.045)	(0.050)	(0.048)	(0.047)
Agr (% GDP)	−0.218**	−0.143**	-0.153**	-0.074*
	(0.087)	(0.028)	(0.045)	(0.044)
Trade	0.066*	0.025	0.014	-0.003
	(0.037)	(0.020)	(0.026)	(0.014)
#Observations	147	262	262	262
#Countries	36	38	38	38

Note: Except where indicated otherwise, the figures in parentheses are the robust standard errors. *(**) indicates 10(5) per cent level of significance. Coefficients on time and country dummies not reported.