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Tax Effort in Sub-Saharan Africa

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Abstract

Many sub-Saharan African countries face difficulty in raising tax revenue for public purposes. This study uses panel data on 43 sub-Saharan African countries during 1990–95 to measure the determinants of the tax share in GDP and to construct a measure of tax effort. The analysis suggests that the countries with a relatively high tax share tend to have a relatively high index of tax effort, although these results are not uniform across the countries. The results can be used to provide guidance on to the proper mix of fiscal policy in the event of budgetary imbalance.

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CONTENTS

SUMMARY

Many sub-Saharan African countries face difficulty in raising tax revenue for public purposes. Low per capita incomes, an economic base in subsistence agriculture, poorly structured tax systems, and weak tax and customs administrations all contribute to difficulties in raising tax revenues.

This study uses panel data on 43 sub-Saharan African countries during 1990–95 to measure the determinants of the tax share in GDP and to construct a measure of tax effort. The results indicate the extent to which countries make use of their potential tax bases to raise revenues and they can be used to provide guidance on the proper mix of fiscal policy in the event of budgetary imbalance.

For 30 countries for which data on sectoral shares in value added are available, the analysis suggests that the shares of agriculture in GDP and mining in GDP are both negative and significantly related to the tax share, and that the export shares in GDP and per capita income are both positive and significantly related to the tax share. For 43 countries for which complete data on agricultural share in value added alone is available, the share of agriculture in GDP is again negative and significant, export share in GDP is again positive and significant, per capita income is not significant, and import share is positive and significant in some variants. No strong link between Fund programs and tax shares is found, on average.

The measure of tax effort is constructed as the ratio of the actual tax share to the predicted (or potential) tax share. The results suggest that the countries with a relatively high tax share tend to have a relatively high tax index, although these results are not uniform across the countries.

I. Introduction

Many developing countries face difficulty in generating sufficient revenues for public purposes. In sub-Saharan African countries, public sector budgets that are chronically short of funds and the unproductive use of public expenditures have limited the critical investments in both human resources and capital infrastructure that are necessary for providing a basis for sustainable economic growth.[2] Programs supported by the International Monetary Fund (Fund) in sub-Saharan African countries may involve measures to raise tax revenues and to restructure tax systems in these countries.

This study uses panel data on 43 sub-Saharan African countries over the 1990–95 period to examine the determinants of tax revenue shares and to construct an index of tax effort for these countries. The index of tax effort is constructed as the ratio of actual tax share to the predicted (or potential) tax share, as in previous work on this topic. The results suggest that the countries with a relatively high tax share tend to have a relatively high tax index, though these results are not uniform across the countries. The tax effort indices are relatively stable over the 1990–95 period, though many countries have an upward or downward trend.

The results indicate the extent to which countries make use of their potential tax bases to raise revenues and they can be used to provide guidance as to the proper mix of fiscal policy to undertake in the event of a budgetary imbalance.

Section II summarizes revenue performance in sub-Saharan Africa. Section III explains the different approaches that have been used to examine the determinants of tax share and to measure tax effort, and reviews previous empirical work on this topic. Section IV presents the results using the panel data sets. Section V concludes.

II. Revenue Performance in Sub-Saharan Africa

A. Tax shares

Revenue performance varies across sub-Saharan African countries. In the 46 sub-Saharan African countries,[3] the share of tax revenue in GDP was on average 15.7 percent in 1995 (see Table 1). In these countries, in 1995, the share of tax revenue in GDP was above 30 percent in only 3 countries, between 20 and 30 percent in 8 countries, between 10 and 20 percent in

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[2]In a study of sub-Saharan African countries, Ghura and Hadjimichael (1996) link higher budget deficits as a share of GDP to slower growth.

[3]Liberia and Somalia are excluded owing to missing data as a result of civil disruptions in this period.

Table 1. Sub-Saharan African Countries: Tax Revenue 1/
(In percent of GDP)

	1990	1991	1992	1993	1994	1995	Average 1990-95
Angola	22.40	14.82	25.30	36.98	39.16	28.01	27.78
Benin 2/ 3/	7.89	8.82	10.03	10.94	10.74	11.88	10.05
Botswana 4/	39.84	36.93	36.98	33.08	28.97	27.00	33.80
Burkina Faso 2/ 3/	10.15	10.13	8.69	9.28	10.10	10.95	9.88
Burundi 2/	13.10	14.87	14.49	14.86	15.85	17.81	15.16
Cameroon 2/ 3/ 5/	9.60	10.16	9.55	7.76	9.86	10.62	9.59
Cape Verde	10.99	13.63	15.58	17.92	19.65	19.89	16.28
Central African Republic 2/ 3/	10.63	8.61	8.52	7.43	6.46	8.65	8.38
Chad 2/ 3/	7.89	5.94	6.28	6.42	5.62	7.44	6.60
Comoros 2/	12.05	10.94	12.90	12.64	12.64	12.26	12.24
Congo 2/ 3/ 5/	16.92	16.30	14.27	11.13	8.09	12.95	13.28
Côte d'Ivoire 2/ 3/	17.56	16.89	16.93	14.77	16.41	17.83	16.73
Djibouti	25.42	24.19	25.38	26.82	28.09	26.76	26.11
Equatorial Guinea 2/ 3/ 5/	14.31	13.49	14.12	13.92	10.88	9.27	12.67
Eritrea 2/	--	--	12.40	16.65	14.92	15.29	14.81
Ethiopia 2/ 4/	10.36	7.97	8.21	10.72	12.51	12.37	10.36
Gabon 3/ 5/	12.88	16.63	16.21	15.59	15.55	20.75	16.27
Gambia, The 2/ 4/	19.83	20.44	21.82	20.02	17.45	...	19.91
Ghana 2/	10.81	12.41	10.03	12.89	16.99	15.03	13.03
Guinea 2/ 6/	14.57	13.80	12.49	10.79	9.62	10.33	11.93
Guinea-Bissau 2/	7.99	6.48	3.91	4.97	6.83	6.91	6.18
Kenya 2/ 4/	20.10	19.82	20.00	24.46	25.02	25.97	22.56
Lesotho 4/	34.04	37.15	40.24	43.00	41.66	39.06	39.19
Madagascar 2/	9.43	6.85	8.66	8.16	7.69	8.13	8.15
Malawi 2/ 4/	16.66	16.34	15.53	14.79	14.50	15.29	15.52
Mali 2/ 3/	9.79	12.08	10.35	11.08	10.04	10.68	10.67
Mauritania 2/	18.34	16.55	16.46	19.05	17.91	17.01	17.55
Mauritius 4/	21.65	19.96	19.31	19.19	16.91	15.96	18.83
Mozambique 2/	19.87	18.48	18.36	18.21	16.15	16.69	17.96
Namibia 4/	27.44	32.19	30.74	31.33	29.57	30.80	30.34
Niger 2/ 3/	7.92	7.02	6.83	6.58	5.43	6.62	6.73
Nigeria 7/	10.35	8.35	8.21	7.28	5.70	7.00	7.82
Rwanda 2/	9.86	10.95	8.88	8.41	3.51	6.63	8.04
São Tomé and Príncipe 2/	9.36	10.23	13.36	13.04	9.99	9.79	10.96
Senegal 2/ 3/ 8/	15.56	16.70	15.32	13.88	12.43	13.59	14.58
Seychelles	38.26	34.29	34.53	36.57	34.07	28.93	34.44
Sierra Leone 2/ 4/	9.56	11.65	13.29	13.59	10.13	9.17	11.23
South Africa 4/	24.84	23.80	23.16	23.86	24.74	24.86	24.21
Sudan 4/	5.00	5.56	6.85	6.34	6.96	6.87	6.26
Swaziland 4/	30.08	30.02	27.99	28.02	29.15	32.76	29.67
Tanzania 2/ 4/	13.97	14.84	11.42	13.47	12.25	12.80	13.13
Togo 2/ 3/	18.65	15.23	12.64	9.00	11.76	13.76	13.51
Uganda 2/ 4/	7.32	6.29	6.69	7.76	9.22	9.69	7.83
Zaïre	9.29	4.39	2.73	3.41	2.93	4.06	4.47
Zambia 2/	19.92	18.30	17.53	13.85	16.85	15.50	16.99
Zimbabwe 4/	30.48	33.26	27.63	26.72	24.98	24.30	27.89
Unweighted average all countries	16.29	15.86	15.67	16.01	15.56	15.73	15.86
Unweighted average SPA countries	13.00	12.54	11.91	11.66	11.60	11.85	12.38
Unweighted average CFAF Zone Countries	12.29	12.16	11.52	10.60	10.26	11.92	11.46

Sources: Data provided by the country authorities; and Fund staff estimates.

1/ Excluding Liberia and Somalia.
2/ Special program of assistance countries (SPA).
3/ CFA franc zone countries.
4/ Fiscal year.
5/ Including tax revenue from oil.
6/ Including mining sector revenue.
7/ Data exclude royalty and direct profit income from petroleum production.
8/ Fiscal year ending June 30, through 1991/92; calendar year data starting in 1992.

22 countries, and below 10 percent in the remaining countries.[4] The tax revenue share in GDP is somewhat lower in Special Program of Assistance (SPA) countries,[5] averaging 11.9 percent in 1995, and in Communauté Financière de l'Afrique (CFA) franc zone countries,[6] averaging 11.9 percent in 1995. Revenue trends are not uniform across these sub-Saharan African countries. Some countries have enjoyed sustained increases in tax revenue shares in recent years while others have seen tax revenue shares weaken. The most recent evidence suggests that tax revenue shares are on average beginning to strengthen.

Tax shares in developing countries tend to be lower than in industrialized countries (see Tanzi, 1992). In fact, the tax shares in sub-Saharan African countries were higher on average than in Asia and the Middle East and North Africa in recent decades (see WoldeMariam, 1995). In OECD countries, the share of tax revenue in GDP was on average 38.4 percent (28.2 percent without social security taxes) in 1994, though there is considerable variation, with the share of tax revenue ranging from 28.9 percent in Australia to 51.0 percent in Sweden.[7]

African countries use a broad spectrum of taxes (see Table 2). Taxes on goods and services comprised the largest share of taxes in 1995, accounting for 5.2 percent of GDP. International trade taxes accounted for 5.0 percent of GDP and taxes on income and profits accounted for 4.6 percent.

B. Determinants of tax shares

There are several reasons for the relatively low share of tax revenue in GDP in sub-Saharan Africa, though any generalization is difficult given the differences in the political and economic structures across these countries. The economies of sub-Saharan Africa are mainly characterized by low per capita income and based on subsistence agriculture, which is difficult to tax. The formal sector, which is generally easier to tax, often consists mainly of the public sector (including public enterprises). It is often limited to some large-scale farms producing agricultural products for export, mineral and petroleum extraction, some large-scale manufacturing enterprises, such as for beer, nonalcoholic drinks, tobacco, and other commodities; and some small-scale manufacturing and retailing. To the extent that the formal sector buys from the informal sector, this may also impair the administrability of the tax system. Some of these sub-Saharan African countries have experienced repeated and severe internal unrest, including civil wars, which has also impaired revenue collections. The presence

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[4]The figure for The Gambia refers to 1994 owing to missing data.

[5]The SPA countries are listed in Appendix I.

[6]The CFA franc zone countries have a common monetary policy. These countries are listed in Appendix I.

[7]Organization for Economic Cooperation and Development (1996).

Table 2. Sub-Saharan African Countries: Tax Structure, 1995 1/

(In percent of GDP)

	Total Revenue	Tax Revenue	Other Revenue	Taxes on Income, Profits, and Capital Gains			Domestic Taxes on Goods and Services 2/			International Trade Taxes 2/		
					of which:			of which:			of which:	
				Total	Individual	Corporate	Total	General sales, turnover or VAT	Excises	Total	Import duties	Export duties
Angola	28.30	28.01	0.29	19.55	0.68	18.87	6.43	--	5.76	1.38	--	--
Benin 3/ 4/	14.40	11.88	2.52	3.88	0.85	2.50	1.85	1.01	0.34	5.82	5.44	0.03
Botswana 5/	36.48	27.00	9.49	7.73	1.43	6.30	1.57	1.47	0.10	5.58	5.58	0.00
Burkina Faso 3/ 4/	11.88	10.95	0.93	2.55	1.06	1.38	3.68	2.77	0.29	4.47	4.47	0.00
Burundi 3/	18.83	17.81	1.02	3.62	1.62	1.74	7.09	2.75	4.26	6.98	2.98	3.92
Cameroon 3/ 4/ 6/	14.33	10.62	3.71	1.43	0.00	1.43	2.82	1.14	1.09	2.75	2.58	0.17
Cape Verde	26.08	19.89	6.20	6.62	1.89	3.35	3.34	--	3.34	8.38	8.24	--
Central African Republic 3/ 4/	9.06	8.65	0.40	1.86	0.86	0.76	2.94	0.62	0.30	3.85	3.15	0.70
Chad 3/ 4/	8.40	7.44	0.96	2.92	1.35	1.57	1.23	0.32	0.38	2.28	1.80	0.27
Comoros 3/	14.22	12.26	1.95	1.74	0.59	1.09	3.47	1.17	2.30	2.47	1.15	0.38
Congo 3/ 4/ 6/	24.84	12.95	11.89	3.13	1.48	1.64	3.76	2.46	1.29	4.76	4.76	...
Côte d'Ivoire 3/ 4/	21.92	17.83	4.09	4.02	1.37	1.81	7.54	4.50	2.32	6.28	2.75	3.52
Djibouti	28.38	26.76	1.61	10.72	3.60	1.92	8.93	8.93	...	5.53	...	...
Equatorial Guinea 3/ 4/ 6/	14.85	9.27	5.58	0.42	...	...	3.59	2.15	...	4.33	1.57	2.76
Eritrea 3/	28.73	15.29	13.45	7.26	1.58	3.95	5.12	5.12	...	2.91	2.91	--
Ethiopia 3/ 5/	17.88	12.37	5.51	4.29	0.86	2.57	5.17	3.79	0.26	2.63	2.32	0.31
Gabon 3/ 6/	28.61	20.75	7.86	3.01	1.34	1.67	2.42	2.02	...	5.04	4.33	...
Gambia, The 3/ 5/ 7/	19.46	17.45	2.02	3.95	1.61	2.14	9.29	4.34	4.94	4.21	4.21	...
Ghana 3/	22.31	15.03	7.29	3.63	1.07	2.07	6.65	2.77	3.88	4.75	2.67	2.07
Guinea 3/ 8/	11.02	10.33	0.69	1.01	0.57	0.29	4.70	1.44	2.37	1.59	1.50	0.02
Guinea-Bissau 3/	12.65	6.91	5.74	1.00	0.26	0.61	2.13	2.07	0.06	3.46	1.31	0.56
Kenya 3/ 5/	29.18	25.97	3.21	9.64	...	...	12.09	5.70	6.39	4.25	4.25	...
Lesotho 5/	46.47	39.06	7.41	7.62	5.39	2.05	6.10	4.81	...	25.06	25.05	0.01
Madagascar 3/	8.31	8.13	0.18	1.20	0.41	0.61	4.18	3.74	0.01	2.60	2.27	0.33
Malawi 3/ 5/	17.60	15.29	2.31	...	...	...	8.00	...	...	7.29	...	0.00
Mali 3/ 4/	14.40	10.68	3.72	2.16	1.15	0.88	2.96	2.81	...	4.35	4.02	0.12
Mauritania 3/	23.96	17.01	6.96	5.89	2.82	2.79	5.43	3.46	1.80	5.39	3.41	1.98
Mauritius 5/	17.52	15.96	1.56	2.74	1.38	1.36	5.15	...	...	6.80	6.80	...
Mozambique 3/	18.29	16.69	1.60	3.03	1.64	1.39	8.73	5.13	3.60	4.40	3.16	0.00
Namibia 5/	34.32	30.80	3.53	9.42	5.83	3.32	10.94	7.45	2.64	9.82	...	0.03
Niger 3/ 4/	7.23	6.62	0.62	1.93	...	...	1.29	...	...	3.12	...	...
Nigeria 9/	23.00	7.00	16.00	1.40	1.40	...	5.60	1.40	2.90	...	...	...
Rwanda 3/	7.05	6.63	0.43	0.82	0.49	0.24	3.02	0.92	1.74	2.75	2.11	0.55
São Tomé and Príncipe 3/	16.54	9.79	6.74	2.33	0.92	1.28	2.85	2.85	...	3.98	3.02	0.95
Senegal 3/ 4/ 10/	13.99	13.59	0.40	3.09	1.97	0.85	3.44	3.03	0.16	6.41	6.41	...
Seychelles	40.01	28.93	11.07	5.29	...	...	20.33 11/	...	1.29	...	...	...
Sierra Leone 3/ 5/	9.40	9.17	0.23	1.36	0.72	0.64	5.05	2.41	1.90	2.56	4.61	...
South Africa 5/	25.66	24.86	0.80	13.67	10.24	3.42	9.61	6.52	1.31	1.26	1.22	...
Sudan 5/	8.69	6.87	1.83	2.49	0.17	1.99	1.66	0.24	1.42	2.52	1.43	0.19
Swaziland 5/	33.69	32.76	0.94	9.44	4.04	4.83	5.36	4.16	...	17.88	...	...
Tanzania 3/ 5/	14.95	12.80	2.15	3.74	1.08	1.71	5.44	3.10	2.34	2.04	2.04	...
Togo 3/ 4/	15.05	13.76	1.28	6.23	1.44	0.80	1.72	0.85	0.70	5.61	4.59	...
Uganda 3/ 5/	10.32	9.69	0.63	1.36	...	...	3.77	2.67	1.10	4.54	3.72	...
Zaïre	4.41	4.06	0.34	0.97	0.31	0.32	0.96	0.47	0.49	1.20	1.09	0.10
Zambia 3/	16.92	15.50	1.42	4.90	3.81	1.09	5.46	3.06	2.40	4.63	...	...
Zimbabwe 5/	28.49	24.30	4.19	12.28	6.76	4.29	5.95	4.60	1.35	5.62	5.62	...
Unweighted average all countries	19.52	15.77	3.76	4.61	1.81	1.78	5.18	2.86	1.70	4.97	3.81	0.76
Unweighted average SPA countries	15.74	12.53	3.21	3.04	1.01	1.22	4.66	2.46	1.71	4.11	2.97	0.75
Unweighted average CFAF Zone Countries	15.30	11.92	3.38	2.82	0.99	1.18	3.02	1.82	0.53	4.54	3.53	0.58

Sources: Data provided by the country authorities; and Fund staff estimates.

1/ Excluding Liberia and Somalia.
2/ For differentiating the taxes we have used Recent Economic Developments (REDs) except we have reclassified any clearly identified indirect taxes on imports from taxes on international trade to domestic taxes on goods and services.
3/ Special program of assistance countries (SPA).
4/ CFA franc zone countries.
5/ Fiscal year.
6/ Including tax revenue from oil.
7/ Data refer to 1994.
8/ Refers to mining sector revenue.
9/ Data exclude royalty and direct profit income from petroleum production.
10/ Fiscal year ending June 30, through 1991/92; calendar year data starting in 1992.
11/ The trade and service tax replaced import duties, excise taxes, and turnover taxes in 1986; however, payment of certain turnover liabilities were deferred through 1991.

of large inefficient state-owned enterprises, few large private sector taxpayers, and hesitation to collect taxes from elites may also limit revenue collections.

Apart from general economic and political weaknesses, the tax structure in many sub-Saharan African countries has impaired the efficiency of resource allocation in the economy and incentives for growth, and has limited the ability to raise tax revenues (see Heller, 1997; and Aguirre, Griffith, and Yücelik, 1981). These weaknesses are apparent in all areas of the tax system (see Heller, pp. 42–43). International trade taxes are typically characterized by an excessive number of nominal tariff rates, high rates, and numerous exemptions, resulting in significant dispersion in the rate of effective protection. Customs structures protect industries, leading to lower incentives to produce efficiently, and limiting economic growth. Export taxes and misvalued or multiple exchange rates also distort domestic incentives for production. Marketing boards that pay farmers below market prices for crops may impose significant implicit taxes, which are not recorded as tax revenue. Domestic taxes are also poorly structured in many sub-Saharan African countries. Indirect taxes, such as the value-added tax (VAT) or other broad-based sales taxes, often have multiple rates, apply to only a limited number of sectors, and have extensive exemptions (both within and outside of the tax law), leading to cascading and distortion in economic incentives. Enterprise income taxes are often limited to the formal sector and are often characterized by high marginal tax rates and narrow tax bases because of extensive tax incentives. Multinational businesses often pay a disproportionate share of VAT and enterprise income taxes compared to local businesses. Personal income taxes are almost exclusively applied to wage income in the formal sector (typically government employment) and are often unwieldy, with high marginal tax rates.

In addition to poor tax structures, many sub-Saharan African countries are characterized by weak tax and customs administrations, which impair efforts to raise revenues (see Heller, pp. 42–43). Tax and customs administrations in these countries typically have excessive numbers of poorly trained and supervised staff, weak management practices, low salaries, and inadequate equipment and supplies. Discretion in the application of the tax and customs law, owing to weak domestic legal structures, creates opportunities for corruption and tax and customs fraud.

Some countries in sub-Saharan Africa have made progress in improving their tax systems in recent years. A forthcoming Fund study[8] found that several African countries were able to increase their tax revenue shares in the context of Fund programs. Benin, for instance, has undertaken a comprehensive program of reform of both tax policy and tax administration, resulting in a significant improvement in the structure of its tax system and an increase in the tax share to GDP ratio in recent years from very low levels (see Table 1).

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[8]Abed et al. (1997).

III. International Comparisons of Tax Effort

One purpose of international comparisons of tax effort is to reveal whether a country is limited in its revenue collections by a low capacity to generate revenues or by an unwillingness to use the available tax capacity to fund public services. Another purpose is to give guidance as to the proper mix of fiscal policy to undertake in the event of a budgetary imbalance. If a country facing an imbalance is already making the maximum use of its taxable capacity, this would suggest that correction of the imbalance would require expenditure reductions rather than tax increases.

A. Approaches to comparing tax effort

There are two main approaches normally used to make international comparisons of tax effort. In its simplest form, these comparisons are based on differences in the ratio of taxes in a country to measures of the tax base, often GDP. This approach assumes, however, that the tax base that is used for these comparisons is a proper measure of taxable capacity. Typically, a simple tax base, such as GDP, is not sufficient as a measure of taxable capacity, as not all taxes are linked explicitly to income, and the distribution of income and how income is earned (e.g., primarily in agriculture or the informal sector) also influence taxable capacity.

One variant of the approach measures taxable capacity by regressing for a sample of countries the tax revenue to GDP ratio on explanatory variables that serve as proxies for possible tax bases and other factors that might affect a country's ability to raise tax revenues. This regression approach has been applied to samples of developing and industrialized countries (see Tanzi, 1992; Leuthold, 1991; Tanzi, 1987; Tanzi, 1981; Tait, Grätz, and Eichengreen, 1979; Tait and Eichengreen, 1978; Chelliah, Baas, and Kelly, 1975; Chelliah, 1971; Bahl, 1971; Lotz and Morss, 1967). The predicted tax ratio from such a regression is considered a measure of "taxable capacity," while the regression coefficients can be interpreted as "average" effective rates on those bases. The ratio of the actual to the predicted tax ratios is then computed and used as an index of "tax effort."

An alternative is to calculate average effective tax rates for a sample of countries and to apply them to a standard set of tax bases for those countries (see Tanzi, 1981; Tait and Eichengreen, 1978; Bahl, 1972). This measures the tax that would be collected if a country applied 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 an alternative index of "tax effort." This approach has also been used to measure tax effort in the United States and Canada for fiscal redistribution purposes. Tanzi (1968) has proposed a related approach for making international tax comparisons, which is based on variation in tax ratios between U.S. states.

There are conceptual similarities and differences between these two general approaches. In both cases, tax effort is defined as a ratio of tax revenues to some measure of taxable capacity. They also assume that the tax bases and other explanatory variables reflect only differences in taxable capacity and not tax effort. This is unfortunately a rather strong assumption. It is

perhaps implausible that tax bases and other economic characteristics do not also reflect the demand for public spending (hence public revenues) so that the measure is not simply one of tax capacity (see Tanzi, 1992). One advantage of the regression approach is that in principle it controls the measure of taxable capacity for factors other than tax bases, while the average tax system approach does not.

B. Variables used as determinants of tax shares

In previous work, the principal determinants of the tax share in GDP (or GNP) are presumed to include inter alia the sectoral composition of value added; the overall level of industrial development; and the importance of international trade in the economy. The sectoral composition of value added is likely to be an important influence on the tax share because some sectors of an economy are more amenable to taxation and generate different taxable surpluses. For developing countries, the share of agriculture in the economy may be an important determinant of taxable capacity because small farmers are notoriously difficult to tax and subsistence agriculture (which is generally associated with a large share of agriculture in the economy) does not generate large taxable surpluses. Many countries are unwilling to tax the main foods that are used for subsistence. To some extent, however, a large share of agriculture may reflect an export industry in certain crops, which might be more amenable to taxation. Generally, however, in countries where agriculture is highly productive as an industry, the share of agriculture in the economy is relatively small. The mining share may be important as mining can generate large taxable surpluses. In most countries, there are usually only a few large firms engaged in mining, which facilitates tax administration. Nevertheless, since foreign investment in mining and oil extraction is common, countries may give significant tax concessions to foreign investors, limiting potential revenue collections from this source (though they may collect substantial revenues in the form of transfers to the budget, as, for example, in Nigeria). The share of manufacturing may also be important as manufacturing enterprises are typically easier to tax than agriculture since business owners typically keep better books and records and manufacturing can generate large taxable surpluses if production is efficient. Unfortunately, it is difficult to separate demand and supply-side factors. Agricultural societies generally demand lower levels of public services while those with a more advanced industrial structure demand higher levels. Thus, it may be inappropriate to interpret the composition of GDP variables as reflecting only supply-side factors (see Tanzi, 1992).

Per capita income is typically considered the best proxy for the overall level of development. This factor may have explanatory power beyond sectoral shares, though these factors are usually linked to each other, since the share of services and industry increases with the level of development and income. One problem with using nominal magnitudes in a cross-country analysis is that they must be converted into a common currency, such as the U.S. dollar. If exchange rates do not reflect purchasing power parities, then comparisons based on a common currency may be skewed, though if there is some systematic skewing across the countries then this may not bias the results. One possibility, however, is to convert the

nominal magnitudes into a common currency using purchasing power corrected exchange rates.

The share of international trade in the economy is a measure of openness. Certain features of international trade make it more amenable to taxation than domestic activities. In developing countries, the international trade sector is typically the most monetized sector of the economy. Entrance and exit to the country takes place in specified locations. Thus import or export shares could be an important determinant of tax share.

C. Previous empirical work

A number of empirical studies have attempted to assess the importance of these structural features (see Table 3). Chelliah, Baas, and Kelly (1975) relate the tax share in GNP to various combinations of explanatory variables, using a sample of 47 countries averaged over the 1969–71 period. They obtain the best fit using the agricultural share, mining share, and export ratio in GNP as explanatory variables. They find that mining is positively related to the tax share while agriculture is negatively related and the export ratio is insignificant. To estimate values of the tax effort index, they use the same variables as in Chelliah (1971). These variables are per capita nonexport income, the share of mining in GDP, and the share of nonmineral exports in GNP. They find that, in general, countries with a high share of tax revenue in GNP also tend to have a high index, but these results are not uniform. Some countries have a high tax effort but not high tax shares and vice versa. Over time, there appears to be consistency in the tax effort measures, though the tax effort index changes considerably in some countries, compared to the earlier study.

Updating the earlier work, Tait, Grätz, and Eichengreen (1979) use the same sample of 47 developing countries with data averaged over the 1972–76 period (or a three-year period when the data are not available for the full five years). They find stability in the results compared to the earlier studies. Overall, their results suggest that the Chelliah, Baas, and Kelly specifications are appropriate, using either nonexport income per capita, the share of mining, and the share of nonmineral exports in GNP as explanatory variables or nonexport income per capita and the share of exports in GNP as explanatory variables. They do not find that the share of agriculture is significant. Their measure of the tax effort indices also produces similar results to the earlier study. Countries with tax ratios that are above average tend to have tax indices that are above average and vice versa. They also find stability in the rankings of countries over time.

Using a similar framework to Tait, Grätz, and Eichengreen, Tanzi (1981) calculates tax effort indices for a sample of 34 sub-Saharan African countries in fiscal year 1977. He finds that the mining share and nonmineral export shares are positive and significant. He finds the highest tax effort in Togo and the lowest in Uganda among the countries in the study.

Tanzi (1987) examines, for a sample of 86 developing countries, how the share of tax revenue in GDP is related to the logarithm of per capita income. He finds a positive and significant

Table 3. Significant Variables in Previous Empirical Studies

Variables	Chelliah, Baas, and Kelly (1975)	Tait, Grätz, and Eichengreen (1979)	Tanzi (1992)	Leuthold (1991)
Agricultural share	-		-	-
Mining share	+	+		
Manufacturing share				
Export share				
Import share			+	
Per capita income				
Nonmineral export share		+		
Nonexport income per capita				
Foreign debt share			+	
Foreign trade share				+

Source: See references.

relationship between these two. He examines in detail the determinants of the shares of different components of the tax system. In a subsequent study, Tanzi (1992) extends this analysis to incorporate a specific time dimension by analyzing a series of cross sections. For a sample of 83 developing countries over the period 1978–88, he finds that the relationship between tax share and per capita income weakens. He hypothesizes that other factors, such as macroeconomic instability, the need to service debt, and the changing structure of the economy, have become more important determinants. He estimates an alternative specification that relates the tax share in GDP to the agriculture share in GDP, the share of imports in GDP, the foreign debt share in GDP, and per capita income. He finds that the share of agriculture in GDP is strongly inversely related to the tax share and its explanatory power is greater than per capita income. He also finds that import share and debt share are important determinants of tax share.

Leuthold (1991) uses panel data on eight sub-Saharan African countries over the 1973 to 1981 period to estimate a version of this model. She finds that agriculture share is inversely related to tax share and foreign trade is directly related to tax share. She finds that Tanzania and Kenya are high tax effort countries while Cameroon and Mali are low tax effort countries.

IV. Analysis using Sub-Saharan African Countries

A. The regression model

This study uses regression analysis to investigate the determinants of tax effort in sub-Saharan Africa (as outlined in Section III). It employs a data set constructed entirely of countries in sub-Saharan Africa (excluding Liberia and Somalia) during the 1990–95 period. A benefit of using only sub-Saharan African countries is that the sample is composed of countries that tend to have similar economic characteristics, though even among these countries, there are many political, economic, and social differences. The choice of sample is partly motivated by the need to obtain a data set where the variables can be measured in a relatively reliable and consistent manner. In addition, this study only uses ratios to GDP. GDP includes income earned locally that accrues to nonresidents and excludes income received from abroad by residents, whereas GNP excludes the former and includes the latter. Since local income accruing to nonresidents typically is taxed while remittances from abroad typically are not, GDP produces a more accurate measure of taxable capacity. Appendix I provides a description of the data set and summary statistics of economic characteristics for the sample of 46 countries. This study uses a cross-section, time-series data set, rather than cross-section or averaged cross-section data, thereby taking advantage of explanatory variables that vary both by unit of observation (the country) and time.[9]

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[9]See Hsiao (1986) for a discussion of issues related to panel data estimation.

The factors hypothesized to determine the tax share in GDP are the share of agriculture, the share of mining, the share of manufacturing, per capita income (converted into constant 1990 U.S. dollars, using both market exchange rates and purchasing power corrected exchange rates), the share of exports in GDP, and the share of imports in GDP.[10] In contrast to the previous studies, this study investigates how Fund programs alter the tax share. It is difficult to capture the effect of Fund programs precisely because Fund programs are diverse in their objectives. Most Fund programs focus on improvements in the fiscal balance since fiscal problems are so often at the heart of loss of macroeconomic control. Some programs aim to increase the tax share while others do not, instead focusing on retrenchment of government expenditures. Some programs that aim to increase tax share also emphasize some initial restructuring of taxes that may be revenue-losing in the short run. In addition, some Fund programs run to completion while others are not sustained past an initial drawing. It is thus difficult to capture the effect of Fund programs in a quantitative variable that can be used in regression analysis. Nonetheless, several different specifications were examined to incorporate the effect of Fund programs into the analysis. A simple specification is to include a simple zero-one dummy variable for countries with a program with the Fund. This variable may, however, be a poor representation of the effect of Fund programs for those programs that did not intend to raise the tax revenue share or were short-lived. An alternative specification is to add a variable into the regression representing the "target" tax share under the Fund program.[11] The relationship between this target and the actual tax share would be expected to be positive. This relationship is likely to be stronger when a specific goal of the Fund program is to increase the tax share. This variable is interacted with time dummy variables to examine separately the influence of the Fund target on the tax share for each year of the sample (mainly this was done to capture any changes in the influence of the Fund target over time). This variable is also not an ideal representation of the effect of Fund programs and any results should be cautiously interpreted.[12]

Owing to data limitations, two different samples of countries are constructed. About one-third of the countries in the sample are missing data on either the mining or manufacturing shares. As a consequence, to examine the influence of the sectoral shares of agriculture, mining, and manufacturing on the tax share, the sample size is reduced to 30 countries that have complete data for these sectoral shares (as well as other variables). Since it is desirable to construct a

---

[10]Five countries (Cameroon, the Congo, Equatorial Guinea, Gabon, and Nigeria) have significant revenues from oil, which may be classified separately from tax revenues. The analysis maintains the same division of revenues into tax and nontax components as in the country documents.

Nonmineral exports were not available as a variable in this data set.

[11]This target may be either a formal program target or a fiscal projection under the program.

[12]There may also be some potential endogeneity in that countries with low tax shares (or diminishing) are more likely to have a Fund program.

measure of the tax effort index for all countries in sub-Saharan Africa, an alternative sample is constructed, in which only the agricultural share is used as a measure of sectoral composition of value added, increasing the sample size to 43 countries. For a few countries, data are missing for only one or two years of the panel so that an unbalanced panel data set is used, with these countries included only for the available years of observations. Three countries (Eritrea, Mozambique, and Zaïre) are dropped from the analysis in both variations because of missing or irregular data for some of the variables over the sample period.

B. Empirical results

To motivate the regression results, it is instructive to examine some simple plots of the tax revenue share against key factors hypothesized to determine the tax share for the full sample of sub-Saharan African countries, using 1993 data (see Figures 1–5). Agricultural share appears to have a strong inverse relationship to tax share while mining share's relationship is somewhat weaker (many countries have no mining share, reducing the sample size). The import share appears to have a strong direct relationship with tax share while the shares of exports and manufacturing also appear to be directly related to the tax share but the relationship is somewhat weaker. When plotting only the SPA countries, the relationships are similar, though not as strong (see Figures 6–10).

The estimations use least squares with several different econometric specifications. The fixed effects specification presumes that there are some country-specific characteristics not captured by the other explanatory variables that are uncorrelated with the error term (the fixed effect is represented by a zero-one dummy variable for all observations for a particular country). The random effects specification presumes that the country-specific characteristics are random for a given country. The random effect can be broken down into two components, a country-specific component that is correlated across observations on a country but uncorrelated with the explanatory variables and a random component that is uncorrelated with the country-specific component and the explanatory variables.[13] (All estimation results and test statistics are computed using LIMDEP, an econometric software package.)

C. Results with agriculture, mining, and manufacturing shares

Tables 4 and 5 present the results for the analysis using the sample of 30 countries, resulting in a panel data set of 170 observations over the six-year period of the sample from 1990–95. The first specification does not include any Fund dummy variables. The results for the fixed effects and random effects specifications are presented in columns 2 and 3 of Table 4. The Hausman test-statistic is calculated to compare the fit of the fixed effects and random effects variations.

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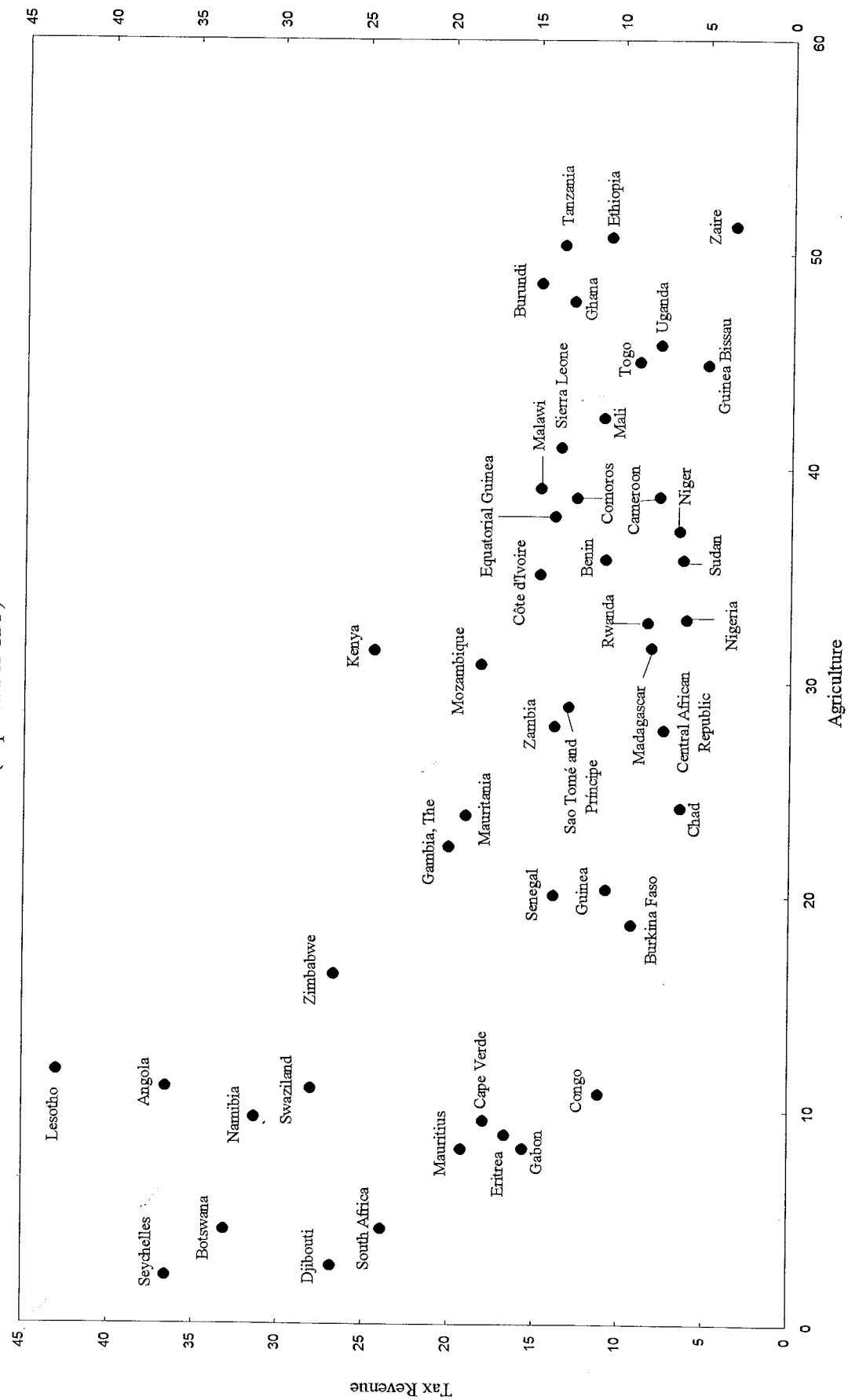
[13]A two-way fixed effects specification was also undertaken, with the time dummy variables serving as time fixed effects, but since these variables were not significant, this specification was dropped. A two-way random effects specification was not possible because of the short length of the time series.

Figure 1. Sub-Saharan African Countries: Agriculture and Tax Revenue, 1993 1/
(In percent of GDP)

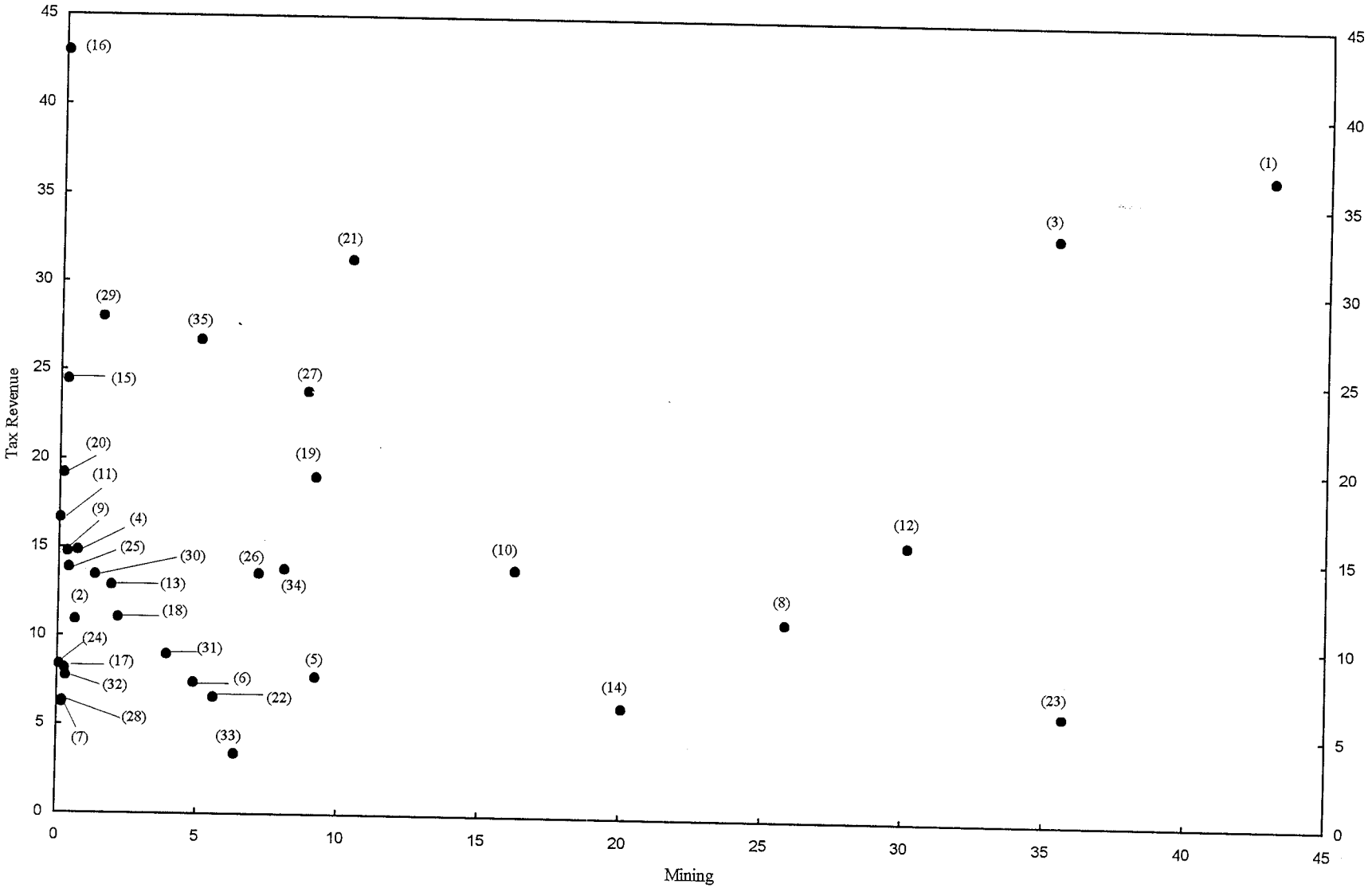


Sources: Data provided by the country authorities; and the World Bank database.

1/ Excluding Liberia and Somalia.

Figure 2. Sub-Saharan African Countries: Mining and Tax Revenue, 1993 1/

(In percent of GDP)



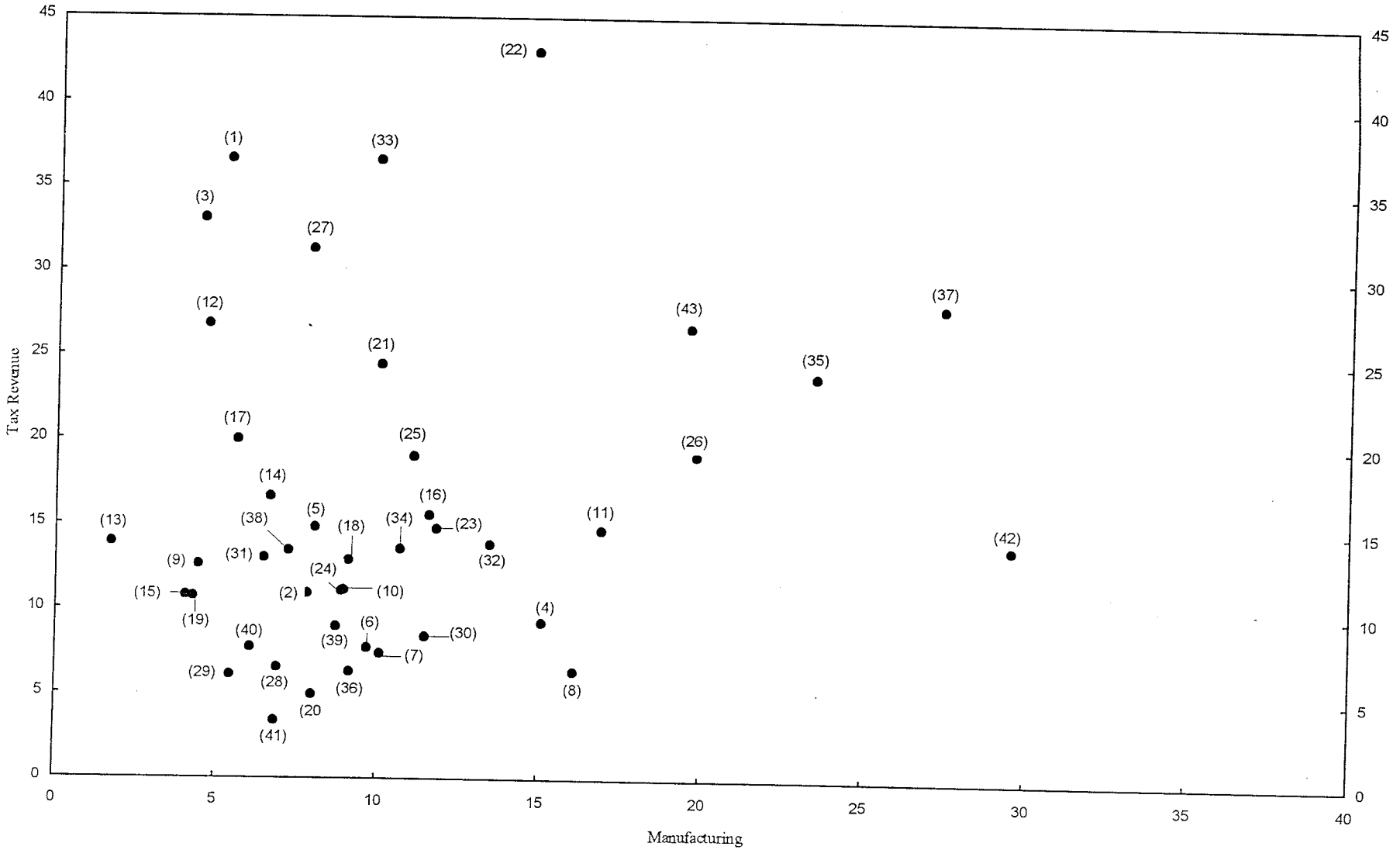
Sources: Data provided by the country authorities; and the World Bank database.

1/ Excluding Burkina Faso, Cape Verde, the Comoros, Djibouti, The Gambia, Guinea-Bissau, Liberia, Malawi, Mozambique, Sao Tomé and Príncipe, Seychelles, and Somalia.

(1) Angola	(2) Benin	(3) Botswana	(4) Burundi	(5) Cameroon	(6) Central African Republic		(7) Chad	(8) Congo
(9) Côte d'Ivoire	(10) Equatorial Guinea	(11) Eritrea	(12) Gabon	(13) Ghana	(14) Guinea	(15) Kenya	(16) Lesotho	(17) Madagascar
(18) Mali	(19) Mauritania	(20) Mauritius	(21) Namibia	(22) Niger	(23) Nigeria	(24) Rwanda	(25) Senegal	(26) Sierra Leone
(27) South Africa	(28) Sudan	(29) Swaziland	(30) Tanzania	(31) Togo	(32) Uganda	(33) Zaïre	(34) Zambia	(35) Zimbabwe

Figure 3. Sub-Saharan African Countries: Manufacturing and Tax Revenue, 1993 1/

(In percent of GDP)



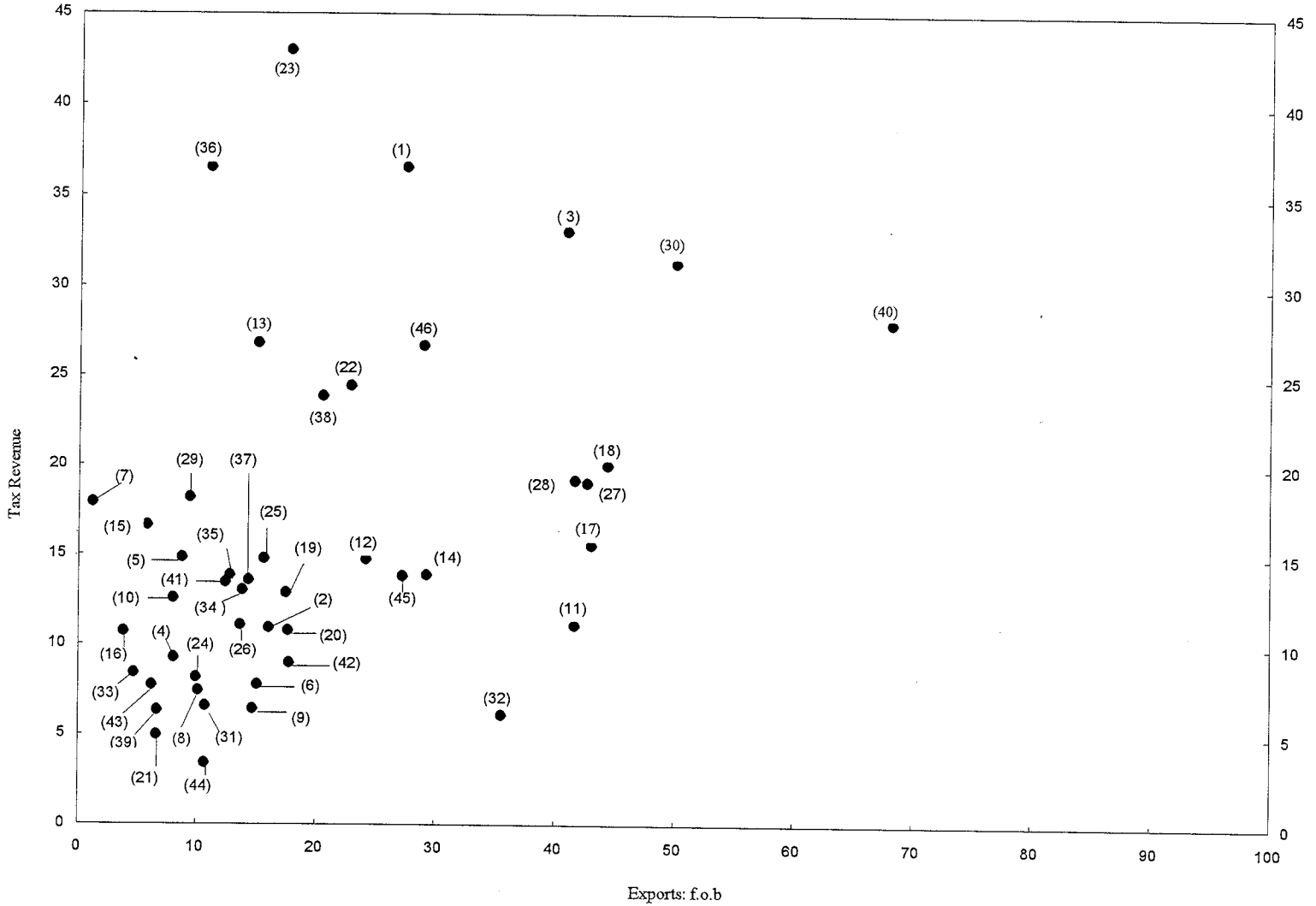
Sources: Data provided by the country authorities; and the World Bank database.

1/ Excluding Cape Verde, Liberia, Madagascar, Mozambique, and Somalia.

(1) Angola	(2) Benin	(3) Botswana	(4) Burkina Faso	(5) Burundi	(6) Cameroon	(7) Central African Republic	(8) Chad	(9) Comoros
(10) Congo	(11) Côte d'Ivoire	(12) Djibouti	(13) Equatorial Guinea	(14) Eritrea	(15) Ethiopia	(16) Gabon	(17) Gambia, The	(18) Ghana
(19) Guinea	(20) Guinea-Bissau	(21) Kenya	(22) Lesotho	(23) Malawi	(24) Mali	(25) Mauritania	(26) Mauritius	(27) Namibia
(28) Niger	(29) Nigeria	(30) Rwanda	(31) São Tomé and Príncipe	(32) Senegal	(33) Seychelles	(34) Sierra Leone	(35) South Africa	(36) Sudan
(37) Swaziland	(38) Tanzania	(39) Togo	(40) Uganda	(41) Zaïre	(42) Zambia	(43) Zimbabwe		

Figure 4. Sub-Saharan African Countries: Exports and Tax Revenue, 1993 1/ 2/

(In percent of GDP)



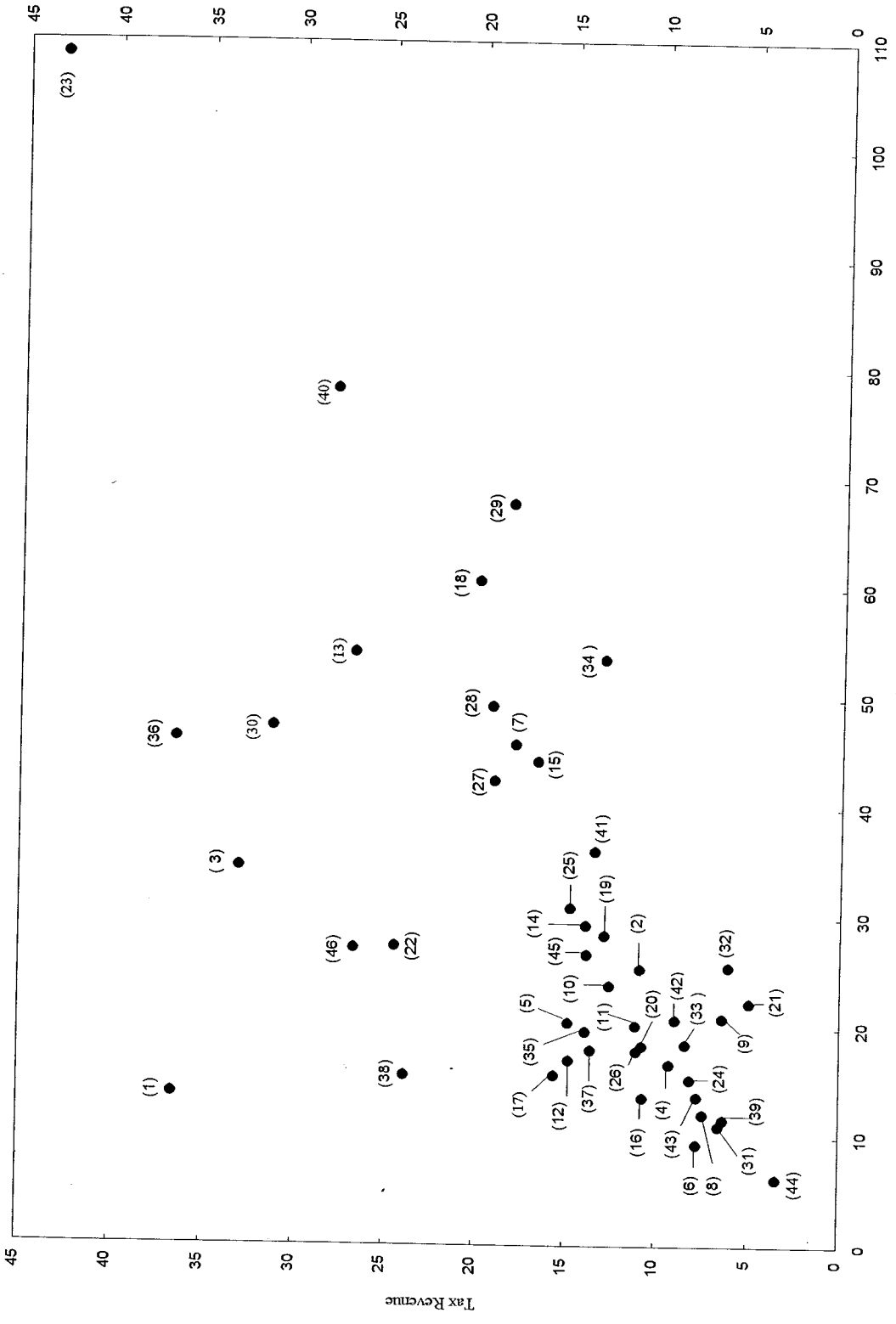
Sources: IMF, International Financial Statistics; and the country authorities.

1/ Excluding Liberia and Somalia.

2/ These calculations are derived by taking IFS data on exports (f.o.b) converted into the domestic currency and divided by IFS data on GDP.

(1) Angola	(2) Benin	(3) Botswana	(4) Burkina Faso	(5) Burundi	(6) Cameroon	(7) Cape Verde	(8) Central African Republic
(9) Chad	(10) Comoros	(11) Congo	(12) Côte d'Ivoire	(13) Djibouti	(14) Equatorial Guinea	(15) Eritrea	(16) Ethiopia
(17) Gabon	(18) Gambia, The	(19) Ghana	(20) Guinea	(21) Guinea-Bissau	(22) Kenya	(23) Lesotho	(24) Madagascar
(25) Malawi	(26) Mali	(27) Mauritania	(28) Mauritius	(29) Mozambique	(30) Namibia	(31) Niger	(32) Nigeria
(33) Rwanda	(34) São Tomé and Príncipe	(35) Senegal	(36) Seychelles	(37) Sierra Leone	(38) South Africa	(39) Sudan	(40) Swaziland
(41) Tanzania	(42) Togo	(43) Uganda	(44) Zaïre	(45) Zambia	(46) Zimbabwe		

Figure 5. Sub-Saharan African Countries: Imports and Tax Revenue, 1993 1/ 2/
(In percent of GDP)

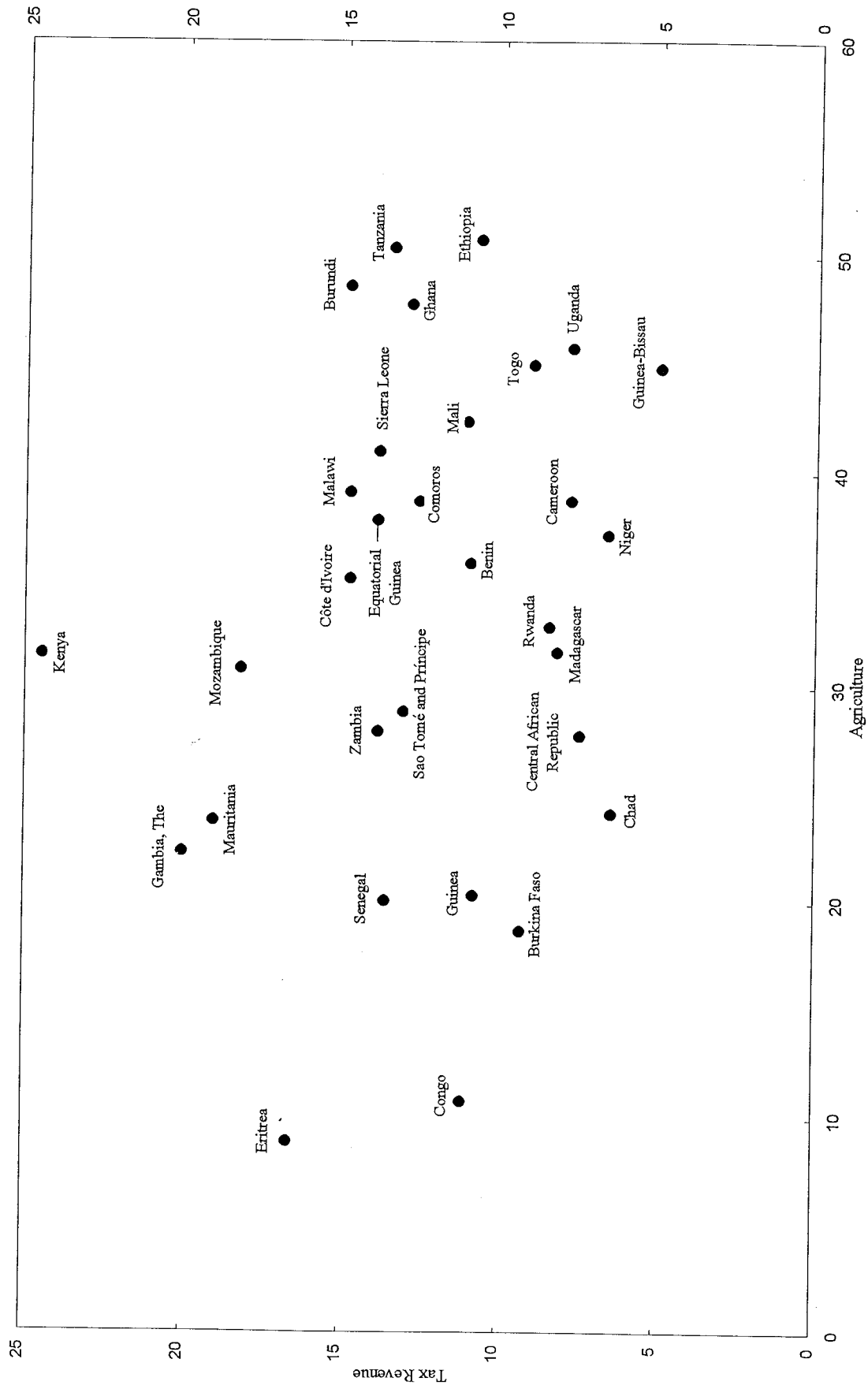


Sources: IMF, International Financial Statistics; and the country authorities.

1/ Excluding Liberia and Somalia.
2/ These calculations are derived by taking IFS data on imports (f.o.b) converted into the domestic currency and divided by IFS data on GDP.

(1) Angola (2) Benin (3) Botswana (4) Burkina Faso (5) Burundi (6) Cameroon (7) Cape Verde (8) Central African Republic
(9) Chad (10) Comoros (11) Congo (12) Côte d'Ivoire (13) Djibouti (14) Equatorial Guinea (15) Eritrea (16) Ethiopia
(17) Gabon (18) Gambia, The (19) Ghana (20) Guinea (21) Guinea-Bissau (22) Kenya (23) Lesotho (24) Madagascar
(25) Malawi (26) Mali (27) Mauritania (28) Mauritius (29) Mozambique (30) Namibia (31) Niger (32) Nigeria
(33) Rwanda (34) São Tomé and Príncipe (35) Senegal (36) Seychelles (37) Sierra Leone (38) South Africa (39) Sudan (40) Swaziland
(41) Tanzania (42) Togo (43) Uganda (44) Zaïre (45) Zambia (46) Zimbabwe

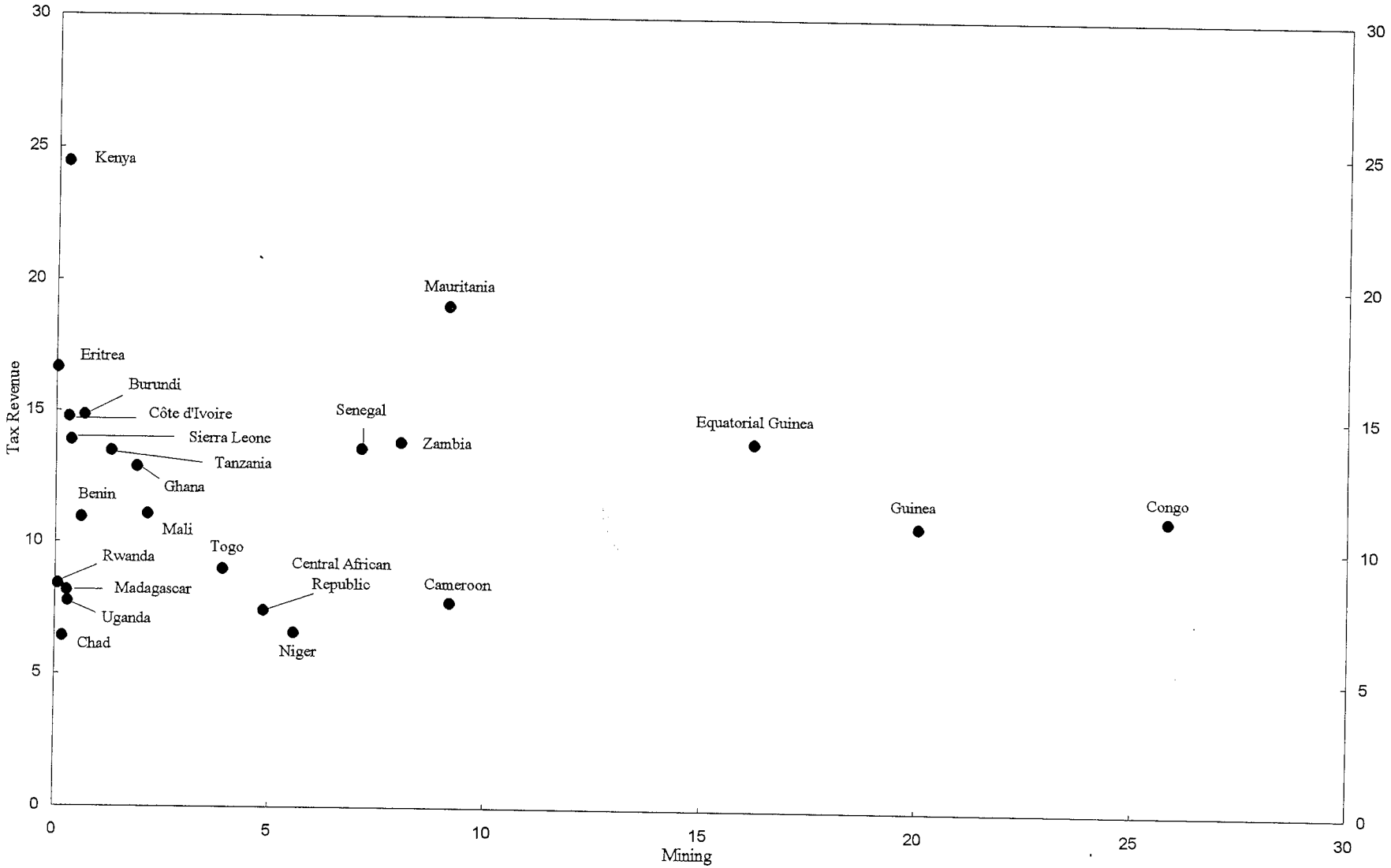
Figure 6. SPA Countries: Agriculture and Tax Revenue, 1993
(In percent of GDP)



Sources: Data provided by the country authorities; and the World Bank database.

Figure 7. SPA Countries: Mining and Tax Revenue, 1993 1/

(In percent of GDP)

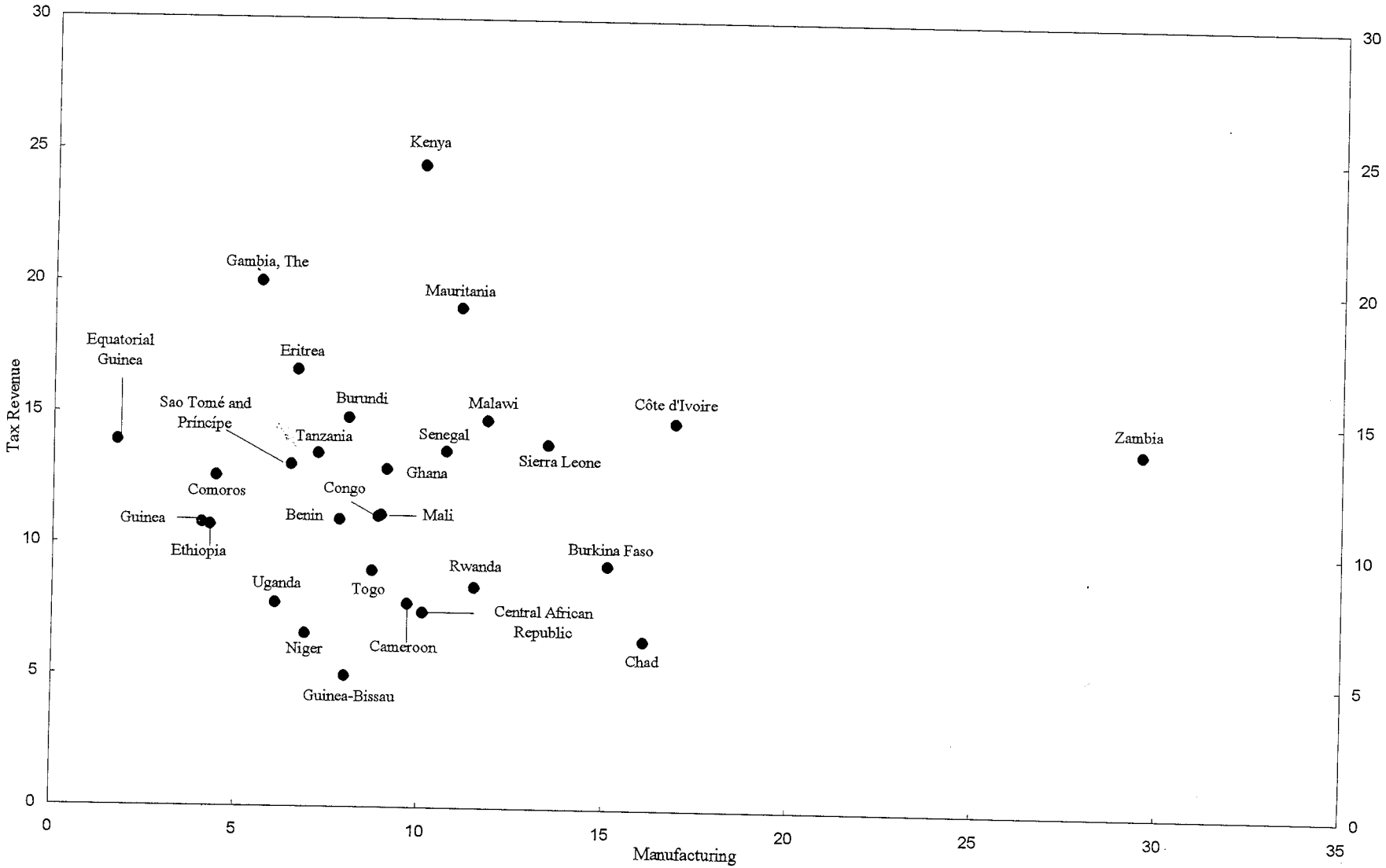


Sources: Data provided by the country authorities; and the World Bank database.

1/ Excluding Burkina Faso, the Comoros, Ethiopia, The Gambia, Guinea-Bissau, Malawi, Mozambique, and SaoTomé and Príncipe.

Figure 8. SPA Countries: Manufacturing and Tax Revenue, 1993 1/

(In percent of GDP)

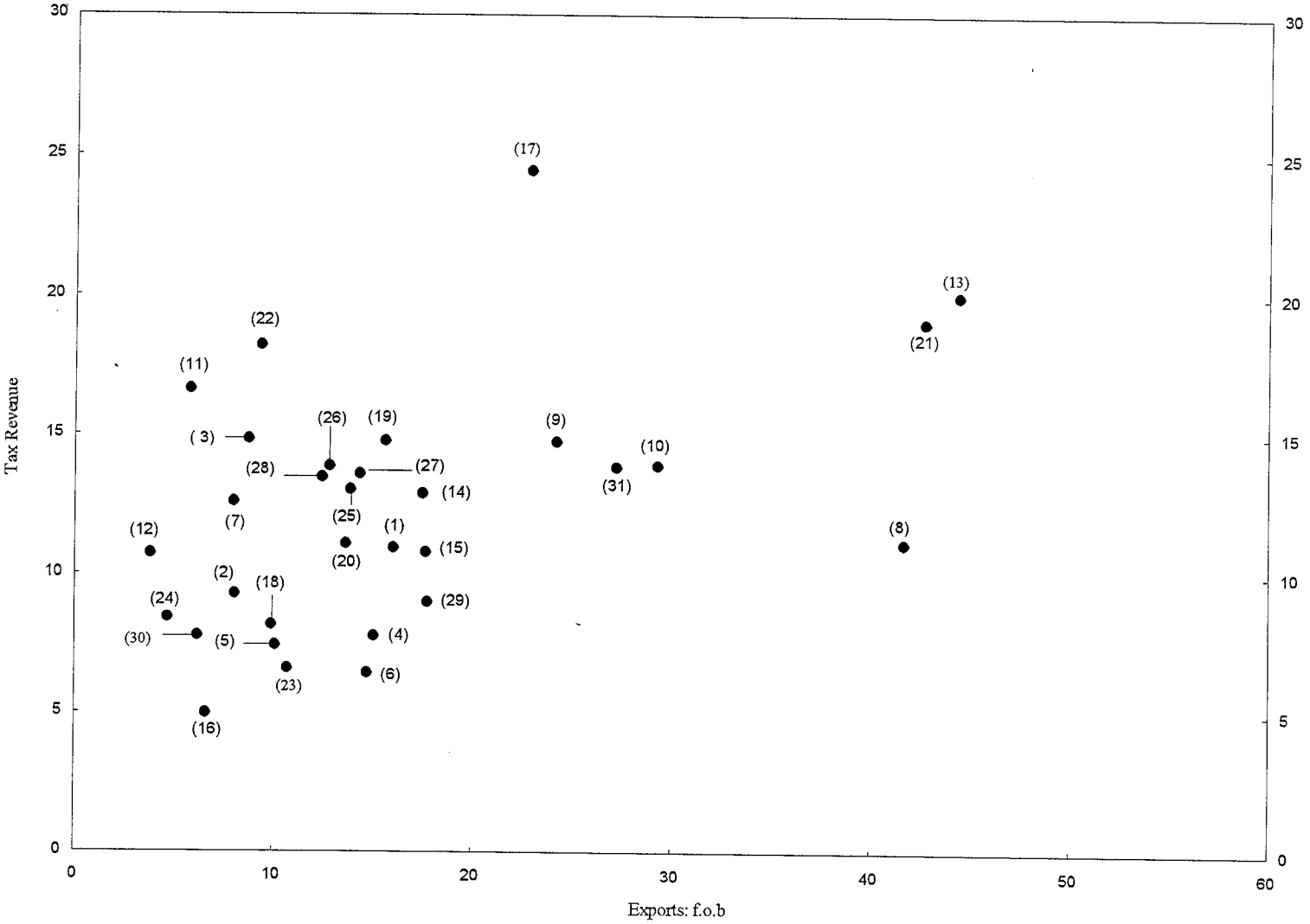


Sources: Data provided by the country authorities; and the World Bank database.

1/ Excluding Madagascar and Mozambique.

Figure 9. SPA Countries: Exports and Tax Revenue, 1993 1/ 2/

(In percent of GDP)



Sources: IMF, International Financial Statistics; and the country authorities.

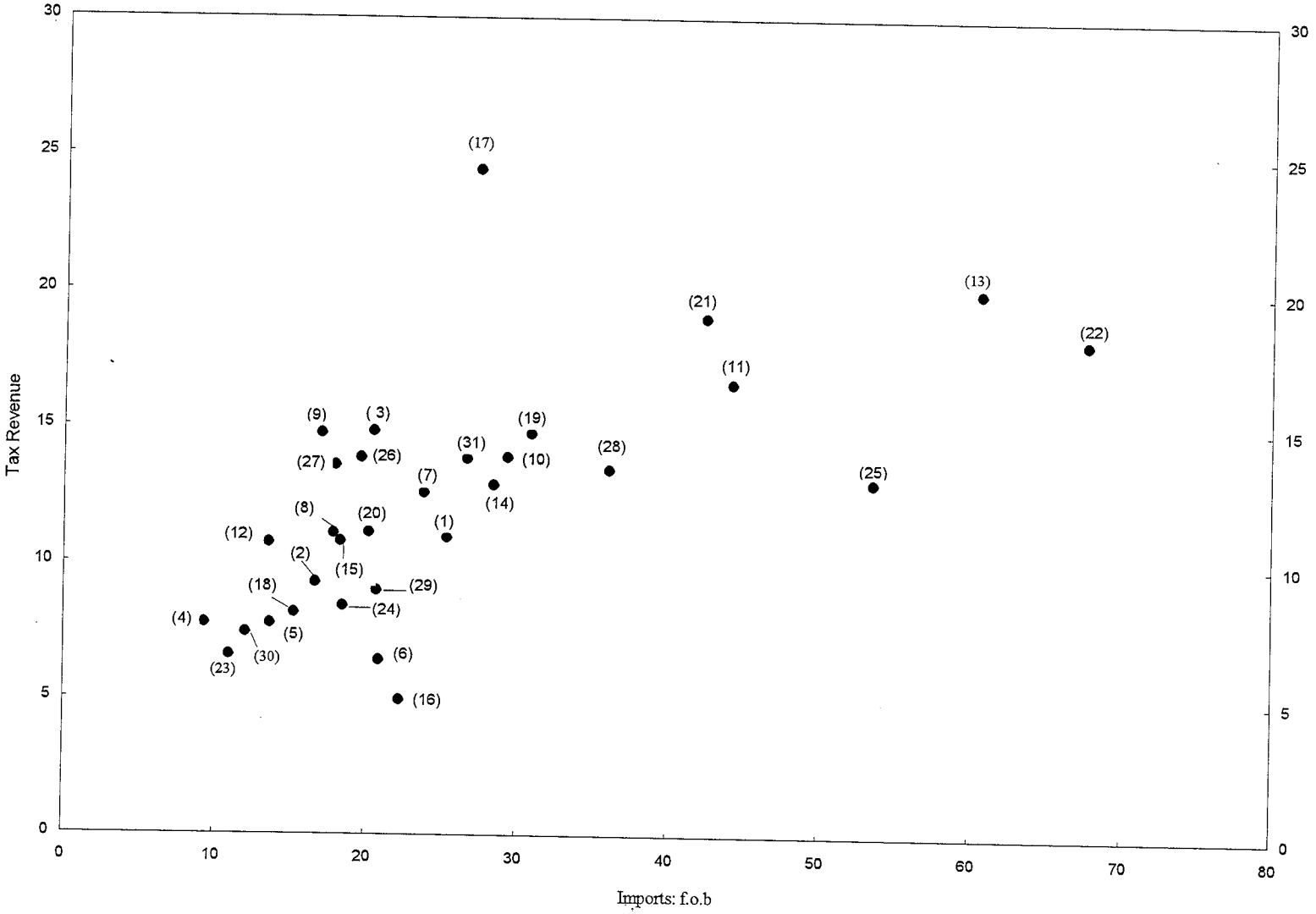
1/ Excluding Liberia and Somalia.

2/ These calculations are derived by taking IFS data on exports (f.o.b) converted into the domestic currency and divided by IFS data on GDP.

(1) Benin	(2) Burkina Faso	(3) Burundi	(4) Cameroon	(5) Central African Republic	(6) Chad	(7) Comoros
(8) Congo	(9) Côte d'Ivoire	(10) Equatorial Guinea	(11) Eritrea	(12) Ethiopia	(13) Gambia, The	(14) Ghana
(15) Guinea	(16) Guinea-Bissau	(17) Kenya	(18) Madagascar	(19) Malawi	(20) Mali	(21) Mauritania
(22) Mozambique	(23) Niger	(24) Rwanda	(25) São Tomé and Príncipe	(26) Senegal	(27) Sierra Leone	(28) Tanzania
(29) Togo	(30) Uganda	(31) Zambia				

Figure 10. SPA Countries: Imports and Tax Revenue, 1993 1/ 2/

(In percent of GDP)



Sources: IMF, International Financial Statistics; and country authorities.

1/ Excluding Liberia and Somalia.

2/ These calculations are derived by taking IFS data on imports (f.o.b) converted into the domestic currency and divided by IFS data on GDP.

(1) Benin
(2) Burkina Faso
(3) Burundi
(4) Cameroon
(5) Central African Republic
(6) Chad
(7) Comoros
(8) Congo
(9) Côte d'Ivoire
(10) Equatorial Guinea
(11) Eritrea
(12) Ethiopia
(13) Gambia, The
(14) Ghana
(15) Guinea
(16) Guinea-Bissau
(17) Kenya
(18) Madagascar
(19) Malawi
(20) Mali
(21) Mauritania
(22) Mozambique
(23) Niger
(24) Rwanda
(25) São Tomé and Príncipe
(26) Senegal
(27) Sierra Leone
(28) Tanzania
(29) Togo
(30) Uganda
(31) Zambia

Table 4. Sub-Saharan Africa: Determinants of Tax Share with Panel Data

Variables	OLS Including Fixed Effects	OLS Including Random Effects	OLS Including Fixed Effects with Fund Dummies	OLS Including Random Effects with Fund Dummies
Constant		13.882 * ** (2.999)		14.080 * ** (3.108)
Agricultural share	-0.113 * (0.061)	-0.168 * ** (0.052)	-0.117 * (0.062)	-0.173 * ** (0.053)
Mining share	-0.259 * ** (0.075)	-0.252 * ** (0.066)	-0.260 * ** (0.075)	-0.253 * ** (0.066)
Manufacturing share	0.101 (0.152)	0.019 (0.117)	0.053 (0.159)	-0.007 (0.120)
Export share	0.314 * ** (0.049)	0.250 * ** (0.044)	0.339 * ** (0.050)	0.269 * ** (0.045)
Import share	-0.028 (0.030)	0.032 (0.026)	-0.038 (0.031)	0.025 (0.027)
Per capita income (in thousands of 1990 dollars)	2.913 * ** (0.808)	1.984 * ** (0.653)	2.855 * ** (0.851)	1.821 * ** (0.680)
1990 dummy*target			0.012 (0.040)	0.011 (0.040)
1991 dummy*target			0.120 * ** (0.046)	0.103 * ** (0.046)
1992 dummy*target			0.042 (0.037)	0.028 (0.037)
1993 dummy*target			0.019 (0.041)	0.021 (0.040)
1994 dummy*target			-0.036 (0.044)	-0.044 (0.043)
1995 dummy*target			-0.018 (0.053)	-0.024 (0.052)
Adjusted R-squared	0.961	0.465	0.962	0.458
Estimated autocorrelation of the random error term	0.190	0.002	0.197	0.002
Hausman test		26.765		35.755
Number of observations	170	170	170	170

Source: Authors' estimations.
* Indicates significant at 10 percent level.
** Indicates significant at 5 percent level.
Standard errors are in parentheses.

Table 5: Sub-Saharan Africa: Index of Tax Effort with Random Effects

	1990	1991	1992	1993	1994	1995
Benin	0.602	0.611	0.740	0.805	0.787	0.848
Botswana	1.786	1.639	1.749	1.672	1.391	1.307
Burundi	1.742	1.513	1.729	1.736	1.850	1.960
Cameroon	0.665	0.693	0.671	0.723	0.848	
Central African Republic	0.865	0.713	0.746	0.630	0.518	0.713
Chad	0.476	0.433	0.459	0.440	0.431	0.493
Congo	0.815	0.785	0.734	0.581	0.410	
Equatorial Guinea	0.857	0.746	0.877	0.888		
Gabon	0.508	0.660	0.653	0.563		
Ghana	1.028	1.072	0.952	1.162	1.292	1.222
Guinea	1.143	0.995	1.132	0.939	0.939	
Kenya	1.405	1.329	1.372	1.461	1.667	1.595
Lesotho	1.935	1.932	1.992	2.165	2.078	1.954
Mali	0.925	1.114	1.015	1.033	0.877	0.914
Mauritania	0.896	0.870	0.849	0.904	0.959	0.804
Mauritius	0.700	0.660	0.645	0.658	0.599	0.552
Namibia	1.104	1.239	1.183	1.169	1.201	1.256
Niger	0.724	0.675	0.672	0.666	0.551	0.677
Nigeria	0.744	0.731	0.774	0.630	0.694	0.770
Rwanda	1.112	0.928	0.856	0.829	0.368	0.688
Senegal	0.931	0.929	0.954	0.886		
Sierra Leone	0.887	1.055	1.039	1.289	1.476	
South Africa	1.113	1.103	1.093	1.145	1.198	1.179
Sudan	0.473	0.549	0.727	0.685	0.694	0.713
Swaziland	0.895	0.884	0.819	0.812	0.831	0.959
Tanzania	1.457	1.454	1.243	1.443	1.344	1.246
Togo	1.221	1.018	0.930	0.811	0.853	0.916
Uganda	0.941	0.747	0.868	0.966	1.059	1.005
Zambia	1.044	0.978	0.905	0.908	1.103	0.898
Zimbabwe	1.604	1.561	1.637	1.442	1.455	1.740

Source: Authors' estimations.

It rejects the fixed effects specification in favor of the random effects specification[14] (see the authors for details of the ordinary least squares and fixed effects regressions, including coefficient estimates on the fixed effects).[15]

Both the fixed effects and random effects specifications indicate that the agricultural share and mining share are negative and significantly related to the tax ratio while the export share and per capita income are positive and significant. These results are consistent with intuition with the exception of the mining share, which we might have expected to have a positive relation with the tax ratio. In the fixed effects specification, the fixed effects account for much of the variation in the tax share. Alone, they generate an R-squared of 0.95 while the addition of the other explanatory variables only raises the R-squared to 0.97 on an unadjusted basis though the explanatory variables alone have an R-squared of 0.67. Similarly, with the random effects specification, the variance of the country-specific component is much larger than the variance of the purely random component. These results suggest that factors specific to these countries (e.g., the political system; attitudes toward government; the quality of tax, customs, and other institutions of government; commodity price shocks, etc.) are important determinants of variations in the tax share in GDP.

An alternative specification included the same variables and the zero-one Fund dummy variable, but in this regression, the Fund dummy variable was not significant nor did its inclusion change the overall results much (a similar specification with the Fund dummy variable lagged one year, to take into account possible lags in the effect of Fund programs, also did not find a significant relationship).

A final specification included the Fund variable, where this variable was constructed as the Fund's target for tax share for each country with a Fund program (otherwise the target was zero) interacted with a dummy variable for each year in the sample. These results are presented for the fixed effect and random effect specifications in columns 4 and 5 of Table 4. The results for the coefficients on the value-added shares, foreign trade shares, and per capita income are similar to those in the estimation without these Fund variables. Only the target for 1991 is significant in this specification, with the target positively correlated with the tax share in that year. This target variable could be endogenous, since fiscal targets are generally set by the Fund with consideration of tax shares and other fiscal variables in mind. But since the results for the overall regression and the other variables in this regression and the results in the specification without any Fund variables are similar, this is not an important concern. These results are suggestive of a positive link between Fund programs and tax share, though the weakness of this link may reflect the difficulties of aggregating the multiple objectives of Fund

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[14]The Hausman test-statistic has a value of 26.8. The probability value is 0.895, where low probabilities indicate rejection of the random effects model.

[15]Heteroskedasticity is not likely to be a problem since all variables are scaled by GDP with the exception of per capita income. Autocorrelation is potentially a more important problem, but the estimated autocorrelation coefficient of the random error term was close to zero.

programs into a single indicator variable, such as the target tax share. An analysis that more clearly differentiates between Fund programs that place high emphasis on increasing tax share and those that do not might be more revealing.

One potential problem with the analysis is the somewhat arbitrary distinction drawn between tax revenues and nontax revenues. For instance, Nigeria's principal source of revenues is from oil extraction, but it does not classify any of this revenue as tax revenue in the budget. It was hypothesized that the strong negative correlation between mining and the tax ratio might stem from the inclusion of Nigeria, because of this measurement issue. The same analysis, however, dropping the observations on Nigeria, still found a significant negative correlation. An alternative specification that substituted total revenue for tax revenue for the dependent variable found that mining was no longer significant. For comparability to previous studies, however, this analysis relied on the tax revenue measure for the dependent variable.

For many of these countries, the share of mining exports in total exports may be relatively large, so that the share of mining in GDP and the export share would be highly correlated (the simple correlation coefficient between these two variables is 0.47 for the sample). The results were not entirely robust to the exclusion of mining or export share from the analysis. The pattern of significance of the sectoral shares and external trade and income variables seemed to depend on which of these two variables was included, and on the fixed or random effects specification.[16] [17] Nevertheless, since there was no obvious problem with multicollinearity in the estimation, there is no reason to drop either one of these two variables from the regression specification.

The specifications with per capita income measured in purchasing power corrected terms did not indicate a significant relationship between this variable and tax share in contrast to the specification presented in Table 4 where per capita income measured in dollars is significantly related to the tax share. For this analysis, the income measured in dollars might be more appropriate as a variable than income measured in purchasing power corrected terms because

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[16]With export share excluded, the fixed effects specification found no significant sectoral shares and only a significant positive coefficient on per capita income. The random effects specification found a negative and significant agricultural share, and a positive and significant import share and per capita income. In neither case was the mining share significant. With no mining share, the fixed effects specification found that the agricultural share was not significant but that the manufacturing share was positive and significant at the 10 percent level. Export share and per capita income were strongly significant and positive. The random effects specification found that the agricultural share was negative and significant and the manufacturing share was positive and significant at the 10 percent level. Export share, per capita income, and the import share were positive and significant, though import share only at a 10 percent level.

[17]The index values, constructed from the regression results, were not especially sensitive to the particular variables included.

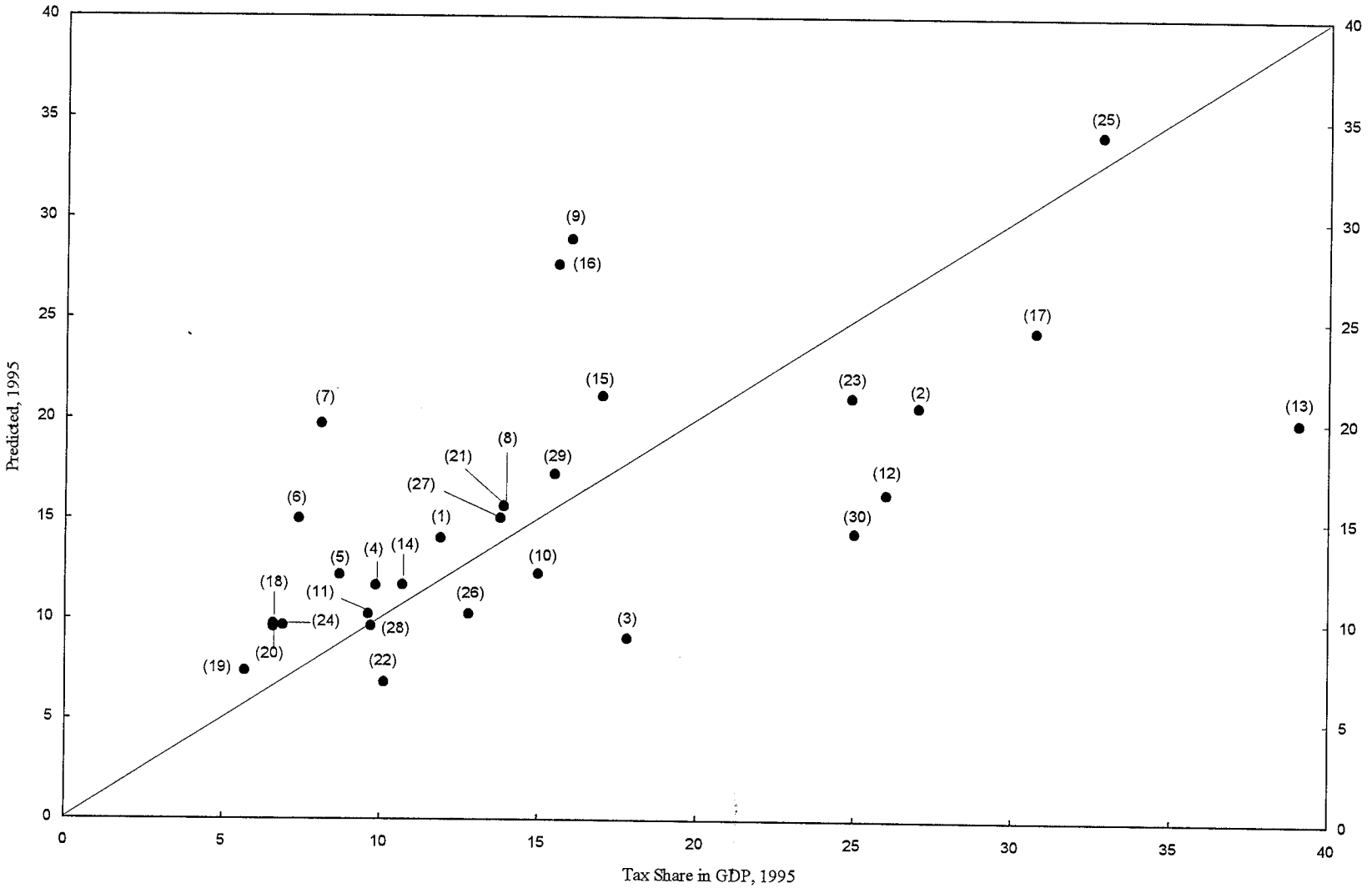
this analysis is trying to capture differences in income that generate differences in ability to tax rather than differences in standards of living.

Two final specifications were undertaken including a dummy variable for the CFA franc zone countries interacted with 1994 and 1995 and for only 1995 on the assumption it might take time for the devaluation to influence revenues. In both regressions this dummy variable was not significant, suggesting that the devaluation of the CFA franc in 1994 did not have a significant effect on tax shares for these countries in the short term though tax shares have increased recently for this group of countries (Table 1).

Tax effort indices are calculated for the random effects specification that includes Fund dummy variables interacted with targets (column 5 of Table 4). It should be noted that the condition that the tax index for an observation equal 1 is the same as the condition that the residual for that observation equal 0 (by rearranging the expression). Therefore, a tax index above 1 corresponds to a positive residual and an index below 1 corresponds to a negative residual. So in essence the index measures the extent to which the observation is an outlier, either above or below the regression line. These indices are presented in Table 5. Alternatively, Figure 11 plots tax share against predicted tax share for 1995 (or the latest year for which data are available). High index countries correspond to those below the 45 degree line while low index countries correspond to those above. As with the previous studies, countries that have a relatively high tax share in GDP also tend to have a relatively high tax effort index (see Figure 12). The sample correlation between the tax share and the index is 0.70. There are, however, a few notable exceptions. Some countries, such as Burundi, Ghana, Sierra Leone, and Tanzania have a relatively high tax index with a relatively low tax share.

In 1995, the tax effort index is above 1 in most of the countries of Southern Africa, including Botswana, Lesotho, Namibia, South Africa, and Zimbabwe. The exception is Swaziland, whose index is a little below 1. To some extent the high value for the indices in Southern Africa may reflect the influence of the South African Customs Union (which includes the above countries except Zimbabwe) under which South Africa sets a common external tariff and the other countries receive compensatory transfers for the effects of the South African tariff regime. In some of the countries, the compensatory transfer represents a significant share of revenue. It may also reflect spillovers from tax administration practices in use in South Africa to these other countries. Other countries with an index above 1 in 1995 are Burundi, Ghana, Kenya, Tanzania, and Uganda, and, in 1994, Sierra Leone (the latest year for which data are available). Several of the tropical or Saharan African countries have rather low indices of tax effort. The tax effort index is below 0.8 in the Central African Republic, Chad, Mauritius, Niger, Nigeria, Rwanda, and Sudan, and, in 1994, the Congo and, in 1993, Gabon (the latest years for which complete data are available). Figure 13 plots the number of years of Fund program 1990–95 against the percentage change in the index over that period (in some cases, the terminal year is the latest year for which data are available). It suggests a rather weak overall relationship, as was found in the regression analysis.

Figure 11. Sub-Saharan African Countries: Relationship of Tax Share to Predicted Tax Share, 1995 1/ 2/

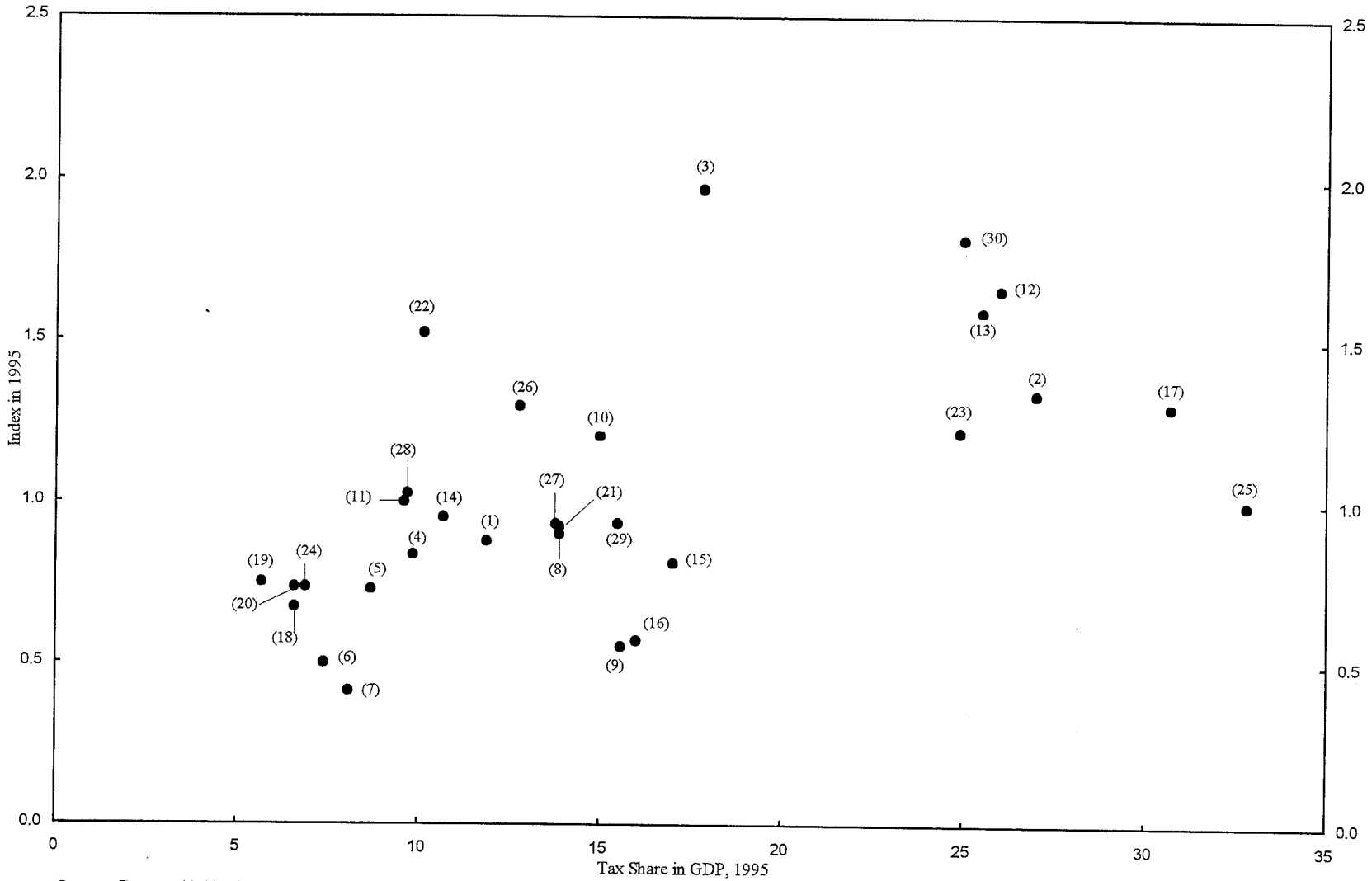


Sources: Data provided by the country authorities; and Fund staff calculations.

1/ Data refer to 1993 for Equatorial Guinea, Gabon, and Senegal.
2/ Data refer to 1994 for Cameroon, Congo, Guinea, and Sierra Leone.

(1) Benin	(2) Botswana	(3) Burundi	(4) Cameroon	(5) Central African Republic		(6) Chad	(7) Congo	(8) Equatorial Guinea
(9) Gabon	(10) Ghana	(11) Guinea	(12) Kenya	(13) Lesotho	(14) Mali	(15) Mauritania	(16) Mauritius	(17) Namibia
(18) Niger	(19) Nigeria	(20) Rwanda	(21) Senegal	(22) Sierra Leone	(23) South Africa		(24) Sudan	(25) Swaziland
(26) Tanzania	(27) Togo	(28) Uganda	(29) Zambia	(30) Zimbabwe				

Figure 12 . Selected Sub-Saharan African Countries: Relationship of Tax Share to Tax Index, 1995 1/ 2/

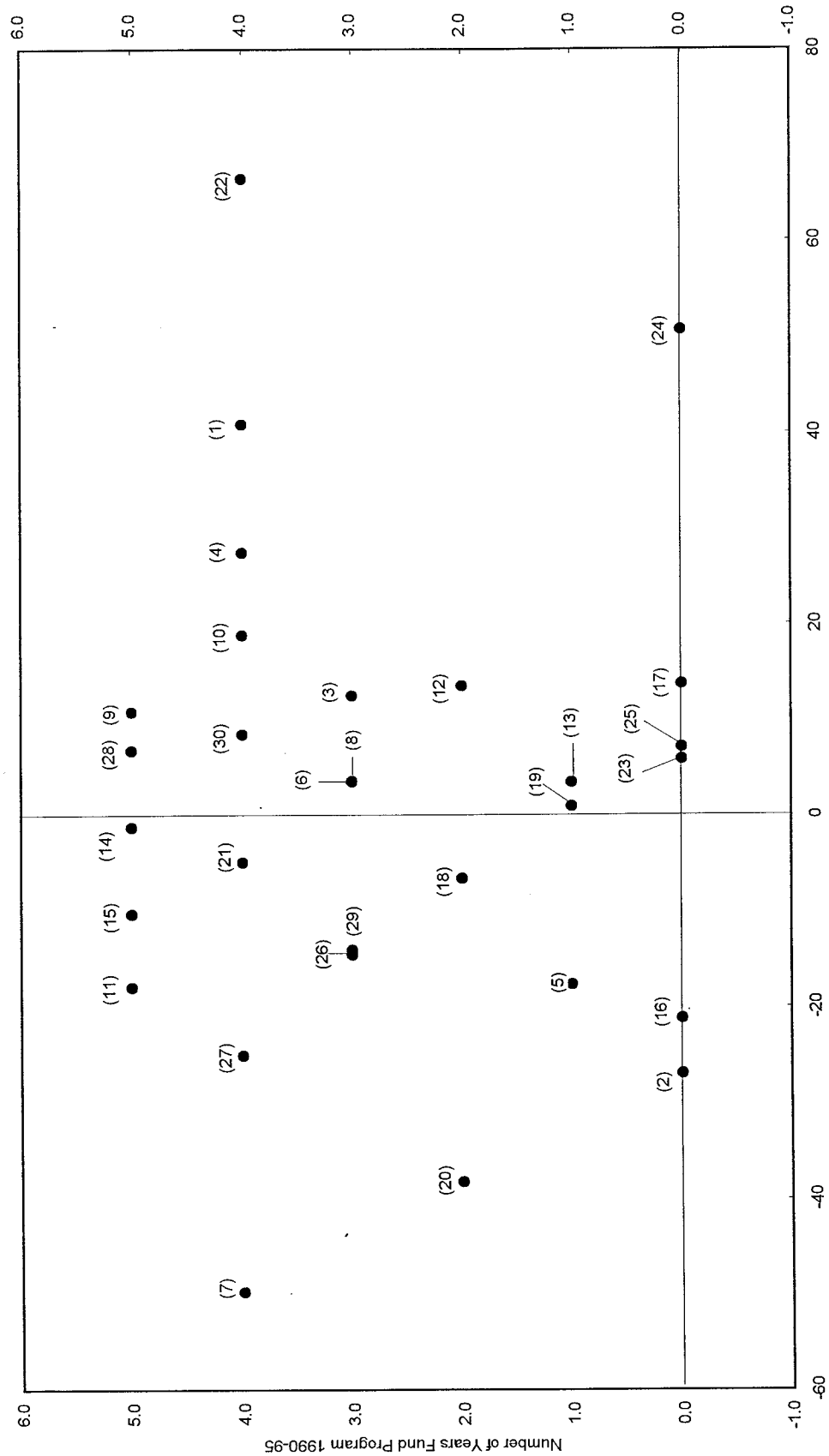


Sources: Data provided by the country authorities; and Fund staff calculations.

1/ Data refer to 1993 for Equatorial Guinea, Gabon, and Senegal.
2/ Data refer to 1994 for Cameroon, Congo, Guinea, and Sierra Leone.

(1) Benin	(2) Botswana	(3) Burundi	(4) Cameroon	(5) Central African Republic		(6) Chad	(7) Congo	(8) Equatorial Guinea
(9) Gabon	(10) Ghana	(11) Guinea	(12) Kenya	(13) Lesotho	(14) Mali	(15) Mauritania	(16) Mauritius	(17) Namibia
(18) Niger	(19) Nigeria	(20) Rwanda	(21) Senegal	(22) Sierra Leone		(23) South Africa	(24) Sudan	(25) Swaziland
(26) Tanzania	(27) Togo	(28) Uganda	(29) Zambia	(30) Zimbabwe				

Figure 13. Sub-Saharan African Countries: Relationship of Change in Indices to Fund Program, 1990-95 1/ 2/



Sources: Data provided by the country authorities; and Fund staff calculations.

1/ Data refer to 1990-93 for Equatorial Guinea, Gabon, and Senegal.
2/ Data refer to 1990-94 for Cameroon, Congo, Guinea, and Sierra Leone.

(1) Benin	(2) Botswana	(3) Burundi	(4) Cameroon	(5) Central African Republic	(6) Chad	(7) Congo	(8) Equatorial Guinea
(9) Gabon	(10) Ghana	(11) Guinea	(12) Kenya	(13) Lesotho	(14) Mali	(15) Mauritania	(16) Mauritius
(17) Namibia	(18) Niger	(19) Nigeria	(20) Rwanda	(21) Senegal	(22) Sierra Leone	(23) South Africa	(24) Sudan
(25) Swaziland	(26) Tanzania	(27) Togo	(28) Uganda	(29) Zambia	(30) Zimbabwe		

The tax effort indices are relatively stable over the 1990–95 period, though many countries have either an upward or downward trend (see Figure 14). Benin, Cameroon, Sierra Leone, and Sudan all showed an increase of more than 20 percent in the value of the index in the sample period, while several other countries (many Anglophone, though not exclusively) experienced smaller, though still sizable increases. Botswana, the Congo, Mauritius, Rwanda, and Togo all showed a decline of more than 20 percent in the index in the sample period. The deterioration in Togo may reflect political problems in this period. Similarly, Rwanda experienced serious civil unrest in this period, leading to a decline of almost 40 percent in the index (though the low point was reached in 1994). The decline in Botswana reflects at least in part an intentional policy to reduce the tax share, though, even so, the index was still relatively high in the period. Other countries experienced smaller, though still sizable, declines in this period.

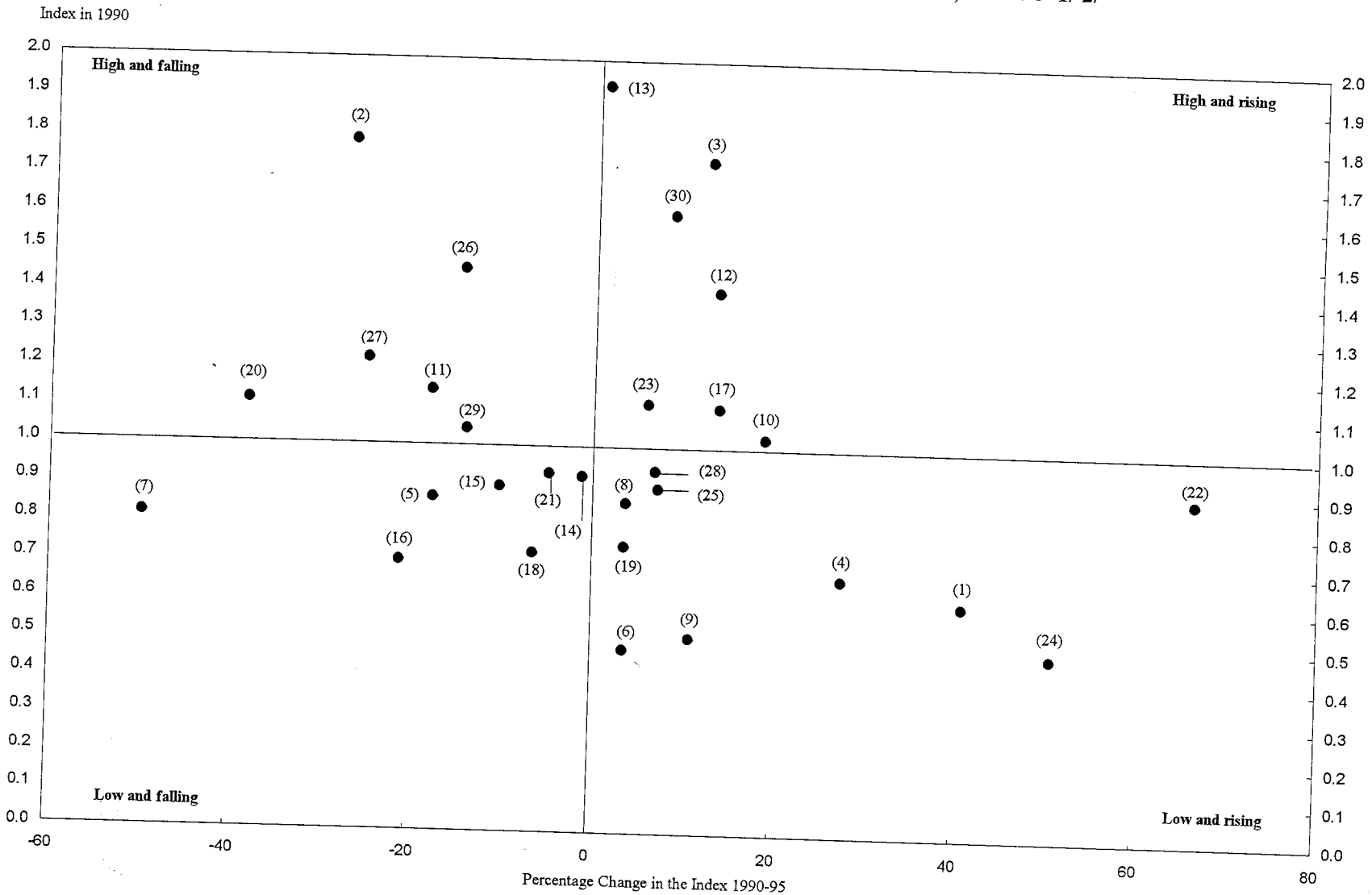
D. Results with agricultural share

The analysis with the larger sample, including 43 countries and 249 observations, yields results that are similar in their main implications (see Tables 6–7). As in the previous analysis, the specification tests reject the fixed effects specification in favor of the random effects specification. Unlike in the smaller sample, the significant variables in the regression are not identical across the different specifications. The agricultural share is always negative and significant and the export share is always positive and significant. The import share is positive and significant in the random effects specification. The zero-one Fund dummy variable is again not significant and hence it is dropped from the analysis. In the specification including Fund dummy variables (column 5 of Table 6), the results are similar, though in contrast to the smaller sample, the Fund dummy variable interacted with the target is negative and significant in 1994, suggesting that as the target increases the tax share declines, a somewhat counterintuitive result.

Tax effort indices for this specification are presented in Table 7. The results are broadly similar to those with the smaller sample, though not in all cases. The countries that tend to have a high tax share in GDP also tend to have a high predicted tax share and a high tax effort index (see Figures 15–16). Ethiopia has a relatively high tax effort despite having a relatively low tax share in GDP while Sierra Leone's tax effort is not as strong as in the previous estimation.

In 1995, the tax effort index is above 1 in the countries of Southern Africa, including Botswana, Lesotho, Namibia, South Africa, Swaziland, and Zimbabwe. Other countries with an index above 1 in 1995 are Angola, Burundi, the Comoros, Côte d'Ivoire, Djibouti, Ethiopia, Ghana, Kenya, Malawi, Seychelles, Tanzania, and Uganda, and, in 1994, in Sierra Leone (the last year for which data are available). The tropical African countries again tend to have low indices of tax effort. The tax effort index is below 0.8 in 1995 in Burkina Faso, the Central African Republic, Chad, Equatorial Guinea, Guinea-Bissau, Madagascar, Niger, Nigeria, Rwanda, São Tomé and Príncipe, and Sudan, and, in 1994, in the Congo and Guinea (the last year for which data are available). Again, there is no obvious strong link between countries with a Fund program and the tax index (see Figure 17).

Figure 14. Sub-Saharan African Countries: Change in Tax Indices, 1990-95 1/ 2/



Sources: Data provided by the country authorities; and Fund staff calculations.

1/ Data refer to 1990-93 for Equatorial Guinea, Gabon, and Senegal.
2/ Data refer to 1990-94 for Cameroon, Congo, Guinea, and Sierra Leone.

(1) Benin	(2) Botswana	(3) Burundi	(4) Cameroon	(5) Central African Republic	(6) Chad	(7) Congo	(8) Equatorial Guinea
(9) Gabon	(10) Ghana	(11) Guinea	(12) Kenya	(13) Lesotho	(14) Mali	(15) Mauritania	(16) Mauritius
(17) Namibia	(18) Niger	(19) Nigeria	(20) Rwanda	(21) Senegal	(22) Sierra Leone	(23) South Africa	(24) Sudan
(25) Swaziland	(26) Tanzania	(27) Togo	(28) Uganda	(29) Zambia	(30) Zimbabwe		

Table 6. Sub-Saharan Africa: Determinants of Tax Share with Panel Data

Variables	OLS Including Fixed Effects	OLS Including Random Effects	OLS Including Fixed Effects with Fund Dummies	OLS Including Random Effects with Fund Dummies
Constant		18.053 * ** (2.046)		18.018 * ** (2.064)
Agricultural share	-0.216 * ** (0.059)	-0.260 * ** (0.045)	-0.211 * ** (0.059)	-0.262 * ** (0.045)
Export share	0.120 * ** (0.035)	0.098 * ** (0.030)	0.143 * ** (0.036)	0.115 * ** (0.030)
Import share	0.029 (0.030)	0.083 * ** (0.025)	0.026 (0.030)	0.079 * (0.025)
Per capita income (in thousands of 1990 dollars)	0.032 (0.628)	0.394 (0.512)	-0.453 (0.667)	0.071 (0.541)
1990 dummy*target			0.036 (0.041)	0.037 (0.041)
1991 dummy*target			0.644 (0.044)	0.060 (0.044)
1992 dummy*target			0.018 (0.043)	0.012 (0.042)
1993 dummy*target			0.022 (0.043)	0.029 (0.042)
1994 dummy*target			-0.098 * ** (0.042)	-0.087 * ** (0.042)
1995 dummy*target			-0.011 (0.049)	0.002 (0.049)
Adjusted R-squared	0.935	0.579	0.937	0.575
Estimated autocorrelation of the random error term	0.272	0.002	0.249	0.001
Hausman test		11.004		16.979
Number of observations	249	249	249	249

Source: Authors' estimations.
* Indicates significant at 10 percent level.
** Indicates significant at 5 percent level.
Standard errors are in parentheses.

Table 7. Sub-Saharan Africa: Index of Tax Effort with Random Effects

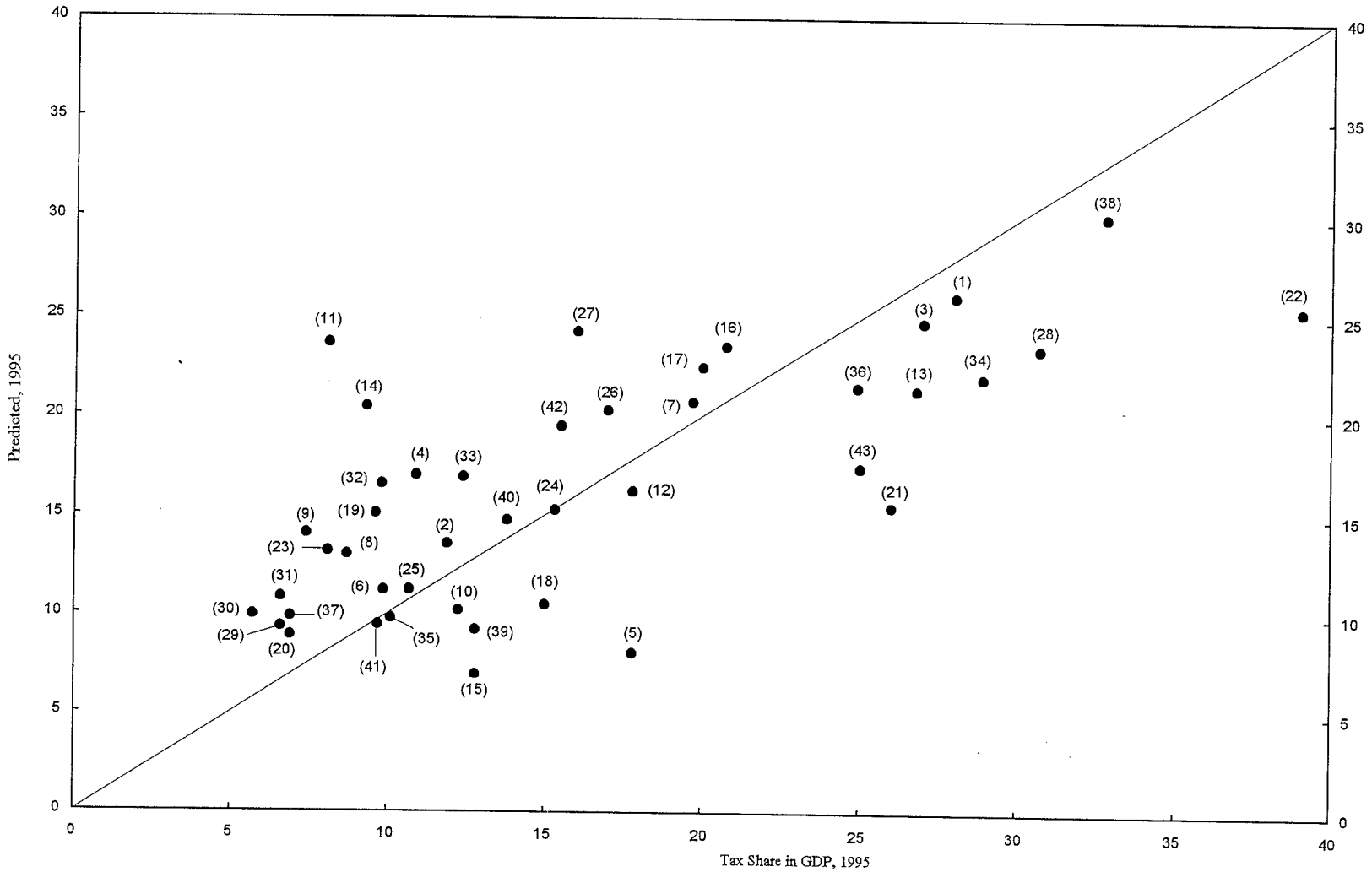
Country	1990	1991	1992	1993	1994	1995
Angola	1.182	0.927	1.156	1.605	1.446	1.074
Benin	0.628	0.681	0.803	0.849	0.880	0.879
Botswana	1.519	1.436	1.498	1.360	1.187	1.091
Burkina Faso	0.632	0.629	0.561	0.592	0.639	0.642
Burundi	1.944	1.762	1.938	1.835	1.985	2.213
Cameroon	0.650	0.722	0.710	0.758	0.884	
Cape Verde	0.611	0.734	0.807	0.926	0.952	
Central African Republic	0.812	0.652	0.665	0.574	0.489	0.670
Chad	0.462	0.438	0.454	0.425	0.452	0.526
Comoros	1.199	0.945	1.156	1.175	1.377	1.209
Congo	0.757	0.740	0.686	0.513	0.343	
Côte d'Ivoire	1.195	1.140	1.248	1.137	1.133	1.098
Djibouti		1.024	1.102	1.148	1.249	1.256
Equatorial Guinea	1.021	0.795	0.907	0.868	0.619	0.456
Ethiopia	1.820	2.188	1.629	1.610	2.059	1.844
Gabon	0.564	0.721	0.730	0.695	0.684	0.881
Gambia, The	0.956	0.870	0.993	0.891		
Ghana	1.182	1.338	1.134	1.319	1.485	1.432
Guinea	0.850	0.768	0.761	0.654	0.637	
Guinea-Bissau	0.824	0.669	0.396	0.567	0.754	0.775
Kenya	1.355	1.337	1.368	1.555	1.936	1.678
Lesotho	1.339	1.380	1.479	1.684	1.618	1.536
Madagascar	0.703	0.505	0.699	0.678	0.662	0.615
Malawi	1.225	1.110	0.951	1.189	0.973	1.002

Table 7. Sub-Saharan Africa: Index of Tax Effort with Random Effects (concluded)

Country	1990	1991	1992	1993	1994	1995
Mali	1.023	1.232	1.130	1.101	0.968	0.954
Mauritania	0.920	0.898	0.868	0.927	1.016	0.840
Mauritius	0.854	0.805	0.793	0.778	0.698	0.660
Namibia	1.106	1.277	1.221	1.240	1.246	1.310
Niger	0.679	0.663	0.646	0.633	0.600	0.707
Nigeria	0.581	0.471	0.400	0.394	0.459	0.574
Rwanda	1.137	0.906	0.794	0.747	0.294	0.609
São Tomé and Príncipe	0.655	0.658	0.818	0.770	0.647	0.592
Senegal	0.923	0.970	0.958	0.878	0.733	
Seychelles	1.692	1.534	1.548	1.612	1.556	1.316
Sierra Leone	0.874	1.012	1.062	1.202	1.033	
South Africa	1.178	1.139	1.106	1.139	1.175	1.160
Sudan	0.445	0.495	0.653	0.645	0.682	0.700
Swaziland	1.038	1.037	0.930	0.936	0.960	1.089
Tanzania	1.420	1.641	1.310	1.482	1.406	1.391
Togo	1.228	1.048	0.991	0.905	0.909	0.936
Uganda	1.004	0.846	0.929	1.009	1.221	1.027
Zambia	1.023	0.924	0.893	0.852	1.088	0.796
Zimbabwe	1.598	1.539	1.576	1.386	1.537	1.434

Source: Authors' estimations.

Figure 15. Sub-Saharan African Countries: Relationship of Tax Share to Predicted Tax Share, 1995 1/ 2/ 3/

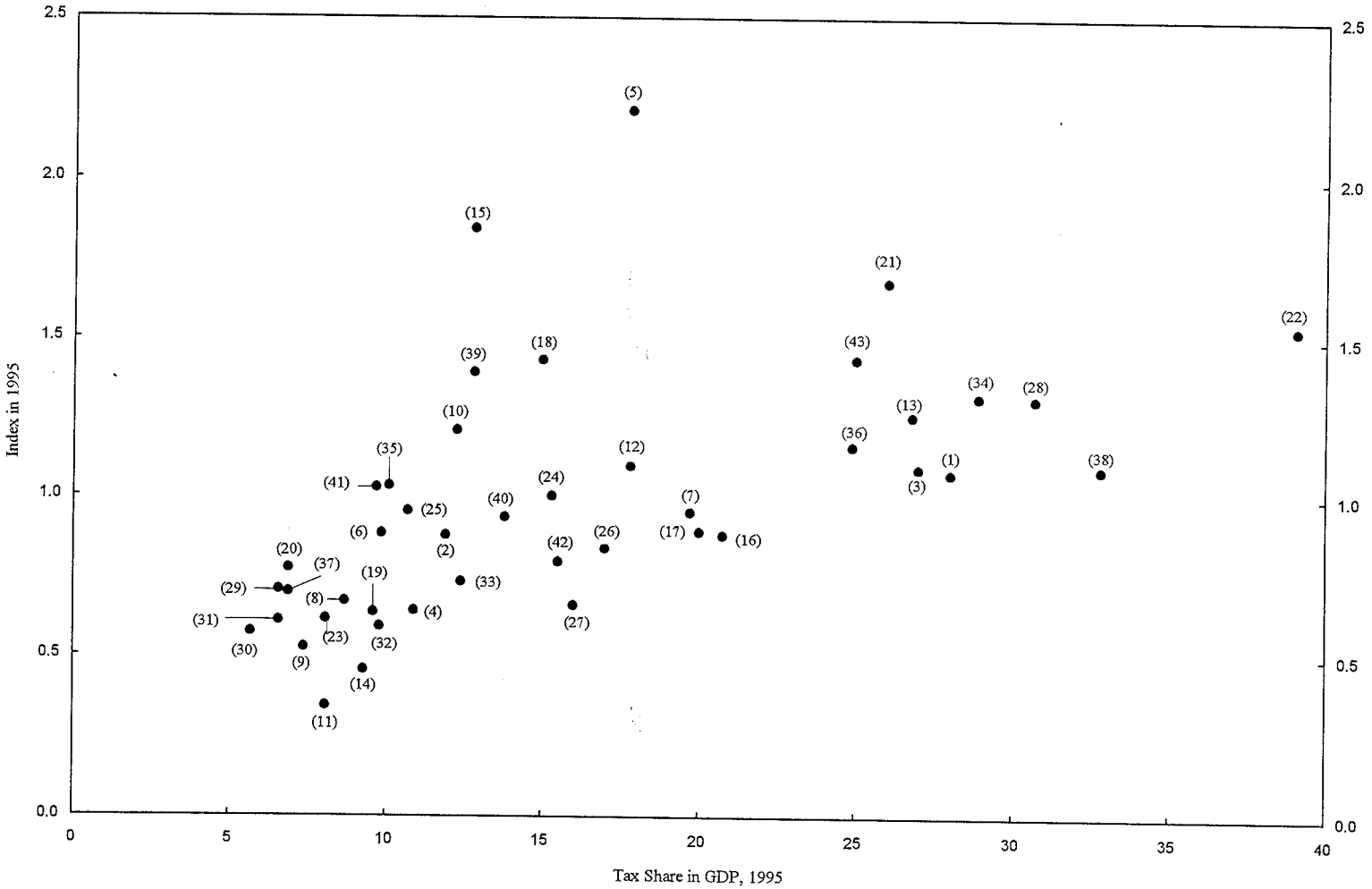


Sources: Data provided by the country authorities; and Fund staff calculations.

1/ Excluding Eritrea, Mozambique, and Zaïre.
2/ Data refer to 1993 for The Gambia.
3/ Data refer to 1994 for Cameroon, Cape Verde, the Congo, Guinea, Senegal, and Sierra Leone.

(1) Angola	(2) Benin	(3) Botswana	(4) Burkina Faso	(5) Burundi	(6) Cameroon	(7) Cape Verde	(8) Central African Republic
(9) Chad	(10) Comoros	(11) Congo	(12) Côte d'Ivoire	(13) Djibouti	(14) Equatorial Guinea	(15) Ethiopia	(16) Gabon
(17) Gambia, The	(18) Ghana	(19) Guinea	(20) Guinea-Bissau	(21) Kenya	(22) Lesotho	(23) Madagascar	(24) Malawi
(25) Mali	(26) Mauritania	(27) Mauritius	(28) Namibia	(29) Niger	(30) Nigeria	(31) Rwanda	(32) São Tomé and Príncipe
(33) Senegal	(34) Seychelles	(35) Sierra Leone	(36) South Africa	(37) Sudan	(38) Swaziland	(39) Tanzania	(40) Togo
(41) Uganda	(42) Zambia	(43) Zimbabwe					

Figure 16. Sub-Saharan African Countries: Relationship of Tax Share to Tax Index, 1995 1/ 2/ 3/

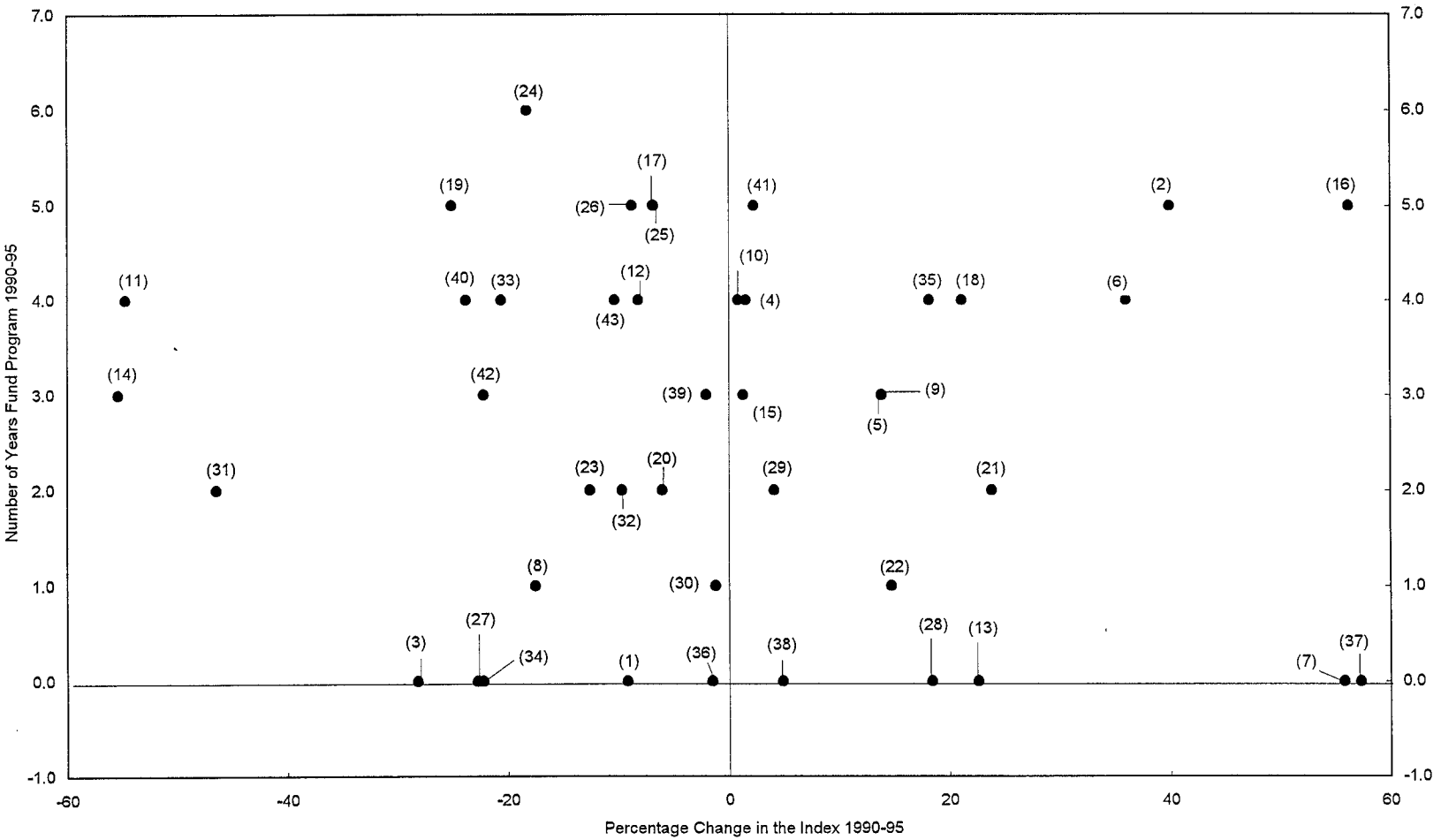


Sources: Data provided by the country authorities; and Fund staff calculations.

1/ Excluding Eritrea, Mozambique, and Zaïre.
2/ Data refer to 1993 for The Gambia.
3/ Data refer to 1994 for Cameroon, Cape Verde, the Congo, Guinea, Senegal, and Sierra Leone.

(1) Angola	(2) Benin	(3) Botswana	(4) Burkina Faso	(5) Burundi	(6) Cameroon	(7) Cape Verde	(8) Central African Republic
(9) Chad	(10) Comoros	(11) Congo	(12) Côte d'Ivoire	(13) Djibouti	(14) Equatorial Guinea	(15) Ethiopia	(16) Gabon
(17) Gambia, The	(18) Ghana	(19) Guinea	(20) Guinea-Bissau	(21) Kenya	(22) Lesotho	(23) Madagascar	(24) Malawi
(25) Mali	(26) Mauritania	(27) Mauritius	(28) Namibia	(29) Niger	(30) Nigeria	(31) Rwanda	(32) São Tomé and Príncipe
(33) Senegal	(34) Seychelles	(35) Sierra Leone	(36) South Africa	(37) Sudan	(38) Swaziland	(39) Tanzania	(40) Togo
(41) Uganda	(42) Zambia	(43) Zimbabwe					

Figure 17. Sub-Saharan African Countries: Relationship of Change in Indices to Fund Program, 1990-95 1/ 2/ 3/ 4/



Sources: Data provided by the country authorities; and Fund staff calculations.

1/ Excluding Eritrea, Mozambique, and Zaïre.

2/ Data refer to 1991-95 for Djibouti.

3/ Data refer to 1990-93 for The Gambia.

4/ Data refer to 1990-94 for Cameroon, Cape Verde, Guinea, Senegal, and Sierra Leone.

(1) Angola	(2) Benin	(3) Botswana	(4) Burkina Faso	(5) Burundi	(6) Cameroon	(7) Cape Verde	(8) Central African Republic
(9) Chad	(10) Comoros	(11) Congo	(12) Côte d'Ivoire	(13) Djibouti	(14) Equatorial Guinea	(15) Ethiopia	(16) Gabon
(17) Gambia, The	(18) Ghana	(19) Guinea	(20) Guinea-Bissau	(21) Kenya	(22) Lesotho	(23) Madagascar	(24) Malawi
(25) Mali	(26) Mauritania	(27) Mauritius	(28) Namibia	(29) Niger	(30) Nigeria	(31) Rwanda	(32) São Tomé and Príncipe
(33) Senegal	(34) Seychelles	(35) Sierra Leone	(36) South Africa	(37) Sudan	(38) Swaziland	(39) Tanzania	(40) Togo
(41) Uganda	(42) Zambia	(43) Zimbabwe					

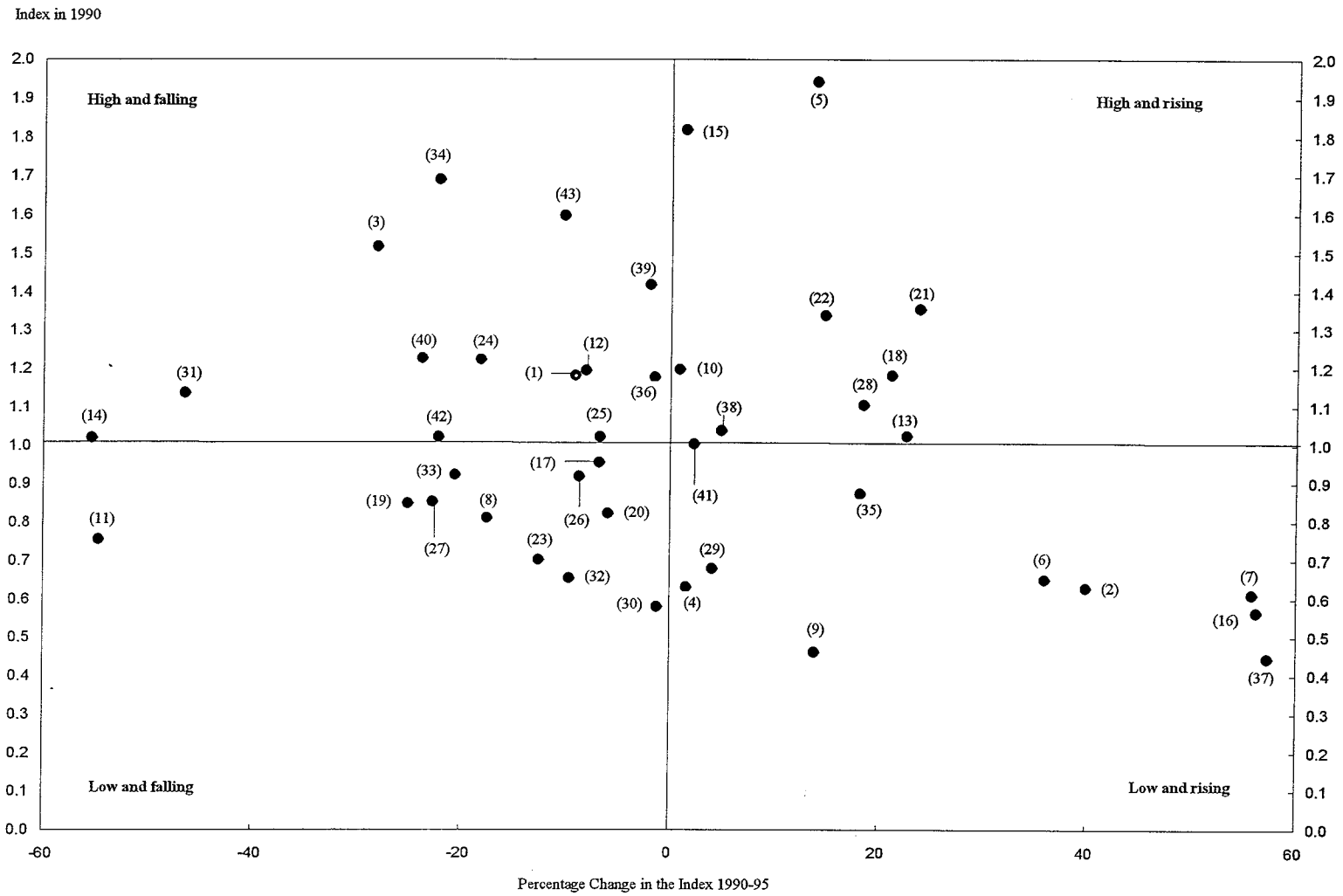
The tax effort indices are relatively stable over the 1990–95 period, though many countries have either an upward or downward trend (see Figure 18). Benin, Cameroon, Cape Verde, Gabon, and Sudan showed the greatest increases over the sample period while several other countries showed substantial increases. The Congo, Equatorial Guinea, and Rwanda showed the greatest declines over the sample period.

V. Conclusion

The results of this study suggest that significant determinants of tax revenue share are the share of agriculture in GDP and the share of mining in GDP. These variables are negative and significant. Other variables that are significant are the share of exports and in some specifications, per capita income or imports, all of which are positively related to the tax share. Fund programs do not appear to have a strong effect on the tax share on average, though there is some evidence with one specification that in 1991 Fund programs may have exerted a positive effect on tax share while with another specification in 1994 they exerted a negative effect. These results may, however, reflect difficulties in aggregating the objectives of Fund programs into a simple variable for use in aggregate analysis. Country-specific factors appear to be important determinants of tax share.

Countries with tax indices that are well above unity would appear to be making use of their tax bases to increase revenue. Some countries have substantially increased their tax effort in recent years while others have experienced marked declines. Since these changes may be both intentional and unintentional, no broad conclusion can necessarily be drawn about the desirability of these changes. The measures of tax effort do, however, have implications for fiscal policies in the event of a budgetary imbalance. Countries with low indices of tax effort may wish to place greater emphasis on increasing revenues rather than on reducing expenditures compared to countries with higher indices of tax effort.

Figure 18. Sub-Saharan African Countries: Change in Tax Indices, 1990-95 1/ 2/ 3/ 4/



Sources: Data provided by the country authorities; and Fund staff calculations.

1/ Excluding Eritrea, Mozambique, and Zaïre.

2/ Data refer to 1991-95 for Djibouti.

3/ Data refer to 1990-93 for The Gambia.

4/ Data refer to 1990-94 for Cameroon, Cape Verde, Guinea, Senegal, and Sierra Leone.

(1) Angola	(2) Benin	(3) Botswana	(4) Burkina Faso	(5) Burundi	(6) Cameroon	(7) Cape Verde	(8) Central African Republic
(9) Chad	(10) Comoros	(11) Congo	(12) Côte d'Ivoire	(13) Djibouti	(14) Equatorial Guinea	(15) Ethiopia	(16) Gabon
(17) Gambia, The	(18) Ghana	(19) Guinea	(20) Guinea-Bissau	(21) Kenya	(22) Lesotho	(23) Madagascar	(24) Malawi
(25) Mali	(26) Mauritania	(27) Mauritius	(28) Namibia	(29) Niger	(30) Nigeria	(31) Rwanda	(32) São Tomé and Príncipe
(33) Senegal	(34) Seychelles	(35) Sierra Leone	(36) South Africa	(37) Sudan	(38) Swaziland	(39) Tanzania	(40) Togo
(41) Uganda	(42) Zambia	(43) Zimbabwe					

APPENDIX I.

SUB-SAHARAN AFRICA DATA

Data sources and classification

Frequency:	Annual
Period:	1990–95
Units:	In millions of U.S. dollars
	In billions of national currency
Sample size:	46 countries (list attached)

Sources

International Financial Statistics (IFS)
World Economic Outlook (WEO)
Recent Economic Developments (REDs)
World Bank Database
IMF, Information Notice System (INS)

List of variables	Source documentation
Domestic income:	GDP; IFS code 99b and REDs in current units of national currency.
Population:	IFS code 99z. WEO and REDs.
Exchange rate:	IFS code RF (in national currency per U.S. dollar, period average).
Imports:	IFS code 78aad, in current U.S. dollars and REDs.
Exports:	IFS code 78abd, in current U.S. dollars and REDs.
Agricultural output:	World Bank Database and REDs in current units of national currency.
Mining output:	World Bank Database and REDs in current units of national currency.
Manufacturing output:	World Bank Database and REDs in current units of national currency.
GDP per capita, ppp based:	WEO.

List of variables	Source documentation
Revenue and tax revenue:	Recent Economic Development (REDs) reports.
Consumer price index:	IFS code 64, INS, and WEO.
List of countries with and without a Fund-supported program:	IFS.
List of SPA countries:	African Department.
CFA franc zone countries:	IFS.

List of countries

Sub-Saharan African countries:[18]

Angola	Madagascar
Benin	Malawi
Botswana	Mali
Burkina Faso	Mauritania
Burundi	Mauritius
Cameroon	Mozambique
Cape Verde	Namibia
Central African Republic	Niger
Chad	Nigeria
Comoros	Rwanda
Congo	São Tomé and Príncipe
Côte d'Ivoire	Senegal
Djibouti	Seychelles
Equatorial Guinea	Sierra Leone
Eritrea	South Africa
Ethiopia	Sudan
Gabon	Swaziland
Gambia, The	Tanzania
Ghana	Togo
Guinea	Uganda
Guinea-Bissau	Zaïre
Kenya	Zambia
Lesotho	Zimbabwe

[18]Excludes Liberia and Somalia.

List of SPA countries

Benin
Burkina Faso
Burundi
Cameroon
Central African Republic
Chad
Comoros
Congo
Côte d'Ivoire
Equatorial Guinea
Eritrea
Ethiopia
Gambia, The
Ghana
Guinea
Guinea-Bissau
Kenya
Madagascar
Malawi
Mali
Mauritania
Mozambique
Niger
Rwanda
São Tomé and Príncipe
Senegal
Sierra Leone
Tanzania
Togo
Uganda
Zambia

List of CFA franc zone countries[19]

Benin
Burkina Faso
Cameroon
Central African Republic
Chad
Congo
Côte d'Ivoire
Equatorial Guinea
Gabon
Guinea-Bissau (new member as of May 1997)
Mali
Niger
Senegal
Togo

[19]The Comoros is a member of the franc zone but not of the respective monetary unions.

Note on sources and classification of the data

Fiscal data have been taken mainly from Recent Economic Development (REDs) reports; (e.g., tables that depict general government revenue, central government revenue, and budgetary revenue). For calculation purposes, GDP is obtained from the same source. In cases where data are missing, figures are provided from unpublished Fund sources.

For most of the sub-Saharan African countries, Recent Economic Development (REDs) reports provide central government revenue. However, for Angola, Ethiopia, Mozambique, Niger, Nigeria, Rwanda, Seychelles, and Togo, REDs provide general government revenue. For a few countries, the fiscal data have been reclassified.[20]

Import and export data have been taken mainly from the *International Financial Statistics* (*IFS*). In some cases, unpublished estimated data have been used when this information was not available. Data on agriculture, mining, and manufacturing were obtained from the World Bank Database. This information has been supplemented with data from REDs.

The definition of the fiscal year and observation year varies, depending on the country. If the fiscal year is the calendar year, the observation year is the same as the calendar year. If the fiscal year runs from April 1 to March 31, then the observation year is the year corresponding to April to December of the fiscal year. That is, observation year 1990 is fiscal year April 1990 to March 1991. If the fiscal year runs from July 1 to June 30, then the observation year is the calendar year corresponding to July to December of the fiscal year. That is, observation year 1990 is fiscal year July 1990 to June 1991. These are the only three definitions of fiscal years in the sample. We experimented with different matches of calendar and fiscal year and found the results robust to the choice of matching. For instance, we constructed fiscal years that corresponded to the calendar year by averaging pieces of two fiscal years. We also matched fiscal years ending in the calendar year rather than beginning in the calendar year as described above.

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[20]In most instances, the study follows the classification scheme used in the data sources. Since the revenue data come from Recent Economic Development (REDs) reports, the classification scheme used is *A Manual of Government Finance Statistics.*

Table 8. Sub–Saharan African Countries: Selected Economic Indicators, 1990–95 1/

	GDP Per Capita (In U.S. dollars)	Population (In millions)	Agriculture	Mining	Manufacturing	Goods Exports: f.o.b (In millions of U.S. dollars)	Goods Imports: f.o.b (In millions of U.S. dollars)	Total Revenue	Tax Revenue	Tax Revenue (In percent of Nonagriculture GDP)	SPA Countries *	Country with Fund–supported Program	CFA Franc Zone and Non–CFA Franc Zone Countries *
			(In percent of GDP)					(In percent of GDP)					
Angola													
1990	1,026.1	10.0	17.9	32.7	5.0	3883.9	−1578.2	25.6	22.4	27.3	0.0	0.0	0.0
1991	1,262.1	9.5	24.0	20.8	6.2	3449.3	−1347.2	18.3	14.8	19.4	0.0	0.0	0.0
1992	753.6	10.6	13.7	40.5	4.1	3832.8	−1988.0	25.8	25.3	29.3	0.0	0.0	0.0
1993	566.4	10.3	11.1	43.0	5.3	2900.5	−1462.6	37.3	36.6	41.2	0.0	0.0	0.0
1994	402.4	10.7	6.2	59.2	6.7	3016.5	−1454.0	39.8	39.2	41.8	0.0	0.0	0.0
1995	484.6	11.1	7.8	57.1	6.9	3722.5	−1458.4	28.3	28.0	30.4	0.0	0.0	0.0
Benin													
1990	389.2	4.7	36.1	1.0	7.8	287.2	−427.9	9.9	7.9	12.3	1.0	1.0	1.0
1991	388.3	4.9	37.0	0.8	7.5	336.8	−482.4	11.5	8.8	14.0	1.0	1.0	1.0
1992	427.0	5.0	36.8	0.6	7.9	371.4	−560.6	12.2	10.0	15.9	1.0	0.0	1.0
1993	407.1	5.2	35.8	0.6	7.8	341.1	−538.9	12.9	10.9	17.0	1.0	1.0	1.0
1994	285.9	5.3	34.5	0.8	7.6	301.0	−365.8	12.5	10.7	16.4	1.0	1.0	1.0
1995	373.2	5.6	33.9	0.7	8.1	405.2	−556.9	14.4	11.9	18.0	1.0	1.0	1.0
Botswana													
1990	2,830.4	1.3	5.1	41.5	4.2	1795.4	−1610.9	50.7	39.8	42.0	0.0	0.0	0.0
1991	2,893.2	1.3	4.4	37.3	4.9	1871.1	−1604.0	47.8	36.9	38.6	0.0	0.0	0.0
1992	3,046.2	1.4	4.9	33.3	4.9	1743.9	−1556.6	49.9	37.0	38.9	0.0	0.0	0.0
1993	2,922.6	1.4	4.5	35.4	4.5	1722.2	−1455.4	46.5	33.1	34.6	0.0	0.0	0.0
1994	3,091.8	1.4	4.2	32.6	4.7	1878.4	−1350.0	35.1	29.0	30.2	0.0	0.0	0.0
1995	3,400.1	1.5	3.7	34.2	4.6	2164.4	−1578.7	36.5	27.0	28.0	0.0	0.0	0.0
Burkina Faso													
1990	307.2	9.0	17.6	--	15.3	280.5	−542.5	12.3	10.2	12.3	1.0	0.0	1.0
1991	303.4	9.2	19.6	--	13.9	269.1	−490.5	13.4	10.1	12.6	1.0	1.0	1.0
1992	317.1	9.4	17.8	--	15.1	237.2	−458.9	11.7	8.7	10.6	1.0	0.0	1.0
1993	290.4	9.7	18.7	--	15.1	226.1	−469.1	12.7	9.3	11.4	1.0	1.0	1.0
1994	182.1	10.2	15.7	--	19.3	215.6	−344.3	11.0	10.1	12.0	1.0	1.0	1.0
1995	228.4	10.2	15.2	--	20.0	247.3	−494.1	11.9	10.9	12.9	1.0	1.0	1.0
Burundi													
1990	207.3	5.5	51.1	0.8	8.0	72.8	−189.0	15.1	13.1	26.8	1.0	0.0	0.0
1991	207.7	5.6	48.6	0.8	8.1	93.0	−195.9	16.9	14.9	28.9	1.0	1.0	0.0
1992	188.1	5.8	49.2	0.8	8.6	77.0	−181.8	16.9	14.5	28.5	1.0	1.0	0.0
1993	162.9	5.8	48.6	0.7	8.0	73.9	−172.8	17.4	14.9	28.9	1.0	1.0	0.0
1994	165.4	5.9	47.3	0.6	8.1	80.7	−172.6	17.2	15.9	30.1	1.0	0.0	0.0
1995	177.4	6.0	47.8	0.5	7.5	112.5	−175.6	18.8	17.8	34.1	1.0	0.0	0.0
Cameroon													
1990	1,060.6	11.5	24.3	9.0	14.2	2125.4	−1347.2	15.2	9.6	12.7	1.0	1.0	1.0
1991	977.4	11.8	26.6	6.9	13.9	2156.1	−1249.1	15.7	10.2	13.8	1.0	0.0	1.0
1992	984.8	12.2	27.3	5.7	13.3	1939.3	−1025.0	13.6	9.5	13.1	1.0	1.0	1.0
1993	926.7	12.5	38.7	9.2	9.7	1652.8	−1022.6	10.1	7.8	12.7	1.0	0.0	1.0
1994	528.0	12.9	39.2	8.8	10.0	1432.2	−1016.1	12.9	9.9	16.2	1.0	1.0	1.0
1995	656.3	13.3	--	--	--	1660.9	−1073.2	14.3	10.6	--	1.0	1.0	1.0
Cape Verde													
1990	905.6	0.3	12.9	--	--	5.6	−119.5	15.3	11.0	15.2	0.0	0.0	0.0
1991	912.5	0.3	11.4	--	--	4.1	−132.1	17.6	13.6	15.4	0.0	0.0	0.0
1992	994.6	0.4	10.3	--	--	4.4	−173.3	20.6	15.6	17.4	0.0	0.0	0.0
1993	894.8	0.4	9.6	--	--	3.9	−151.5	23.7	17.9	19.8	0.0	0.0	0.0
1994	914.0	0.4	7.6	--	--	4.9	−195.1	25.0	19.7	21.3	0.0	0.0	0.0
1995	1,103.5	0.4	--	--	--	8.4	−232.2	26.1	19.9	--	0.0	0.0	0.0

Table 8. Sub-Saharan African Countries: Selected Economic Indicators, 1990-95 1/ (continued)

	GDP Per Capita (In U.S. dollars)	Population (In millions)	Agriculture (In percent of GDP)	Mining (In percent of GDP)	Manufacturing (In percent of GDP)	Goods Exports: f.o.b (In millions of U.S. dollars)	Goods Imports: f.o.b (In millions of U.S. dollars)	Total Revenue (In percent of GDP)	Tax Revenue (In percent of GDP)	Tax Revenue (In percent of Nonagriculture GDP)	SPA Countries *	Country with Fund-supported Program	CFA Franc Zone and Non-CFA Franc Zone Countries *
Central African Republic													
1990	498.9	2.9	29.2	4.0	10.6	160.2	-257.0	10.9	10.6	15.0	1.0	0.0	1.0
1991	459.5	3.0	27.2	4.4	11.4	136.7	-194.6	9.4	8.6	11.8	1.0	0.0	1.0
1992	449.4	3.1	27.6	4.6	10.7	111.5	-181.6	9.3	8.5	11.8	1.0	0.0	1.0
1993	398.5	3.2	27.8	4.9	10.1	127.2	-152.0	8.0	7.4	10.3	1.0	0.0	1.0
1994	299.3	3.0	28.0	7.3	8.8	156.6	-144.6	7.1	6.5	9.0	1.0	1.0	1.0
1995	344.1	3.3	31.2	5.8	8.2	175.9	-191.2	9.1	8.7	12.6	1.0	0.0	1.0
Chad													
1990	215.1	5.7	19.5	0.2	20.5	230.3	-259.5	9.9	7.9	9.4	1.0	1.0	1.0
1991	227.0	5.8	29.6	0.2	15.4	193.5	-249.9	7.7	5.9	8.4	1.0	0.0	1.0
1992	222.3	6.0	27.5	0.2	15.3	182.3	-243.0	8.0	6.3	8.7	1.0	0.0	1.0
1993	169.2	6.1	24.2	0.2	16.1	151.8	-215.2	8.7	6.4	8.5	1.0	0.0	1.0
1994	133.7	6.2	33.6	0.0	13.5	135.3	-212.1	6.8	5.6	8.4	1.0	1.0	1.0
1995	165.5	6.4	31.2	0.0	15.7	230.4	-222.8	8.4	7.4	11.0	1.0	1.0	1.0
Comoros													
1990	461.7	0.5	40.5	--	4.1	17.6	-57.1	17.0	12.1	20.3	1.0	0.0	0.0
1991	439.8	0.6	39.7	--	4.2	24.4	-61.6	13.9	10.9	18.2	1.0	1.0	0.0
1992	465.1	0.6	38.7	--	4.4	21.4	-74.0	15.0	12.9	21.0	1.0	1.0	0.0
1993	434.9	0.6	38.7	--	4.4	21.2	-63.2	14.5	12.6	20.6	1.0	0.0	0.0
1994	295.6	0.6	40.5	--	6.4	10.8	-57.1	14.3	12.6	21.2	1.0	1.0	0.0
1995	331.7	0.6	41.9	--	5.8	11.4	-68.3	14.2	12.3	21.1	1.0	1.0	0.0
Congo													
1990	1,255.0	2.2	12.9	28.9	8.3	1390.6	-512.7	25.8	16.9	19.4	1.0	1.0	1.0
1991	1,184.7	2.3	11.3	23.7	9.0	1108.1	-506.9	25.3	16.3	18.4	1.0	1.0	1.0
1992	1,191.4	2.4	11.6	22.6	8.9	1178.7	-438.6	22.5	14.3	16.8	1.0	0.0	1.0
1993	1,019.7	2.4	10.8	25.8	9.0	1118.6	-541.7	24.1	11.1	13.5	1.0	0.0	1.0
1994	626.0	2.5	10.2	33.7	7.3	958.9	-612.8	22.8	8.1	9.9	1.0	1.0	1.0
1995	666.6	2.6	--	--	--	1250.5	-669.0	24.8	12.9	--	1.0	1.0	1.0
Côte d'Ivoire													
1990	921.1	11.7	32.8	0.2	--	2912.6	-1818.8	21.5	17.6	26.1	1.0	1.0	1.0
1991	860.7	12.2	33.5	0.2	--	2705.0	-1781.6	19.5	16.9	25.4	1.0	1.0	1.0
1992	880.3	12.7	34.2	0.2	--	2946.8	-1952.1	20.1	16.9	25.7	1.0	0.0	1.0
1993	789.4	13.2	35.1	0.3	16.9	2518.7	-1770.4	17.6	14.8	22.7	1.0	0.0	1.0
1994	543.8	13.7	31.0	--	19.8	2853.7	-1637.6	20.5	16.4	23.8	1.0	1.0	1.0
1995	708.4	14.2	31.6	--	--	3938.9	-2468.4	21.9	17.8	26.1	1.0	1.0	1.0
Djibouti													
1990	803.0	0.5	2.9	--	4.8	--	--	27.9	25.4	26.2	0.0	0.0	0.0
1991	859.6	0.5	2.8	--	4.4	71.6	-258.2	25.8	24.2	24.9	0.0	0.0	0.0
1992	854.3	0.5	2.6	--	4.7	53.2	-259.1	26.9	25.4	26.1	0.0	0.0	0.0
1993	841.7	0.6	2.8	--	4.7	71.2	-255.1	28.4	26.8	27.6	0.0	0.0	0.0
1994	854.8	0.6	2.8	--	4.5	56.4	-237.1	29.6	28.1	28.9	0.0	0.0	0.0
1995	853.7	0.6	3.0	--	4.7	33.5	-204.9	28.4	26.8	27.6	0.0	0.0	0.0
Equatorial Guinea													
1990	377.5	0.3	39.9	0.0	1.5	37.8	-51.8	21.1	14.3	23.8	1.0	0.0	1.0
1991	362.8	0.4	39.6	0.0	1.7	35.7	-90.4	20.9	13.5	22.4	1.0	1.0	1.0
1992	385.8	0.4	38.6	11.2	1.7	51.8	-62.2	21.0	14.1	25.6	1.0	0.0	1.0
1993	354.5	0.4	37.8	16.2	1.7	52.3	-52.4	20.8	13.9	26.0	1.0	1.0	1.0
1994	263.5	0.4	35.0	--	1.5	65.1	-34.4	16.9	10.9	21.0	1.0	1.0	1.0
1995	336.6	0.4	35.9	--	1.3	86.4	-75.9	14.9	9.3	19.3	1.0	0.0	1.0

Table 8. Sub-Saharan African Countries: Selected Economic Indicators, 1990-95 1/ (continued)

	GDP Per Capita (In U.S. dollars)	Population (In millions)	Agriculture (In percent of GDP)	Mining (In percent of GDP)	Manufacturing (In percent of GDP)	Goods Exports: f.o.b (In millions of U.S. dollars)	Goods Imports: f.o.b (In millions of U.S. dollars)	Total Revenue (In percent of GDP)	Tax Revenue (In percent of GDP)	Tax Revenue (In percent of Nonagriculture GDP)	SPA Countries *	Country with Fund-supported Program	CFA Franc Zone and Non-CFA Franc Zone Countries *
Eritrea													
1990	--	--	--	--	--	--	--	--	--	--	1.0	0.0	--
1991	--	--	--	--	--	--	--	--	--	--	1.0	0.0	--
1992	285.4	3.0	21.2	0.0	6.4	15.2	-278.0	20.4	12.4	15.7	1.0	0.0	--
1993	201.2	3.1	8.9	0.0	6.6	36.1	-275.0	28.7	16.7	18.3	1.0	0.0	--
1994	253.4	3.2	11.1	0.0	5.8	64.5	-396.0	23.3	14.9	16.8	1.0	0.0	--
1995	230.4	3.3	8.3	0.0	8.3	80.5	-403.8	28.7	15.3	16.7	1.0	0.0	--
Ethiopia													
1990	176.1	51.7	51.6	--	3.0	292.0	-912.1	13.7	10.4	21.4	1.0	0.0	0.0
1991	181.6	53.4	57.2	--	2.8	167.6	-470.8	10.9	8.0	18.6	1.0	0.0	0.0
1992	157.7	52.4	54.2	--	3.9	169.9	-992.7	11.9	8.2	18.0	1.0	0.0	0.0
1993	100.1	53.9	50.8	--	4.3	198.8	-706.0	13.7	10.7	21.8	1.0	1.0	0.0
1994	100.8	55.6	50.2	--	4.5	372.0	-925.7	18.4	12.5	25.1	1.0	1.0	0.0
1995	98.9	57.3	51.9	--	4.3	423.0	-1147.9	17.9	12.4	25.1	1.0	1.0	0.0
Gabon													
1990	4,718.2	1.1	8.6	35.1	11.7	2488.8	-805.1	21.5	12.9	14.1	0.0	1.0	1.0
1991	4,578.7	1.2	8.3	32.5	11.6	2227.9	-861.0	24.3	16.6	18.1	0.0	1.0	1.0
1992	4,621.9	1.2	8.4	31.0	11.8	2259.2	-886.3	22.9	16.2	17.8	0.0	1.0	1.0
1993	5,355.7	1.0	8.3	30.1	11.6	2326.2	-845.1	22.6	15.6	17.1	0.0	0.0	1.0
1994	3,274.1	1.3	8.0	--	11.1	2349.4	-756.5	23.5	15.5	18.1	0.0	1.0	1.0
1995	3,876.9	1.3	8.1	--	11.4	2685.4	-882.2	28.6	20.7	24.3	0.0	1.0	1.0
Gambia, The													
1990	344.5	0.9	22.5	--	5.7	110.6	-140.5	20.3	19.8	23.7	1.0	1.0	0.0
1991	330.0	1.0	22.5	--	5.6	142.9	-185.0	22.5	20.4	24.8	1.0	1.0	0.0
1992	394.8	0.9	19.9	--	5.8	146.9	-177.8	23.8	21.8	26.3	1.0	1.0	0.0
1993	353.1	1.0	22.4	--	5.6	157.0	-214.5	22.6	20.0	25.7	1.0	1.0	0.0
1994	331.2	1.1	--	--	--	125.0	-181.6	19.5	17.4	--	1.0	1.0	0.0
1995	321.6	1.1	--	--	--	123.0	-162.5	--	--	--	1.0	0.0	0.0
Ghana													
1990	414.5	15.0	47.9	1.8	9.2	890.6	-1205.0	11.8	10.8	20.7	1.0	1.0	0.0
1991	452.2	15.5	48.6	1.8	8.7	997.6	-1318.7	13.8	12.4	24.2	1.0	1.0	0.0
1992	431.3	16.0	48.6	1.9	8.7	986.4	-1456.7	11.1	10.0	19.5	1.0	1.0	0.0
1993	369.9	16.4	47.8	1.9	9.1	1063.7	-1728.0	16.7	12.9	24.7	1.0	0.0	0.0
1994	305.5	16.9	44.8	2.1	9.4	1226.8	-1579.9	24.9	17.0	30.8	1.0	0.0	0.0
1995	361.7	17.4	43.9	1.7	9.4	1431.2	-1041.7	22.3	15.0	26.8	1.0	1.0	0.0
Guinea													
1990	490.1	5.7	20.1	22.2	4.1	671.2	-585.7	15.8	14.6	18.2	1.0	0.0	0.0
1991	502.9	5.9	20.3	21.7	4.1	687.1	-694.9	14.7	13.8	17.3	1.0	1.0	0.0
1992	486.0	6.1	20.5	22.2	4.1	517.1	-608.3	13.5	12.5	15.7	1.0	1.0	0.0
1993	503.6	6.3	20.4	20.1	4.1	561.1	-582.6	11.6	10.8	13.5	1.0	1.0	0.0
1994	522.3	6.5	20.5	19.8	4.1	515.7	-685.3	10.4	9.6	12.1	1.0	1.0	0.0
1995	548.2	6.7	20.3	--	4.0	582.7	-621.7	11.0	10.3	13.0	1.0	1.0	0.0
Guinea-Bissau													
1990	246.2	1.0	44.0	--	8.1	19.3	-68.1	19.3	8.0	14.3	1.0	0.0	0.0
1991	242.2	1.0	44.0	--	8.4	20.4	-67.5	13.4	6.5	11.6	1.0	0.0	0.0
1992	220.3	1.0	43.8	--	8.4	6.5	-83.5	12.1	3.9	7.0	1.0	0.0	0.0
1993	234.4	1.0	44.9	--	8.0	16.0	-53.8	10.4	5.0	9.0	1.0	0.0	0.0
1994	231.0	1.0	45.0	--	7.5	33.2	-53.8	12.4	6.8	12.1	1.0	1.0	0.0
1995	239.9	1.1	45.9	--	6.6	23.9	-59.3	12.6	6.9	12.7	1.0	1.0	0.0

Table 8. Sub-Saharan African Countries: Selected Economic Indicators, 1990-95 1/ (continued)

	GDP Per Capita (In U.S. dollars)	Population (In millions)	Agriculture (In percent of GDP)	Mining (In percent of GDP)	Manufacturing (In percent of GDP)	Goods Exports: f.o.b (In millions of U.S. dollars)	Goods Imports: f.o.b (In millions of U.S. dollars)	Total Revenue (In percent of GDP)	Tax Revenue (In percent of GDP)	Tax Revenue (In percent of Nonagriculture GDP)	SPA Countries *	Country with Fund-supported Program	CFA Franc Zone and Non-CFA Franc Zone Countries *
Kenya													
1990	355.1	24.0	25.0	0.2	10.1	1090.2	-2005.3	23.7	20.1	28.4	1.0	0.0	0.0
1991	271.9	25.9	28.1	0.3	12.0	1185.3	-1697.3	24.5	19.8	27.5	1.0	0.0	0.0
1992	275.4	25.7	28.7	0.3	10.8	1108.5	-1608.7	24.2	20.0	27.9	1.0	0.0	0.0
1993	174.0	28.1	31.5	0.2	10.0	1262.6	-1509.6	27.5	24.5	37.0	1.0	1.0	0.0
1994	211.5	29.3	32.4	0.2	10.4	1537.0	-1775.3	28.8	25.0	37.4	1.0	1.0	0.0
1995	252.4	30.5	31.0	0.2	10.9	1914.3	-2652.4	29.2	26.0	37.3	1.0	0.0	0.0
Lesotho													
1990	349.6	1.8	15.6	0.4	10.3	56.4	-748.2	38.8	34.0	42.0	0.0	1.0	0.0
1991	371.7	1.8	9.2	0.2	11.0	78.9	-856.3	43.4	37.2	43.2	0.0	0.0	0.0
1992	406.6	1.9	7.4	0.1	12.7	112.1	-899.6	46.5	40.2	45.0	0.0	0.0	0.0
1993	405.0	1.9	11.9	0.1	14.7	138.6	-853.6	49.4	43.0	48.8	0.0	0.0	0.0
1994	428.9	2.0	13.4	0.1	14.9	157.7	-955.4	47.3	41.7	46.6	0.0	0.0	0.0
1995	486.7	2.0	10.9	0.1	15.4	180.4	-1038.5	46.5	39.1	42.0	0.0	0.0	0.0
Madagascar													
1990	275.1	11.2	29.5	0.5	--	317.6	-566.4	10.1	9.4	13.4	1.0	1.0	0.0
1991	233.0	11.5	30.7	0.4	--	335.1	-445.9	7.2	6.8	9.9	1.0	1.0	0.0
1992	223.6	13.4	30.9	0.3	--	326.7	-470.8	9.0	8.7	12.5	1.0	0.0	0.0
1993	243.4	13.8	31.6	0.3	--	334.6	-514.4	8.6	8.2	11.9	1.0	0.0	0.0
1994	208.2	14.3	36.6	0.3	--	450.1	-545.8	8.2	7.7	12.1	1.0	0.0	0.0
1995	217.0	14.8	31.4	0.2	--	506.6	-628.1	8.3	8.1	11.9	1.0	0.0	0.0
Malawi													
1990	224.1	8.3	33.3	--	13.6	406.4	-280.3	19.6	16.7	25.8	1.0	1.0	0.0
1991	254.5	8.6	34.8	--	13.0	475.7	-615.4	18.9	16.3	26.2	1.0	1.0	0.0
1992	210.6	8.8	28.3	--	14.6	397.3	-712.5	18.4	15.5	22.0	1.0	1.0	0.0
1993	222.5	9.1	39.1	--	11.8	317.2	-627.4	17.1	14.8	25.8	1.0	1.0	0.0
1994	135.6	9.5	31.3	--	13.7	372.4	-554.8	15.9	14.5	21.7	1.0	1.0	0.0
1995	137.9	9.8	36.8	--	13.4	421.2	-554.6	17.6	15.3	26.0	1.0	1.0	0.0
Mali													
1990	303.6	8.2	45.1	1.6	8.2	337.9	-432.4	17.2	9.8	17.8	1.0	1.0	1.0
1991	254.2	9.5	43.4	2.1	8.6	355.9	-446.9	16.1	12.1	21.4	1.0	0.0	1.0
1992	289.9	9.8	44.6	2.1	8.4	335.9	-484.5	13.4	10.4	18.7	1.0	1.0	1.0
1993	263.2	10.1	42.4	2.2	8.9	341.1	-446.5	13.9	11.1	19.2	1.0	1.0	1.0
1994	177.1	10.5	40.2	2.7	6.4	319.7	-421.6	13.5	10.0	16.8	1.0	1.0	1.0
1995	228.6	10.8	43.9	2.7	6.2	469.0	-774.0	14.4	10.7	19.0	1.0	1.0	1.0
Mauritania													
1990	509.8	2.0	26.6	11.1	9.2	443.9	-382.9	24.6	18.3	25.0	1.0	1.0	0.0
1991	554.0	2.0	25.9	10.6	9.2	435.8	-399.1	22.3	16.6	22.3	1.0	0.0	0.0
1992	564.3	2.1	23.8	7.8	10.1	406.8	-461.3	21.2	16.5	21.6	1.0	1.0	0.0
1993	436.9	2.2	23.8	9.1	11.1	403.0	-400.4	25.0	19.1	25.0	1.0	1.0	0.0
1994	464.6	2.2	22.7	10.1	9.7	399.7	-352.3	23.2	17.9	23.2	1.0	1.0	0.0
1995	468.5	2.3	22.3	9.6	10.1	493.0	-365.6	24.0	17.0	21.9	1.0	1.0	0.0
Mauritius													
1990	2,565.4	1.0	10.2	0.1	19.8	1238.1	-1494.8	22.9	21.7	25.7	0.0	0.0	0.0
1991	2,722.4	1.0	9.5	0.1	19.8	1253.4	-1438.5	22.6	20.0	23.3	0.0	0.0	0.0
1992	3,037.3	1.0	9.2	0.1	20.1	1334.7	-1493.9	21.3	19.3	22.8	0.0	0.0	0.0
1993	3,019.9	1.1	8.3	0.1	19.8	1334.4	-1576.0	21.9	19.2	22.1	0.0	0.0	0.0
1994	3,253.4	1.1	7.9	0.1	20.1	1376.9	-1773.9	19.6	16.9	19.0	0.0	0.0	0.0
1995	3,614.6	1.1	8.3	0.1	20.8	1571.7	-1812.2	17.5	16.0	18.3	0.0	0.0	0.0

Table 8. Sub-Saharan African Countries: Selected Economic Indicators, 1990-95 1/ (continued)

	GDP Per Capita (In U.S. dollars)	Population (In millions)	Agriculture	Mining	Manufacturing	Goods Exports: f.o.b (In millions of U.S. dollars)	Goods Imports: f.o.b (In millions of U.S. dollars)	Total Revenue (In percent of GDP)	Tax Revenue (In percent of GDP)	Tax Revenue (In percent of Nonagriculture GDP)	SPA Countries *	Country with Fund-supported Program	CFA Franc Zone and Non-CFA Franc Zone Countries *
			(In percent of GDP)										
Mozambique													
1990	102.0	14.1	38.3	--	--	126.4	-790.0	22.2	19.9	32.2	1.0	1.0	0.0
1991	99.4	14.4	36.0	--	--	162.3	-809.0	21.8	18.5	28.9	1.0	1.0	0.0
1992	84.0	14.8	30.5	--	--	139.3	-798.0	21.1	18.4	26.4	1.0	1.0	0.0
1993	90.5	15.6	30.9	--	--	132.0	-955.0	20.0	18.2	26.3	1.0	1.0	0.0
1994	86.6	16.6	28.7	--	--	150.0	-1019.0	17.6	16.1	22.6	1.0	1.0	0.0
1995	83.1	17.4	--	--	--	169.0	-784.0	18.3	16.7	--	1.0	1.0	0.0
Namibia													
1990	1,681.4	1.3	10.5	18.5	6.3	1085.8	-1117.8	31.5	27.4	31.6	0.0	0.0	0.0
1991	1,730.2	1.4	11.0	16.7	5.5	1213.9	-1119.8	36.7	31.8	37.4	0.0	0.0	0.0
1992	1,942.1	1.4	9.2	14.3	6.4	1326.9	-1262.5	35.5	30.5	34.1	0.0	0.0	0.0
1993	1,750.8	1.5	9.7	10.3	7.9	1279.4	-1212.2	34.1	31.1	36.5	0.0	0.0	0.0
1994	1,951.4	1.5	12.7	12.3	8.1	1336.7	-1279.0	33.5	29.4	34.6	0.0	0.0	0.0
1995	2,017.2	1.5	12.8	9.7	6.4	1369.1	-1467.1	34.1	30.7	36.8	0.0	0.0	0.0
Niger													
1990	320.9	7.7	35.3	5.3	6.6	303.4	-337.5	10.3	7.9	12.2	1.0	1.0	1.0
1991	291.3	8.0	37.5	5.3	6.7	283.9	-273.3	8.5	7.0	11.2	1.0	0.0	1.0
1992	283.9	8.3	37.1	5.6	6.8	265.6	-266.3	8.6	6.8	10.9	1.0	0.0	1.0
1993	265.6	8.4	37.1	5.6	6.9	238.4	-244.0	7.3	6.6	10.5	1.0	0.0	1.0
1994	176.6	8.8	42.9	4.0	6.6	226.4	-245.5	6.1	5.4	9.5	1.0	1.0	1.0
1995	205.5	9.1	42.9	4.0	6.6	247.0	-242.6	7.2	6.6	11.6	1.0	0.0	1.0
Nigeria 2/ 3/													
1990	337.2	96.1	32.4	33.3	5.5	13914.0	-7070.0	35.9	10.4	14.0	0.0	0.0	0.0
1991	334.2	99.1	29.7	36.8	5.8	12127.0	-7892.0	30.8	8.4	11.0	0.0	0.0	0.0
1992	313.7	102.1	26.2	46.1	4.8	12307.0	-8737.0	30.9	8.2	9.6	0.0	0.0	0.0
1993	303.0	105.3	32.9	35.7	5.5	11297.0	-8129.0	27.3	7.3	9.1	0.0	0.0	0.0
1994	386.9	108.5	37.8	24.7	6.5	9534.0	-6675.0	17.8	5.7	8.9	0.0	0.0	0.0
1995	604.5	111.7	41.2	16.8	7.9	10916.0	-7131.0	23.0	7.0	9.7	0.0	0.0	0.0
Rwanda													
1990	321.2	7.2	40.6	0.3	13.2	102.6	-227.7	11.3	9.9	16.6	1.0	0.0	0.0
1991	266.7	7.2	31.5	0.3	13.3	95.6	-228.1	12.6	10.9	13.3	1.0	0.0	0.0
1992	276.9	7.4	31.6	0.1	12.1	68.5	-241.1	10.1	8.9	13.0	1.0	1.0	0.0
1993	261.0	7.5	32.8	0.1	11.5	67.7	-267.7	9.1	8.4	12.5	1.0	1.0	0.0
1994	96.8	7.7	40.0	0.0	14.0	32.2	-367.1	3.5	3.5	5.9	1.0	0.0	0.0
1995	157.1	7.9	35.0	0.0	14.3	51.2	-237.3	7.1	6.6	10.2	1.0	0.0	0.0
Sao Tomé and Príncipe													
1990	575.6	0.1	28.2	--	5.3	4.4	-21.3	15.6	9.4	13.0	1.0	0.0	0.0
1991	568.9	0.1	27.6	--	6.0	6.0	-24.5	16.2	10.2	14.1	1.0	0.0	0.0
1992	453.3	0.1	26.4	--	6.4	5.4	-22.5	20.2	13.4	18.2	1.0	0.0	0.0
1993	476.2	0.1	28.9	--	6.5	6.6	-25.5	18.0	13.0	18.3	1.0	1.0	0.0
1994	495.4	0.1	25.5	--	5.4	6.5	-24.3	13.3	10.0	13.4	1.0	1.0	0.0
1995	454.9	0.1	26.4	--	5.2	5.1	-23.5	16.5	9.8	13.3	1.0	0.0	0.0
Senegal													
1990	781.2	7.3	19.9	0.5	13.1	893.6	-1164.3	19.4	15.6	19.4	1.0	1.0	1.0
1991	732.5	7.5	19.5	0.5	13.6	824.2	-1114.1	19.4	16.7	21.2	1.0	1.0	1.0
1992	791.3	7.7	20.0	0.4	13.3	828.1	-1199.9	18.2	15.3	19.1	1.0	0.0	1.0
1993	708.4	7.9	20.1	0.4	13.5	718.7	-1101.5	16.1	13.9	17.4	1.0	0.0	1.0
1994	477.4	8.1	17.2	--	13.9	793.8	-1026.6	14.0	12.4	15.0	1.0	1.0	1.0
1995	582.3	8.3	--	--	--	968.6	-1216.9	15.1	13.6	--	1.0	1.0	1.0

Table 8. Sub-Saharan African Countries: Selected Economic Indicators, 1990-95 1/ (continued)

	GDP Per Capita (In U.S. dollars)	Population (In millions)	Agriculture (In percent of GDP)	Mining (In percent of GDP)	Manufacturing (In percent of GDP)	Goods Exports: f.o.b (In millions of U.S. dollars)	Goods Imports: f.o.b (In millions of U.S. dollars)	Total Revenue (In percent of GDP)	Tax Revenue (In percent of GDP)	Tax Revenue (In percent of Nonagriculture GDP)	SPA Countries *	Country with Fund-supported Program	CFA Franc Zone and Non-CFA Franc Zone Countries *
Seychelles													
1990	5,265.5	0.1	3.3	--	9.1	57.1	-166.4	47.7	38.3	39.6	0.0	0.0	0.0
1991	5,348.0	0.1	3.2	--	9.7	49.3	-162.8	44.2	34.3	35.4	0.0	0.0	0.0
1992	6,195.1	0.1	2.3	--	10.9	48.1	-180.5	44.5	34.5	35.3	0.0	0.0	0.0
1993	6,669.8	0.1	2.3	--	9.9	51.3	-216.3	45.2	36.6	37.4	0.0	0.0	0.0
1994	6,966.2	0.1	2.7	--	10.6	52.1	-188.6	44.4	34.1	35.0	0.0	0.0	0.0
1995	7,517.3	0.1	3.5	--	11.4	55.5	-218.3	40.0	28.9	30.0	0.0	0.0	0.0
Sierra Leone													
1990	148.6	4.0	45.5	11.2	6.4	145.2	-154.8	10.2	9.6	17.5	1.0	0.0	0.0
1991	150.4	4.1	43.2	10.5	8.7	144.8	-158.3	12.0	11.6	20.5	1.0	0.0	0.0
1992	141.1	4.2	40.6	8.3	10.4	149.6	-154.7	13.8	13.3	22.4	1.0	1.0	0.0
1993	161.9	4.3	41.0	7.1	10.7	118.0	-148.0	14.0	13.6	23.0	1.0	1.0	0.0
1994	186.0	4.4	38.9	16.8	8.7	117.9	-149.2	10.5	10.1	16.6	1.0	1.0	0.0
1995	172.3	4.5	--	--	--	42.1	-137.1	9.4	9.2	--	1.0	1.0	0.0
South Africa													
1990	2,578.6	37.1	5.3	9.7	25.5	23560.3	-16777.6	25.7	24.8	30.1	0.0	0.0	0.0
1991	2,650.0	38.0	5.1	9.2	24.9	23289.2	-17163.0	24.6	23.8	28.9	0.0	0.0	0.0
1992	2,791.7	38.8	4.2	8.6	24.0	23624.0	-18194.0	24.1	23.2	27.2	0.0	0.0	0.0
1993	2,670.6	39.6	4.5	8.8	23.5	24104.0	-18327.0	24.9	23.9	28.5	0.0	0.0	0.0
1994	2,681.8	40.4	5.1	8.6	23.4	24678.0	-21481.0	25.2	24.7	30.2	0.0	0.0	0.0
1995	2,880.5	41.2	4.4	7.8	24.3	27886.0	-27142.0	25.7	24.9	30.2	0.0	0.0	0.0
Sudan													
1990	376.7	25.7	28.7	0.1	9.4	326.5	-648.8	8.1	5.1	7.3	0.0	0.0	0.0
1991	218.8	26.5	33.9	0.1	9.6	302.5	-1138.2	8.3	5.6	8.8	0.0	0.0	0.0
1992	187.2	27.3	35.1	0.2	9.7	213.4	-810.2	9.5	6.9	11.0	0.0	0.0	0.0
1993	247.7	28.1	35.8	0.2	9.2	306.3	-532.8	7.9	6.3	10.2	0.0	0.0	0.0
1994	216.1	28.9	38.9	0.2	8.0	523.9	-1045.4	9.3	6.9	11.9	0.0	0.0	0.0
1995	212.3	28.1	40.7	1.1	7.9	555.7	-1066.0	8.7	6.9	9.5	0.0	0.0	0.0
Swaziland													
1990	1,074.7	0.8	10.2	1.8	29.1	550.3	-588.9	33.5	30.1	34.9	0.0	0.0	0.0
1991	1,076.0	0.8	11.3	0.9	29.6	593.8	-635.0	32.8	30.0	34.7	0.0	0.0	0.0
1992	1,132.5	0.8	9.0	1.6	28.5	639.0	-767.2	31.3	28.0	31.8	0.0	0.0	0.0
1993	1,121.0	0.8	11.1	1.5	27.4	674.3	-773.6	29.5	28.0	32.8	0.0	0.0	0.0
1994	1,165.7	0.9	10.2	1.4	27.6	745.4	-818.7	30.3	29.2	33.8	0.0	0.0	0.0
1995	1,231.8	0.9	8.5	1.1	26.3	798.3	-898.4	33.7	32.8	36.7	0.0	0.0	0.0
Tanzania													
1990	153.2	25.6	47.6	0.8	7.8	407.8	-1186.3	15.7	14.0	29.5	1.0	1.0	0.0
1991	160.1	26.4	51.9	1.3	7.1	363.0	-1229.9	16.8	14.8	34.4	1.0	1.0	0.0
1992	136.7	27.2	52.1	1.7	7.5	400.7	-1316.6	12.8	11.4	27.6	1.0	1.0	0.0
1993	127.6	28.0	50.4	1.3	7.2	444.6	-1288.6	14.8	13.5	30.7	1.0	0.0	0.0
1994	128.8	28.8	50.0	1.4	6.7	519.4	-1309.3	14.5	13.1	31.7	1.0	0.0	0.0
1995	136.9	30.3	50.7	1.2	6.0	682.9	-1340.4	15.0	12.8	32.6	1.0	0.0	0.0
Togo													
1990	464.4	3.5	33.6	4.9	9.9	395.2	-510.9	22.7	18.7	28.1	1.0	1.0	1.0
1991	445.1	3.6	32.8	5.9	11.1	393.1	-452.3	17.4	15.2	22.7	1.0	0.0	1.0
1992	431.5	3.8	36.4	4.0	10.9	305.5	-382.6	16.7	12.6	19.9	1.0	1.0	1.0
1993	310.2	3.9	45.0	3.9	8.7	215.1	-251.1	11.2	9.0	16.4	1.0	0.0	1.0
1994	231.0	4.0	33.3	5.5	9.5	226.0	-212.0	13.0	11.8	17.6	1.0	1.0	1.0
1995	316.0	4.1	32.0	5.0	9.9	346.2	-329.5	15.0	13.8	20.3	1.0	1.0	1.0

Table 8. Sub-Saharan African Countries: Selected Economic Indicators, 1990-95 1/ (concluded)

	GDP Per Capita (In U.S. dollars)	Population (In millions)	Agriculture	Mining	Manufacturing	Goods Exports: f.o.b	Goods Imports: f.o.b	Total Revenue	Tax Revenue	Tax Revenue (In percent of Nonagriculture GDP)	SPA Countries *	Country with Fund-supported Program	CFA Franc Zone and Non-CFA Franc Zone Countries *
			(In percent of GDP)			(In millions of U.S. dollars)		(In percent of GDP)					
Uganda													
1990	208.5	17.9	48.7	0.2	5.4	177.8	-491.0	7.4	7.2	14.1	1.0	1.0	0.0
1991	167.3	18.6	48.3	0.2	5.8	173.2	-377.1	6.8	6.3	12.2	1.0	1.0	0.0
1992	151.4	19.3	48.3	0.3	5.6	151.2	-421.9	7.3	6.7	12.9	1.0	1.0	0.0
1993	172.8	19.9	45.8	0.3	6.1	200.0	-441.7	8.3	7.8	14.3	1.0	0.0	0.0
1994	238.7	20.6	45.5	0.3	5.9	440.9	-672.2	10.0	9.2	16.9	1.0	1.0	0.0
1995	275.0	21.3	41.5	0.3	6.5	548.9	-866.7	10.3	9.7	16.6	1.0	1.0	0.0
Zaïre													
1990	262.9	35.6	30.1	12.0	11.0	2131.0	-1836.0	10.0	9.3	13.3	0.0	0.0	0.0
1991	247.8	36.7	41.3	6.1	7.3	1631.0	-1524.0	4.9	4.4	7.5	0.0	0.0	0.0
1992	205.5	39.9	49.0	4.6	4.9	1288.0	-885.0	3.1	2.7	5.4	0.0	0.0	0.0
1993	260.2	41.2	51.3	6.3	6.8	1144.0	-668.0	4.1	3.4	7.0	0.0	0.0	0.0
1994	124.0	42.5	57.6	4.7	5.4	1272.0	-629.0	3.3	2.9	6.9	0.0	0.0	0.0
1995	117.8	43.9	58.0	4.3	6.5	1451.0	-870.0	4.4	4.1	12.7	0.0	0.0	0.0
Zambia													
1990	463.7	8.1	18.2	9.0	31.9	1263.0	-1084.0	20.3	19.9	24.4	1.0	0.0	0.0
1991	401.5	8.4	15.8	8.4	33.3	1085.0	-952.0	18.7	18.3	21.7	1.0	0.0	0.0
1992	381.5	8.7	21.3	5.6	33.2	1111.0	-1302.0	18.4	17.5	22.3	1.0	1.0	0.0
1993	398.7	8.9	28.0	8.0	29.6	970.0	-950.0	14.3	13.9	19.6	1.0	1.0	0.0
1994	403.7	9.2	25.9	7.7	29.7	1066.0	-1003.0	18.1	16.8	22.7	1.0	1.0	0.0
1995	438.6	9.4	16.5	9.0	36.5	1190.0	-1278.0	16.9	15.5	18.6	1.0	0.0	0.0
Zimbabwe													
1990	725.0	9.4	13.8	4.8	22.3	1753.0	-1512.0	33.7	30.5	39.7	0.0	0.0	0.0
1991	597.8	10.2	14.2	5.1	22.9	1786.0	-1700.0	36.2	33.3	43.7	0.0	0.0	0.0
1992	521.4	10.5	11.3	5.0	21.9	1530.0	-1781.0	31.3	27.6	35.0	0.0	1.0	0.0
1993	516.2	10.8	16.4	5.0	19.6	1610.0	-1512.0	30.6	26.7	36.3	0.0	1.0	0.0
1994	521.8	11.1	17.0	5.5	21.6	1947.0	-1778.0	28.2	25.0	33.6	0.0	1.0	0.0
1995	572.5	11.5	13.0	5.8	17.6	2217.0	-2128.0	28.5	24.3	31.3	0.0	1.0	0.0

Sources: IMF, International Financial Statistics, country documents; World Economic Outlook; World Bank database; The World Bank Atlas 1994; and UNESCO statistical yearbook 1994.

1/ Excluding Liberia and Somalia.
2/ Federally collected for total revenue.
3/ Tax revenue data include petroleum profit tax, inland revenue, custom and excise and VAT; and excludes royalty and direct profit income from petroleum production.

* Note: 1 = Countries with Fund-supported program in place in July 1996.
0 = Countries with no Fund-supported program in place in July 1996.
1 = CFA franc zone countries.
0 = Non- CFA franc zone countries.

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