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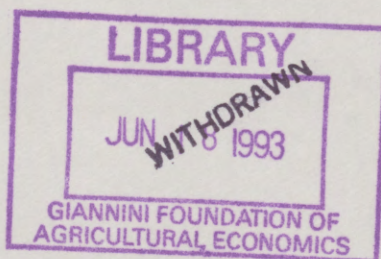
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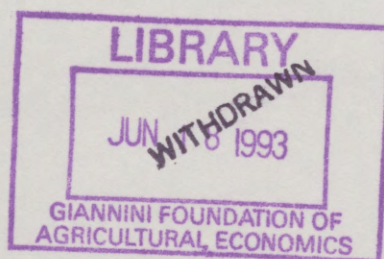


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*The Revenues and Expenditures of African Governments:
Modalities and Consequences*

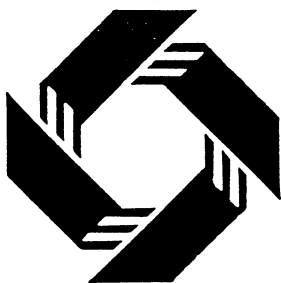
Mark Gersovitz* and Christina H. Paxson#



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*The Revenues and Expenditures of African Governments:
Modalities and Consequences*

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October 1992

This paper documents some dimensions of the economic behavior of African governments. It does so with the goal of trying to site the activities of these governments in the wider context of African economic performance as a whole. Like governments anywhere, African governments raise revenues, employ workers and make expenditures.

The structure of African economies, however, gives special characteristics to each of these activities. In particular, there are important interdependencies between revenues, employment and expenditures, and in more ways than the obvious one that expenditures have to be funded and require employees for implementation.

Among issues considered are: the dependence of government revenues on export prices; the unimportance of the personal income tax; the level of government wages relative to economic opportunities in the private sector; the role of education in altering the supply of government workers and their wages; the effect of government expenditures on government revenues, and the timing of these effects.

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Author's Acknowledgements

Mark Gersovitz thanks the Institute for Policy Reform for the support that led to the analysis reported in this paper. We would like to thank Shanta Davarajan and David Newbery for comments on an earlier version.

Executive Summary

Like governments anywhere, African governments raise revenues, employ workers and make expenditures. Only by doing so can these governments undertake important economic functions. As always in Africa, however, information is scarce and late, and the picture of these governments' activities is inevitably fragmentary.

In Africa, governments depend heavily on international trade for their revenues. While import and export taxes are important, they understate the true situation. First, the other important sources of revenue (taxes on business incomes and on sales) are themselves heavily dependent on export prices. Second, these governments depend on sources of revenue that are not included in the conventional accounts and that are themselves dependent on export prices. Third, the rules on how these revenues are raised often mean that revenues depend more than proportionately on export prices. Fourth, a high proportion of personal income taxes do not represent net additions to government resources because they fall on the government's own employees. Because export prices have been low recently, these governments find that their main revenue base is eroded.

African governments are extremely important as employers in the non-agricultural sectors of their economies, and therefore as employers of educated workers. The best available evidence suggests that African governments do not currently compensate their employees more than comparable workers in the private

sector. Public sector compensation has tended to fall relative to that in the private sector, and within the public sector the salary scale has tended to be compressed. Likely explanations for these developments are the increase in educated workers in these economies and problems in raising revenues by these governments, but no quantitative decomposition is available. For a number of reasons, the proportion of total expenditures made on wages and salaries is not a very good indicator of whether governments are inefficiently sacrificing expenditure on other inputs to preserve jobs. Data on the delivery of specific services that could be used to make such judgements are just not available on an Africa-wide basis.

Because governments have limited opportunities to raise revenues and are so important in the modern labor market, they must be concerned about the effects of their expenditures on their revenues and on the costs of implementing programs. The timing of these effects are also important. In planning educational policies, governments must take into account their effect on the supply of the type of worker that they hire and also the long lags between educational investments and increased productivity. In choosing among projects that affect the production activities of the private sector, governments must be concerned about whether their revenue base expands or contracts. Thus the question of road maintenance in Africa is one not only of aggregate production but also of keeping up the export activity that is often the mainstay of government revenues.

Table of Contents

Abstract	i
Executive Summary	ii
1. Introduction	1
2. Governments as Raisers of Revenue	2
A. Revenue Sources	2
B. The Trade Picture	8
C. Empirical Effect of Export Prices on Government Revenues	10
3. Governments as Employers	13
A. Basic Notions	13
B. Public-Private Wage Differentials	17
C. Evolution of Government Wages	21
D. Allocation of Expenditures between Wages and other Categories	24
4. Government as Provider of Goods and Services	26
A. Basic Notions	26
B. Road Maintenance	27
C. Expenditure on Education	29
5. Conclusions on the Activities of African Governments	34
References	38

1. Introduction

Like governments anywhere, African governments raise revenues, employ workers and make expenditures. Only by doing so can these governments undertake important economic functions. But under the economic circumstances that prevail in Africa, these decisions are conditioned in ways that differ from elsewhere.

We elaborate some of the interactions between these governments and their economies, and discuss how economic factors impinge on the decisions of these governments. In this way, we begin to site the activities of these governments in the wider context of African economic performance as a whole, a performance that is widely viewed as troublesome.

There would seem to be four very broad functions that governments undertake: (1) they raise revenues; (2) they make purchases and employ labor; (3) they provide services to the private economy; and (4) they intervene in the pricing of factors of production and products, and regulate economic activity in various ways. While all four types of activities affect incentives in the private economy, the first three have as their principal motivation the direct control of resources by the government. In succeeding sections, we restrict attention to the first three, focusing on the government as a producer rather than as a regulator.

These three categories of activities are not independent, however, and one of the important themes of this paper is to look

at the same topic from the three perspectives of government as raisers of revenue, as employers, and as providers of goods and services. For instance, government is a disproportionate employer of educated workers, and is the predominant determinant of the supply of these workers through its educational expenditures. What it spends on education therefore affects what it will later have to spend as employer. At the same time, the current size of its work force influences the wages received by educated workers relative to uneducated, and therefore the apparent returns to education. As another example, as a raiser of revenue, government has trouble imposing a personal income tax on workers other than salaried employees in large organizations. But government itself is by far the major employer of this kind of worker, so that the personal income tax is an ineffective instrument for raising revenue.

It is only possible to get a very partial picture of government activities in Africa, because data are scarce and when available at all are often much delayed. This situation is evident from the very many gaps in the following tables.

2. Governments as Raisers of Revenue

A. Revenue Sources

Governments need revenues if they are to undertake economic functions, including ones that promote economic growth, and in ways that only governments can. This section examines how African

governments get their revenues, and argues that these sources are narrow, dependent to a considerable extent on the prices these countries receive for their exports. The evidence for this conclusion is fragmentary and the situation prevails more for some countries than for others, but we believe that it represents an important consideration in thinking about the revenue prospects of many African governments.

Table 1 presents conventional measures of the shares of various revenue sources in the total revenues of African governments in 1985. Of 36 countries, 7 report that trade taxes account for more than 50% of total revenues, and an additional 13 report between 25% and 50% of total revenues from this source. By far the largest part of these revenues comes from import duties rather than levies on exports. To a first approximation, however, imports are financed by exports, and so both types of taxes depend equally on export prices.¹

This apparent dependence of government revenues on export prices is, however, likely to be an understatement of the true situation in many African countries. There are four reasons why we believe this situation prevails.

First, other important sources of revenue (taxes on business

¹Foreign aid and international borrowing provide other sources of foreign exchange, much of which comes under the direct control of governments in Africa. To the extent that foreign borrowing is repaid later on, the present value of exports will equal the present value of imports, even if trade does not balance at all times. The imports that correspond to government projects financed by foreign aid or international borrowing are often exempt from taxation in any case.

incomes and on sales of goods and services) themselves depend on export prices. In Africa, the tax authorities cannot directly reach small producers to tax their incomes, certainly those in the rural areas and those in the small-scale urban sector. Taxes on business incomes therefore fall primarily on fairly large companies, and these companies are most prominently involved in mineral and petroleum production, with incomes that depend heavily on export prices. They pay taxes on their profits (Table 1, col. 1) or they pay royalties and concession rents, in the category of nontax revenues (Table 1, col. 3). For instance, between 1978 and 1985, the Nigerian government received between 65 and 81% of its revenues from the petroleum sector, but none of this revenue was recorded as trade taxes (Gersovitz and Paxson, 1990, Box 3). Lack of data precludes a corresponding calculation for African countries as a group and over time.

Sales taxes apply to sales of both domestically produced goods and imported goods. In Africa, a disproportionate amount of the revenue from the sales tax comes from imported goods. This part of the sales tax is much easier for the authorities to administer and some goods that are disproportionately imported are taxed relatively highly in systems with differentiated rates.

Due (1987, p. 60) writes that half or more of total revenues from the sales tax usually come from imports. He gives the examples of: Cameroon (89%), Ivory Coast (47%), Kenya (55%), Madagascar (59%), Mauritania (60%), Senegal (36%), Uganda (60%), and Zambia (49%). By contrast, imports generally account for much

lower percentages of GDP (World Bank, 1989, Table 4): Cameroon (20%), Ivory Coast (28%), Kenya (26%), Madagascar (27%), Mauritania (57%), Senegal (35%), Uganda (17%), and Zambia (42%). Thus of this group, only Mauritania, Senegal and Zambia exhibit ratios of imports to GDP that are near, but still fall short of, the ratios of taxes raised from the sales of imports to total sales taxes. There are, however, no systematic data that would allow the corresponding calculation for African countries as a group and over time.

Second, these governments rely on sources of funds excluded from the conventional accounts and that themselves depend on export prices. The resources available to African governments include the surpluses of marketing boards that handle agricultural exports, sums that depend on export prices. These amounts, however, often do not appear in the governmental revenue accounts and if they do, they may not be classified as export taxes. Governments may borrow these funds or direct how they are to be spent or invested without claiming them as revenues as conventionally measured.

Third, the conventional trade-related revenues are raised under rules that often make them depend more than proportionately on export prices. This is not true of ad valorem export duties and import tariffs, but it is true of revenues from the profits of activity in the mineral sectors and from marketing boards for agricultural exports.

Many African governments get important revenues from mineral

and petroleum exports. They often own all or part of the enterprises that do the production and also tax their profits. These profits, however, change more than in proportion to export prices.

Zaire and Zambia are good examples of countries that have continued to earn export revenues from minerals but suffered collapses in export-related government revenues when export prices have fallen (Gersovitz and Paxson, 1990, p.45). For instance, in the two years 1970 and 1974, Zaire earned a total 15,519 million (real 1980) zaires from its copper exports, but in the four years 1975-78, it earned a total of only 7,761 million. The percentage of export earnings kept as government revenue declined from 61% to 44% between these two periods. In Zambia, government revenues from minerals fell from 30% of total copper export earnings in 1965-74 to 2% in 1975-82. The oil exporters, provide a similar picture.

In the case of agricultural exports, the policies of many governments operating through marketing boards result in a more than proportional response of their revenues to changes in export prices. By fixing prices to domestic producers, governments find that on the margin, they absorb the full impact of changes in international prices. These revenues therefore fluctuate more than in proportion to international prices. Evidence from Gersovitz and Paxson (1990) indicates that although many countries stabilize producer prices relative to world prices, some do not. Burkina Faso, Kenya, and Sierra Leone, for example,

allowed producer prices to fluctuate with world prices between the early 1960's and mid-1980's. Uganda and Ghana, by contrast, have experienced periods when producer prices were continuously reduced despite increases in world prices.

Fourth, a high proportion of personal income taxes do not represent net additions to government resources. In Africa, the tax authorities cannot tax most individual recipients of incomes. Instead, they only succeed in withholding and collecting taxes on the incomes of their own employees and the employees of larger private firms. Tanzi (1987, p. 225), for instance, shares this perception, basing it partially on the very high proportion of income taxes that derive from salaries and wages.

We know of no information on the proportion of taxes on personal incomes that comes from the incomes of public employees. Tabulations in Table 2 from a survey of Cote D'Ivoire indicate, however, that the fraction of public employees who have income tax withheld from their pay exceeds the fraction of private employees who have income tax withheld. For example, in the 1986 survey, 90.6% of public sector employees had income tax withheld, in contrast to 55.1% for private sector employees. Part of this difference is accounted for by the fact that public sector employees tend to have higher wages, and such workers have higher withholding rates. Even within wage quintiles, however, public sector withholding rates are higher than in the private sector. Without knowledge of the details of the tax code in Cote d'Ivoire, it is not possible to say whether the lower withholding

rates among private sector workers reflects tax evasion or less stringent withholding requirements. In either case, however, taxation of the incomes of government employees does not produce revenue that governments can use to increase the compensation of their employees.

B. The Trade Picture

All these factors suggest that there is likely to be a strong relationship between export prices and the revenues of African governments. As the preceding examples suggest, African countries depend predominantly on primary commodities for their export revenues: food products, agricultural raw materials, crude petroleum and minerals. Furthermore, each individual African country exports an extremely narrow range of primary commodities.

In 1982-84, for instance, 20 out of 33 African countries earned 50 percent or more of their total export revenues from just one primary commodity (Gersovitz and Paxson, Table 3), and nine of these earned 75 percent or more from just one commodity. All but four of the countries earned at least 50 percent of their export revenues from no more than three commodities. Three of the four exceptions (Kenya, Senegal and the Seychelles) produce and export refined petroleum products based on imported crude; these exports are really more in the nature of re-exports.

Many primary commodities are important for more than one of the countries. Cocoa, coffee, tea, sugar, groundnuts, cotton, animals and their products are significant agricultural exports

for three or more countries. Crude petroleum, copper, diamonds, and iron ore are each important for at least two countries.

Since independence, there has been no revolutionary continent-wide change in the reliance of African countries on primary commodities. Crude petroleum, however, has become of predominant importance to some of these countries, especially Angola, Cameroon, Congo, Gabon and Nigeria. Although there has been some increase in the processing of agricultural products, manufactured exports as a whole have not emerged to any noticeable extent. Not surprisingly, therefore, intra-African trade linkages are weak, and African countries export mainly to the world markets for primary commodities.

Table 3 provides information on the real value since 1950 of some international commodity prices that are of special importance to African countries. As is clear, these prices have been exceptionally low from 1986 to 1991, often less than half their average value over the period 1950-85. While evidence that these prices are declining systematically is weak, these prices do exhibit considerable intertemporal dependence, and some or even all of a shock may persist indefinitely. Thus, most of these prices will recover to their historical averages slowly if at all (Gersovitz and Paxson, 1990).

Based on the considerations discussed in section 2A, we expect that relatively low commodity prices mean particular difficulty for African governments in raising revenues, and there is no reason to believe based on the past behavior of these

prices that these pressures will abate in the near term. In the next section, we turn to some statistical evidence on the relationship between commodity prices and the revenues of African governments.

C. Empirical Effect of Export Prices on Government Revenues

All of these factors suggest that there is likely to be a strong relationship between export prices and the ratio of government revenues (R) to the GDP's (Y) of African countries. Let $R = tp_xX + R_0$ in which t is the proportional tax on exports (inclusive of any proportional tax on the imports that they finance), p_x is the price of exports and X is the quantity of exports and let $Y = p_xX + Y_0$. The elasticity of the ratio (R/Y) with respect to export prices is then the difference between the share of trade taxes in total revenue (tp_xX/R) and the share of exports in GDP (p_xX/Y). By contrast, if other sources of revenue also depend on export prices or if trade taxes are levied in ways that make them more than proportionately sensitive to export prices, the elasticity of total revenues with respect to export prices will exceed the difference of these shares.

Figure 1 plots the ratio of government revenue net of grants to GDP against the real price of exports for ten African countries.² These are all the African countries for which the

² The real price of exports is defined as the dollar unit value of exports divided by an international unit value index for manufactured exports to developing countries (as a general deflator).

International Monetary Fund (IMF) International Financial Statistics provides a reasonable number of observations on revenues between 1967 and 1989. For four of these ten (Burundi, Kenya, Tanzania and Zambia) there appears to be a fairly strong relation between the two variables. Note that this group of countries does not contain any oil exporters which presumably exhibit an extremely strong relation between the price of oil and government revenues.

This visual impression for the ten countries of Figure 1 is confirmed by ordinary least squares regressions of the logarithm of the ratio of revenues to GDP on the logarithm of real export prices and its one-period lag (to capture timing effects between export prices on a calendar year basis and fiscal years):

$$(1) \quad \ln(R/Y) = \alpha_0 + \alpha_1 \ln p_t + \alpha_2 \ln p_{t-1} + u_t$$

where R/Y is the ratio of the local currency value of total revenues net of grants to the local currency value of GDP and p is the dollar value of exports divided by an export quantity index and by a unit value index for manufactured exports to developing countries.³

Table 4, col. 4 reports the sum of the coefficients ($\alpha_1 +$

³ The regressions were estimated using data from 1969-89. The nominal value of revenue net of grants was from the IMF, International Financial Statistics Yearbook 1990. The unit value for manufactured exports to developing countries is from World Bank sources and is the MUV described in Gersovitz and Paxson (1990). All other variables are from the diskette corresponding to World Bank (1991).

α_2). For Kenya, Tanzania and Zambia, the elasticity of the revenue to GDP ratio is statistically significantly greater than the difference between the two shares (Table 4, col. 3) and indicates that these countries have more than proportional responsiveness of the revenue ratio to export prices. Zambia is a particularly good case. For an additional four countries (Burundi, Liberia, Sierra Leone and Zaire) the elasticity is at least as great as the difference in the shares, although not significantly so.

Three countries (Ethiopia, Ghana and Malawi) do not exhibit the expected sensitivity of the revenue ratio to export prices. Other factors help determine the ratio. In Ethiopia, the Marxist government that took power in the mid-1970's seems to have been successful in increasing the ratio over a number of years. In Ghana, general economic problems seem to have led to the collapse of revenues at a time when export prices were generally high, but with the changed economic policy in the mid-1980's, the relationship seems to have emerged.

These calculations do not incorporate trade-based funds at the disposal of governments that do not enter their revenue accounts nor does it net out revenues from the taxation of the incomes of the governments' own employees which we have argued are not economically relevant. For these reasons, the coefficients may still underestimate the responsiveness of government revenues to export prices. They do, of course, incorporate whatever short-term adjustments occur in the economy

as a whole in response to export price changes.

Finally, we note that these regressions are really only descriptive summaries of the very small amounts of data that are available, rather than structural estimates. Factors other than export prices help to determine the ratio. For one thing, African governments seem to have been intent on expanding the size of their activities relative to GDP in the first years after independence, but such increases could not go on indefinitely.

3. Governments as Employers

A. Basic Notions

Like governments anywhere, African governments decide on how many workers they employ, on what to pay their employees, and on other conditions of employment. Various programs of structural adjustment and other policies of economic change have put these decisions at center stage in Africa. For instance, Ghana has been reducing the number of its employees and increasing the wages of those that remain, particularly in the relatively highly paid and highly skilled categories (Kapur, et al, 1991). To the extent that currently low prices in international commodity markets mean fiscal problems, African governments may not be able to proceed as previously, even if they wish. This section sets out some of the economic considerations in these decisions and examines the evidence on what African governments have been doing.

Perhaps the most striking aspect of African governments as

employers is the relative importance of their employees in total non-agricultural employment. Table 5 gives some evidence from about ten years ago; we know of none later. Of 11 governments, 6 have a share of public sector employment in non-agricultural employment that exceeds 50%, while all but one exceed 25%. Four governments have shares that exceed 70%.

These high shares almost certainly imply even higher shares of the public sector in certain types of manpower, most especially among moderately to highly educated workers. Table 6 provides evidence consistent with this idea from Cote d'Ivoire, based on household surveys conducted in 1986, 1987 and 1988. Among workers between the ages of 25 and 55 who completed at least one grade at the junior high level, the fraction who worked for the public sector exceeded 50%. The rate of public sector employment among less well-educated workers was substantially lower.

Because these governments are so important in the labor markets from which they hire, the number of employees that they hire affects the wages that both they and private employers pay in these markets. This linkage in turn is one influence on how many employees these governments should want to hire. By cutting back on the size of their work force, they can use their market power to lower the wages that they pay, even while their wages remain comparable to what private employers pay for the same type of labor. A corollary is that the size of the government's labor force affects the returns to education as measured by differences

in the earnings of the educated and uneducated. Other things equal, a larger civil service raises the wages of the educated workers that governments employ relatively intensively.

Furthermore, this predominance of African governments in non-agricultural employment underlines the point made in section 2 that there cannot be much scope for raising revenues from the tax on personal incomes. An income tax works most easily when applied to salaried workers through withholding by their employers. It is this category of worker, however, that is predominantly employed by the government in Africa.

These governments therefore have essentially one policy instrument to hand, the number of workers that they choose to employ. This choice about employment in turn determines the net wage that these workers receive. The government can choose to provide this net wage as different combinations of gross wage and income tax withholding, but to a first approximation this second decision is not of significance.⁴

Of course, governments have the option of paying a higher wage than is necessary to hire a particular number of workers. In

⁴ There is the question of choosing a wage that provides the proper signal to different parts of the government for purposes of decentralization. This should be the take-home pay of the government employee plus the tax due on this income if the government is able to tax wage payments in the private sector, to equalize the marginal product of labor between the government and private sectors. Of course, this presupposes that government agencies and especially public enterprises actually remit what is withheld, something that many evade (Radian, 1980). If, however, the government cannot tax the incomes of employees in the private sector, the wage for decentralization purposes within the government is the after-tax income of its employees, and there is no point to collecting this tax.

this case, there will be an excess supply of workers from the private sector and the government will ration jobs. A wage differential in jobs for which rural workers are potential candidates may lead to migration into urban unemployment in the hope of obtaining such jobs, the mechanism posited by Harris and Todaro (1970).

By contrast, if governments pay less than the wage in the private sector the expectation is that they will lose workers.⁵ The exception arises if governments offer some compensating conditions of employment such as less arduous performance, the opportunity to undertake other activities without penalty for absenteeism, or opportunities for additional income through corruption. All of these adjustments to working conditions compromise the efficiency of the civil service, a concern expressed about the current situation in Africa by Lindauer et al (1988) and Robinson (1990a and b), among others.

In conclusion, therefore, the equality of wages between the government and private sectors for equivalent workers is a necessary but not sufficient condition for the government to be pursuing a desirable employment policy. Because it is so large in some labor markets, the government must also take into account the effect of the size of its work force on the wage structure as

⁵For this reason we seem to be at odds with Knight and Sabot's (1990, p.149) discussion of the Tanzanian case. They write: "... the public sector was large enough to pursue an independent pay policy for many occupations without fear of losing workers to the private sector. We hypothesize, therefore, that in 1980 pay in the public sector was less dispersed and was lower for the better paid than in the private sector."

a whole. This is so because the government depends on general revenues that incur deadweight loss and therefore it is not desirable for it to mimic a price taker in its labor market if, in fact, it has market power.

B. Public-Private Wage Differentials

What is the evidence on how African governments compensate their employees relative to the private sector? As implied in the preceding section, this question can be asked in two variants, a narrow one and a broad one: How are government employees compensated relative to equivalent workers in the private sector? How are the types of workers that governments employ relatively intensively compensated relative to other types of workers in the economy?

Table 5, col. 4 provides information from about a decade ago on the ratio of the average central government wage to the per capita incomes in a number of countries. To give a better idea of relative compensations in employment, per capita incomes should be adjusted for the proportion of the population that is economically active. This is a difficult adjustment in highly agricultural economies, but might mean multiplying the ratio of col. 4 by a half or a third. Even adjusted in this crude way, most are very considerable multiples of per capita incomes. This provides an answer to the broad question and a reference point as various refinements are made to the comparison group to answer the narrow question, and we leave it aside until the next

section.

In manufacturing the work force is likely more comparable with the civil service than is the general population. In this case, the ratio of the two compensations is much reduced, and in some cases wages in manufacturing exceed wages in government. One qualification to this last comparison is that the public sector is often in charge of a large proportion of manufacturing activity in Africa through its public corporations. Manufacturing wages therefore contain a large element of public wages.

These comparisons to GDP per capita or the wage in manufacturing are, however, very crude from the viewpoint of finding a group of identical workers in the private economy. Comparisons between the compensation received by more closely equivalent groups of workers tend to produce lower estimates of the compensation received by civil servants relative to private employees.

For instance, Robinson (1990b, Table 9.C) provides more specific comparisons for such categories of employee as messenger and stenographer for twelve African countries observed at a time that he does not identify. His information does not seem to have been acquired in a statistically systematic way and may not be representative of even the particular job categories that he discusses. The general pattern from his evidence is that the civil service pays less than the private sector, in some cases less than half private rates, although there are exceptions in which the civil service pays more. Bennell (1981) and Lindauer

et al (1988, Table 6) present a similar general picture.

One problem with these types of comparisons arises if one or the other sector systematically hires workers with different characteristics into jobs that are given the same name. It is therefore of interest to know more about the characteristics of workers in each sector.

Lindauer and Sabot (1983) for Tanzania in 1971, Van der Gaag and Vijverberg (1988) and van der Gaag et al (1989) for Cote d'Ivoire in 1985 provide comparisons between compensation in the private and public sectors based on surveys with information on worker characteristics. In both surveys, the raw comparison of earnings favors the public sector. In Tanzania, monthly earnings exclusive of benefits are 51% higher for government employees and 56% higher for parastatal employees relative to the private sector. In the Cote d'Ivoire, average hourly wages inclusive of most benefits in the public sector are twice that in the private sector.

The characteristics of private and public employees are, however, quite different. In both surveys, public employees are much more educated, with almost twice the years of schooling in the Cote d'Ivoire. Public sector workers are also two to three years older on average than those in the private sector. The two groups of workers have almost identical years of job experience. Of potential importance, however, is that much more experience is occupation-specific in the public sector (approximately 6 years versus 4 in Tanzania, and 11 versus 7.5 in Cote d'Ivoire).

Both studies use the method of ordinary least squares to estimate the relation between wages in each sector and variables such as education, experience and sex. In the Tanzanian study, controlling for the different composition of the different work forces in this way reduces the wage premium between government workers and the private sector from 51% to 7%, although that between parastatal workers and the private sector falls less, from 56% to 19%. Correcting only for the occupational mix (analogous to Robinson's stenographers and messengers) lowers the gap from 51% to 16% in the former case, not a complete correction, but most of the way. The (OLS) results for the Cote d'Ivoire are less easily interpreted in this way, but private wages are still lower than public wages (van der Gaag et al, 1989, Figure 1).

Van der Gaag et al (1989) argue, however, that beyond correcting for observable worker characteristics, one should also correct for the tendency of workers to choose the sector of their employment based on unobservable characteristics. One example that they give (p.76-7) is if "... a preference for risk taking and entrepreneurship may make it more likely that an individual chooses a career in the private sector. Such an individual may also be more successful than the average private employee." In this particular instance, one would want to recognize that self-selection is producing a pool of private sector workers that are more able than the pool of public sector workers, and develop some method for correcting the wage differential to reflect this

situation.

When the results for Cote d'Ivoire are corrected for the tendency of workers to select into the sector where they do best, public wage offers are lower than private wage offers for a worker with average characteristics. Each worker has, however, apparently chosen the sector which pays the most for the particular worker's characteristics.⁶ Van der Gaag et al also provide evidence that there is more moonlighting by public than private employers (9.9% of the former versus 4.6% of the latter have second jobs). Nonetheless, second jobs do not per se imply bad performance on the main job; taking a second job might signal that a worker is innately more driven and less oriented to leisure and slacking.

C. Evolution of Government Wages

In this section we return to the broad comparison between the compensation of the workers that African governments hire relatively intensively and other types of workers in the private economy. Average real wages in African civil services have been declining in this sense. The decline is such that the ratios

⁶There is, however, the methodological problem that it is very hard to find variables that enter the selection equation but not the wage equations. Without such variables, the model is only identified by the functional form of the error terms, about which little is known. Van der Gaag et al discuss this problem, but cannot convincingly solve it. Krueger (1988) discusses how to use either longitudinal information or information on job applications to make inferences about the relative conditions of public and private employment, but such methods have not been applied to African countries.

between these wages and per capita GNP have fallen very sharply, often by much more than half (e.g. Sierra Leone, Sudan and Tanzania). Somalia is an extreme example, where Table 7 reports that real wages in 1985 were only 5% of real wages in 1975. And these changes are occurring even in those countries in which per capita GNP itself has fallen.

Table 7 provides a fairly dramatic statement of this tendency for both the lowest and highest basic salaries, with the one exception of Zimbabwe for the lowest basic salary. In only 3 of 14 countries did the two classes of salaries decline by the same percentage; in all other cases, the decline for the highest grade was sharper than for the lowest. There is thus compression in the compensation between the civil service and workers elsewhere broadly considered and within the civil service between the educated workers that governments employ relatively intensively and other categories that are more abundantly represented in the rest of the economy.

Ideally, it would be desirable to decompose the compression between government wages and the rest of the economy into what is occurring within narrowly defined employee groups and across these groups. Such an analysis would benefit from a time series of calculations of the sort done by Lindauer and Sabot and Van der Gaag et al for many African countries, but such information is impossible to obtain.

What can explain the observed compression? There have been important developments in both the demand for and the supply of

the types of workers that these governments employ.

On the demand side, African governments replaced the expatriate civil servants that they inherited at independence. These programs of Africanization made heavy demands on the very limited pool of educated Africans that existed at independence and thereby supported relatively high wages for these employees.

At the same time, these governments began to expand the educational system. After some delay, the result was an increase in educated workers and downward pressure on their wages. Barro and Lee (1992) estimate that the average years of schooling of the labor force in African countries has doubled, tripled and even quadrupled between 1960 and 1985. Collier and Bigsten (1981), Bigsten (1984), Collier and Lal (1986) and Knight and Sabot (1990) discuss the experience in East Africa.

Since the mid-1980's, the importance of demand factors may be re-emerging in the form of low international commodity prices if, as argued in section 2, there are associated difficulties in raising government revenues. In turn, fiscal difficulties may result in governments' lowering their employees' wages. To the extent that the compression is accompanied by decline in the size of the civil service, and some has been taking place (Collier, 1987), the shift in the demand by governments may result in a relative decline in the wages of the kinds of workers that they employ. Finally, compression in wages may reflect the loss of rents by civil service employees, to the extent that governments were earlier paying wages above those paid in the private sector

and rationing access and later ceased to do so. These changes could in turn be traced to the decline in government revenues.

D. Allocation of Expenditures between Wages and other Categories

A final important aspect of government as employer is the proportion of its total revenues that it spends on wages and salaries. This allocation raises the issue of the efficient combination of inputs to produce the goods and services that governments supply. For instance, Van Ginneken (1990) and others have expressed fears that governments that protect their workers during austerity may do so by cutting variable inputs to production in such sectors as education or health. There would then be fewer teaching materials relative to the number and compensation of teachers and similarly with respect to medicines and health workers.

We do not, however, have any systematic information on this question. Ogbu and Gallagher (1992) provide some limited information on the situation in the health sector of five African countries. Among the points that they make are: that the expenditure on drugs as a fraction of total recurrent costs has not generally been declining, that it is important to measure the extent of public provision in terms of physical measures of services delivered rather than expenditure, and that private provision in this sector can be growing while public provision is stagnating.

The share of wages and salaries in total government

expenditure is quite variable (Table 8, cols. 1 - 3). While this proportion seems to cluster in the range between a quarter and a third in most African countries, there are some notable outliers in both directions. Thus the Central African Republic spends more than one-half on wages and salaries, while Nigeria spends less than a tenth in recent years.

Part of this variation is associated with the activities on which governments spend their revenues, because different types of activities involve governments in more or less expenditure on their own employees. Information on the salary-intensity of different activities is not generally available, but Table 8 col. 5 gives information for some countries on the proportion of recurrent expenditure on primary education that is spent on teacher compensation. This is an extreme example, in which 12 of 15 countries spend 90% (or just under) on compensation. As can be seen from Table 8, col. 4 the proportion of total expenditure devoted to all forms of educational expenditure is itself fairly variable, so that differences in the proportion of wages and salaries in expenditures as whole partially reflect the composition of expenditures. At the other extreme to primary schooling in the importance of wage expenditure in total expenditures is probably capital expenditures.

Of the countries for which Table 7 provides data on the evolution of wages and for which Table 8 provides information on the evolution of the share of wages in government expenditure between 1975-79 and 1986, 7 countries had declining shares of

wages in expenditure and 4 had increasing shares. This situation contrasts with the 13 countries reporting data in Table 8 but not in Table 7, for which the share of wages fell in 7 cases and rose in 6, so perhaps the wages of government employees have done better in some of the countries that are not included in Table 7. It would seem useful to provide an arithmetic decomposition of the ratio of wages to GNP per capita as the product of the share of government expenditure in GNP, the share of revenue in expenditure, the share of wage payments in government revenues, and the reciprocal of the ratio of the level of government employment to the population, but we do not have the data to do so.

4. Government as Provider of Goods and Services

A. Basic Notions

An assessment of government provision of goods and services requires attention to the technical attributes of programs and projects and to the economically efficient combination of inputs to produce outputs, just as with any other organization. In addition, one needs to identify activities that the private sector will not provide, such as public-access roads. Consideration can then be given to whether production should be organized directly by the government or purchased by the government from private producers. While these principles are evident, their elaboration requires a detailed focus on sectoral

specifics.

Implicit in the discussion of sections 2 and 3, however, are some further general principles, and it is these that we use to pick two categories of government expenditure for further attention. Section 2 suggests that at least some African governments have a narrow revenue base in the international trade of their economies. Consequently, these governments must give attention to how their expenditures affect their revenues from international trade. Projects that support the export activities of their economies are consequently especially desirable, and we therefore look at investment in interurban roads. Section 3 suggests that these governments can affect the wages that they pay their employees through their own expenditures on education, and we therefore look at some trends in educational expenditures.

Sahn (1992) provides general background on basic trends in government expenditures in Sub-Saharan Africa. On average, real government expenditures as a whole in per capita terms have declined only slightly during the 1980's. Net of interest payments, however, government expenditures per capita have declined fairly steadily during the 1980's, reaching about 80% of their 1980 value by the end of the decade.

B. Road Maintenance

Rural roads are essential to the production of export crops in Africa. Although there are problems in evaluating precisely the costs and benefits of rural roads, there is a good deal of

information on both the technology of road construction and maintenance and the corresponding economics. In these senses, decisions on roads contrast with those on technological change for African agriculture, for which there seem to be basic uncertainties about what is feasible.

Some observers speak of a crisis of road maintenance in Africa. Anecdotal evidence suggests instances of extreme deterioration in the road network in Africa. Systematic (although still subjective) information on the quality of the road network is provided in Gaviria et al (1989), the Sub-Saharan Africa Transport Program (SSATP, 1992) and the World Bank (1988). For instance, in Africa as a whole, 47% of the main paved network is rated in good condition, 27% in fair and 26% as poor (SSATP, 1992, p. 15). This situation represents some deterioration from that in 1984.

While this status may not seem troublesome, a large part of this road network is relatively new and therefore by 1988 had not entered the phase at which rapid deterioration occurs without considerable maintenance effort (World Bank, 1988). The status of the unpaved network, which does not benefit from this delay, is much worse: only 29% is rated good, 32% fair and 39% poor, indicating that these countries are not undertaking adequate maintenance where the road system is currently vulnerable.

Expenditure on the road network in Africa is not small, averaging from 1986 to 1988 \$1.54 billion in 1988 prices or 1.1% of GNP (SSATP, 1992, p.18), and a correspondingly higher

proportion of government revenues. Maintenance expenditures are smaller, but equal or exceed 1% of GNP for 8 of 20 countries. The Bank estimates that \$1.15 billion in 1988 prices per year from 1989 to 2000 would be necessary to restore the economically justified parts of networks to good condition by the end of this period. This sum presupposes that a significant part of the network is allowed to deteriorate further, a loss relative to the current situation in which these roads assist in economic activity even if their renewal is not justified. Furthermore, these sums do not include any funds for increasing the network.

If, by contrast, only routine maintenance is carried out, at a cost of \$0.222 billion, 78% of paved roads would be in poor condition in East Africa and 91% in West Africa by the year 2000, and no unpaved roads would be in good condition. The total discounted savings from 1988 to 2000 in vehicle operating costs alone of restoring the economically justified network to good condition rather than following this minimal strategy is estimated at \$3.1 billion (SSATP, 1992, p. 30).

In the case of rural roads, therefore, the expenses are large relative to total government revenues, the potential losses will be realized soon if these expenses are not made, and without them all sorts of export activities will be impeded, with a consequent erosion in government revenues.

C. Expenditure on Education

Of 22 African countries in Table 9, 14 report that their

real expenditure on education in 1987 was below their expenditure for 1980, while the remaining 8 report the reverse. Among the former group is Nigeria which reports a decrease to 1.6 real 1987 US dollars from 3.4 real 1987 US dollars, a rather precipitous slide.

These figures on real expenditure are based, however, on an economy-wide deflator. What happens in the educational sector is best measured by the addition to quality-adjusted years of schooling. This quantity, in turn, is determined by the number of children that are in school and the quantity and quality of the inputs to education, teachers, teaching materials and classrooms.

Of 28 countries that report data in Table 9 on the primary school gross enrollment ratio, 17 report a rise in this ratio from 1980 to 1988, and only 11 report a fall in this ratio. Of course, an increase in the gross enrollment ratio is not an unambiguous indicator of improvement in education because it includes repeaters and students who begin late. This problem is highlighted by countries that report gross enrollment rates over 100, and a country such as Kenya in which the rate has fallen from over 100 with the possible interpretation that a problem has been solved. Data on net enrollment ratios are not, however, easily available.

Of 23 African countries that report data on the number of pupils per primary school teachers, only 10 report a fall in this ratio from 1980 to 1988, while 11 report a rise in it. Thus there is little overall indication of a change in the quality of

education in this dimension in these countries.⁷

The reason the picture should look brighter when one looks at enrollments and teacher-pupil ratios rather than real per capita expenditure is that teacher salaries have generally been falling along with those of other government employees (Zymelman, 1989, Table 9). Schultz (1987, Figure 1) suggests that this process has been occurring in Africa since the 1960's, well before the onset of Africa's problems with its export prices could have affected government revenues.

Nigeria, which is not included in either of these two last groups of reporting countries may well be doing very badly in all dimensions. For instance, between 1980 and 1985 its total number of primary school teachers dropped from 369,636 to 292,821, while its gross enrollment rate fell from 97% to 62% between 1980 and 1988. The Nigerian experience is much more difficult to reconcile with the notion that increased supply of teachers has pushed down their relative salaries, and is consistent with revenue problems consequent on the fall in the real price of petroleum.

How do decisions on educational strategies fit with considerations of revenue raising and government employment? One aspect of the interaction between educational policies and government employment has already been mentioned in the special case of teachers' salaries. Not only is government the employer

⁷ For the 13 countries in Table 9 that report information on all the variables, 7 report a fall in real per capita expenditure on education, 9 report a rise in the gross enrollment rate, and 7 report a fall in the pupil teacher ratio (with one tie).

of teachers, but its own educational policies also determine the future supply of teachers. More broadly, government is a very large employer of educated manpower as a whole in Africa, and its educational policies affect the supply of these employees. These governments must therefore consider the impact of their educational policies on the future availability of their own potential employees. Policies that expand the stock of educated workers may reduce the compensation that must be paid to educated workers in the future, lowering the cost of skill-intensive government programs later on.

A particularly important corollary is that these governments cannot be guided in their educational policies solely by the rate of return to education as conventionally calculated from comparisons of the earnings of workers with different levels of education. Furthermore, without more information about how a government's wage and employment policies affect the earnings of educated workers, it is not possible to determine whether the returns to education will be overstated or understated. One possibility is that because governments are large employers of educated labor, they can use their market power to keep the wages of these workers relatively low. In this case, the social rate of return to education may be higher than what the current earnings of educated workers would suggest.

Another possibility is that public sector employment of educated workers may be too large, and the government has bid up the market wages of these workers too much. In this case, the

returns to education will be artificially raised. This will be true even if all workers of the same education level are paid equally in the private and public sectors. It is also possible that some governments pay their educated workers wages that are higher than those prevailing in the private sector, and in this case it would be especially inappropriate to use the earnings of government employees to compute returns to education. The evidence in Section 2 suggests, however, that government workers are not paid more than comparable private sector workers, at least in the few countries for which there is evidence, and this last situation may not be of great importance.

It should be emphasized that African governments have called into being very large changes in educated manpower. Data on mean years of schooling in Africa are scarce, but Psacharopoulos and Arriagada (1986 and 1992 especially Table 2) do present some information. Mean years of schooling increased by 110% in Botswana between 1971 and 1984, by 66% in Zambia between 1963 and 1969 and by 60% in Nigeria between 1963 and 1967, although in the latter case from a very low base. Lee and Barro present a similar picture based on their estimates for a larger group of African countries. Changes of these orders of magnitude suggest the potential for very large changes in the returns to education, and that is what section 3.C suggests may have been happening.

Large increases in mean years of education of the labor force take time to produce. Children may not enter the labor force, at least as conventionally defined, for some years after

receiving limited elementary schooling. Furthermore, large increases in mean years of education that are achieved in a relatively short time imply great dispersion in educational attainment by age. Older workers are unlikely to participate in increased educational opportunities, but it is these mature members of the labor force who are experienced. Thus, if there is low substitutability between those workers with both education and experience and other workers, there may be considerable difficulties in realizing the full benefits of educational investments until the first generation with formal education has matured. Even then, their skills may have been stunted early in their careers by the lack of opportunity to learn from experienced workers.

5. Conclusions on the Activities of African Governments

Taken together, sections 2 to 4 suggest some ways to interpret the economic role of governments in Africa. This analysis contributes to understanding the sources of the poor economic performance of many African economies, where per capita incomes have declined since independence or risen only very slowly. On the one hand, we suggest that African governments are likely to be experiencing difficulties in raising revenue in a period of low international commodity prices. On the other hand, we see declines in the compensation of civil servants as reflecting not only any revenue problems, but also the benefits

of a relative increase in educated manpower that has been occurring since independence.

A major focus of the paper has been the interdependence of revenues, employment, and expenditures. This interdependence arises in more ways than the obvious one that expenditures have to be funded and require employees for implementation.

First, the sources of revenues available to many African governments are likely to depend importantly on the international prices of African exports. Because African governments are the main employers of salaried workers in their economies, the tax base is unlikely to include an economically meaningful personal income tax, either at present or in the near future.

Second, African governments do not appear to pay their employees more than comparable workers in the private sector, and may well be paying less. In the latter case, if these governments are holding onto their workers it likely reflects offsetting advantages of government employment, such as the toleration of absenteeism, that call into question the efficiency of government staffing. In making comparisons between public and private compensation, it is also important to adjust for the inability of government employees to evade withholding of personal income taxes from their earnings, while comparable workers elsewhere may have such possibilities.

Public sector wages appear to have been declining relative to private sector wages, and within the public sector, the salary scale has tended to be compressed. Compression of the skill

differential could reflect either (or both) a relative increase in educated workers consequent on past expenditures on education or a decrease in the funds available to governments to hire particular types of workers. Because these governments are such large employers that they presumably affect the wages earned in the economy as a whole by the types of workers they hire, they may still be paying too high wages if they are undertaking too high a level of expenditure and hiring too many workers. Excessive wages in this sense could still prevail even if workers in the public and private sectors earn the same amount.

Third, the expenditures of African governments feed back to affect their two other activities, the raising of revenue and the employment of labor. These introduce a set of super-sectoral issues in the sense that the desirability of different expenditures cannot be judged solely at the project level. For instance, government expenditures that promote exports expand the government's tax base. Policies that expand the production of crops that compete with exports may actually erode the revenue base. Educational policies that produce more potential government employees (such as teachers) lower the cost of implementing government expenditures, helping a given amount of funds to go further.

Different categories of expenditures not only have these effects on revenues and employee compensation to different degrees but also with different speed. Educational policies may take a long time before educated and experienced workers are

available. Road deterioration may choke off exports within a decade.

Sah and Stiglitz (1987) and Newbery (1992) present models with some of the elements needed to examine how these pieces fit together in a more formal way, models that we intend to adapt in future work.

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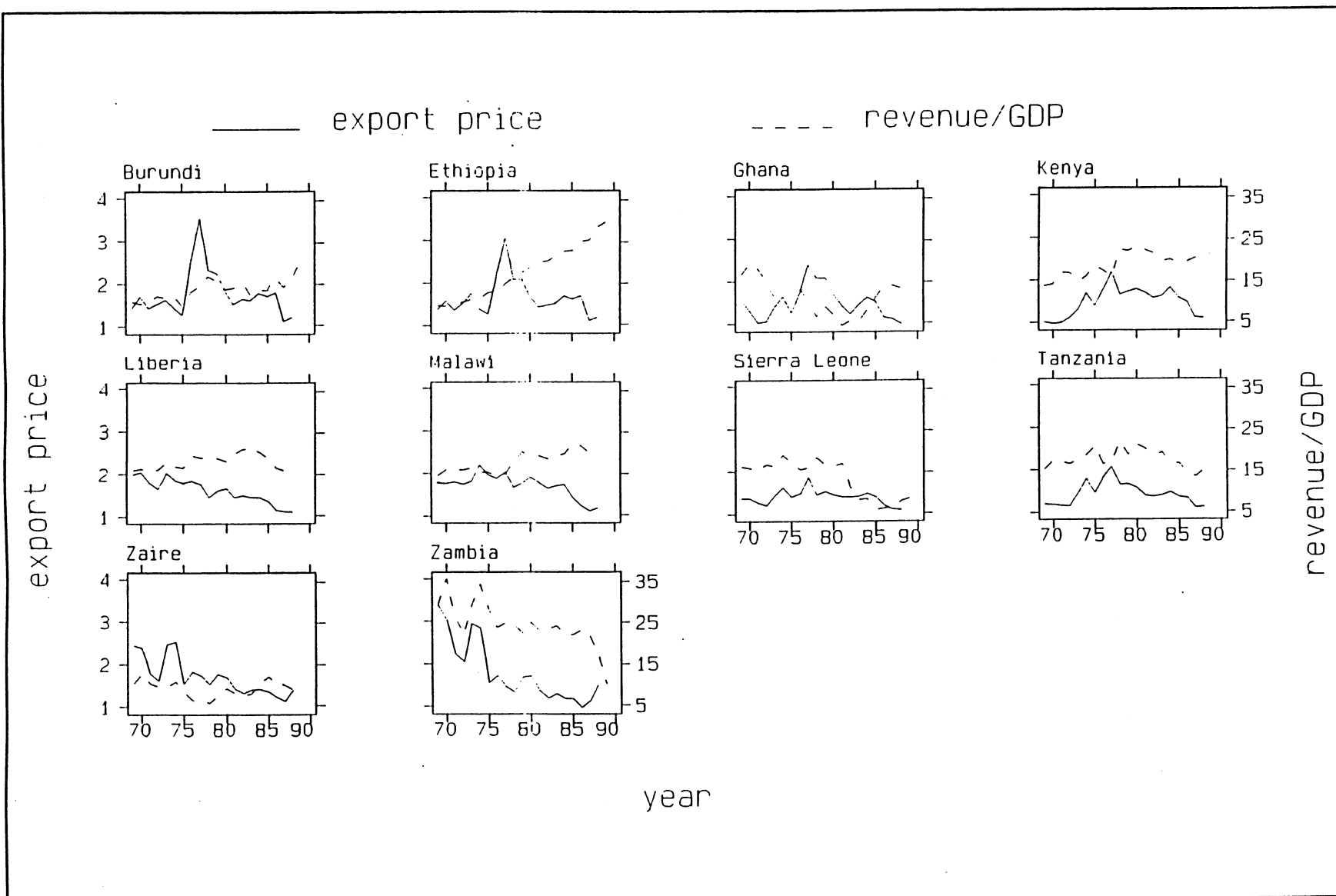


Figure 1: Export Prices and Revenue/GDP

Table 1
Sources of Revenue

<u>Country</u>	<u>(1)</u>	<u>(2)</u>	<u>(3)</u>	<u>(4)</u>
Benin	20.5	6.2	4.4	46.5
Botswana	29.7	0.9	55.0	13.9
Burkina Faso	12.4	13.8	26.1	33.8
Burundi	18.8	34.9	7.5	37.0
Cameroon	57.2	10.9	8.0	15.2
CAR	18.7	20.9	0.8	42.9
Chad	12.8	12.4	20.6	44.6
Congo	12.5	4.1	72.1	12.5
Cote d'Ivoire	8.9	20.9	31.3	30.5
Ethiopia	27.8	22.5	27.2	20.0
Gabon	44.9	6.6	31.7	16.5
Gambia	15.8	9.6	7.5	65.6
Ghana	20.0	23.1	14.0	42.6
Guinea	21.2	4.9	10.2	57.7
Guinea Bissau	14.5	13.9	33.5	40.9
Kenya	30.2	38.9	12.3	18.0
Lesotho	11.1	10.3	10.5	67.8
Liberia	38.1	27.2	0.9	28.3
Madagascar	12.4	23.1	2.0	39.2
Malawi	34.6	28.5	14.8	21.5
Mali	9.2	31.2	14.7	21.7
Mauritania	24.0	22.3	11.7	40.5
Niger	22.1	26.6	12.7	35.4
Nigeria	94.2	12.0	49.0	12.5
Rwanda	16.9	27.2	11.4	41.3
Senegal	21.5	28.5	6.8	38.7
Sierra Leone	26.8	23.9	5.1	38.6
Somalia	6.0	21.6	12.3	50.6
Sudan	20.2	10.8	13.2	53.6
Swaziland	25.5	6.6	8.4	58.8
Tanzania	25.6	55.7	5.6	8.4
Togo	33.1	8.2	22.4	29.1
Uganda	6.0	24.3	1.7	69.6
Zaire	26.8	19.2	14.4	37.3
Zambia	28.2	39.8	7.4	22.4
Zimbabwe	42.4	30.3	9.9	15.5

SOURCE: AEF Diskette.

Notes: Data are for 1985.

- (1) Taxes on income and profits, % total revenue.
- (2) Domestic taxes on goods and services, % total revenue.
- (3) Nontax revenues, % total revenue.
- (4) Taxes on international trade, % total revenue.

Table 2
Income Tax Withholding, Cote d'Ivoire

<u>1986 (N=525)</u>			
% with taxes with-held:			
Wage Quintile:	%private	private	public
1	85.7	22.2	33.3
2	53.3	50.0	87.8
3	47.6	80.0	94.6
4	29.5	90.3	94.6
5	27.6	86.2	97.4
Total	48.8	55.1	90.7

<u>1987 (N=570)</u>			
% with taxes with-held:			
Wage Quintile	%private	private	public
1	72.8	27.7	71.0
2	53.3	50.0	87.8
3	47.6	80.0	94.6
4	29.5	90.3	94.6
5	27.6	86.2	97.4
Total	48.8	55.1	90.7

<u>1988 (N=504)</u>			
% with taxes with-held:			
Wage Quintile	%private	private	public
1	79.2	7.5	66.7
2	62.4	63.5	94.7
3	52.5	84.9	93.8
4	40.6	92.7	100.0
5	40.0	97.5	98.3
Total	54.9	60.7	94.3

Notes: This table is based on data from the Cote d'Ivoire Living Standards Surveys of 1986, 1987 and 1988. These surveys were administered to unstratified random samples of the population. The samples selected for this table consist of all paid employees. The numbers in the table are based on answers to questions about each worker's main job. "N" indicates the total number of workers. "%private" refers to the number of private sector employees as a fraction of total employees. "% with taxes withheld" indicates the fraction of workers within each sector (public or private) who reported that taxes were withheld from their pay. The tabulations are displayed by wage quintile for the entire sample of public and private sector workers in each survey year.

Table 3
Descriptive Statistics: Real Commodity Prices

	<u>Average Real Commodity Prices</u>				<u>% Growth Rate</u>	
	1950-73	1974-79	1980-85	1986-91	Mean	Std.Dev.
bananas	1.14	0.80	0.85	0.78	-1.43	9.97
cocoa	0.98	1.54	0.98	0.53	-2.91	26.23
coffee	1.01	1.42	1.00	0.55	-4.03	23.98
sugar	0.99	1.64	0.88	0.53	-3.04	43.36
tea	1.27	0.79	0.71	0.43	-3.55	18.93
copra	1.19	1.09	0.79	0.38	-4.17	35.21
groundnut meal	1.19	0.96	0.77	0.50	-3.36	18.52
groundnut oil	1.10	1.25	0.82	0.51	-2.61	22.72
cotton	1.17	0.98	0.80	0.53	-3.19	17.78
logs	0.78	1.28	1.13	1.24	1.52	17.12
rubber	1.27	0.77	0.68	0.47	-4.23	21.90
sisal	1.10	1.18	0.80	0.60	-3.02	24.19
tobacco	1.11	0.97	0.96	0.62	-1.95	10.31
crude petroleum	0.44	1.49	2.53	1.22	1.26	23.88
copper	1.19	0.89	0.66	0.68	-0.67	21.19
iron ore	1.15	0.87	0.88	0.64	-1.11	11.20
manganese	1.21	0.82	0.65	0.69	-0.98	15.31
phosphates	0.99	1.42	0.96	0.65	-1.30	23.63
tin	0.88	1.36	1.31	0.39	0.93	13.44

Note: All prices run from 1950-91, except for logs (1956-87) and tin (1950-85 and 1990-91). Average real commodity prices were divided by the sample mean for the full 1950-91 time period (or the actual years for which data exist). Growth rates are measured as changes in the natural logarithm of real commodity prices. Because the tin price series is missing in 1986-89, the measure of the growth rate for the tin price is based only on data from 1950-85.

Table 4
Revenues Relative to GDP

<u>Country</u>	<u>(1)</u>	<u>(2)</u>	<u>(3)</u>	<u>(4)</u>	<u>(5)</u>
Burundi	0.37	0.11	0.26	0.29*	.8661
Ethiopia	0.20	0.12	0.08	-0.14	.6226
Ghana	0.43	0.13	0.30	-0.84*	.0186
Kenya	0.18	0.25	-0.07	0.34***	.0030
Liberia	0.28	0.43	-0.15	-0.15	.9772
Malawi	0.22	0.25	-0.03	-0.52***	.0060
Sierra Leone	0.37	0.11	0.26	1.76*	.1026
Tanzania	0.08	0.07	0.01	0.46**	.0133
Zaire	0.37	0.39	0.02	0.17	.5610
Zambia	0.22	0.39	-0.17	0.36***	.0001

- (1) Taxes on international trade as a fraction of total revenue. Source: see Table 1.
- (2) Exports as a fraction of GDP. Source: World Bank, World Development Report 1987, Table 5.
- (3) Column (1) minus column (2).
- (4) Regression estimates discussed in text, value of $\alpha_1 + \alpha_2$. Asterisks indicate whether $\alpha_1 + \alpha_2$ is significantly different from 0: "*" denotes at least 10% significance, "***" denotes at least 5%, and "****" at least 1%.
- (5) This column is the P-value from an F-test that column (4) minus column (3) is significantly different from 0. All regressions on which these F-tests were based had 17 observations, except for Liberia (16), and Sierra Leone (15).

Table 5
Government Employment and Wages Relative to the Private Sector

<u>Country</u>	<u>(1)</u>	<u>(2)</u>	<u>(3)</u>	<u>(4)</u>
Benin	43.05	86.95	.	9.81
Botswana	25.07	.	.	4.49
Burundi	.	.	2.84	15.11
Cameroon	8.46	.	2.38	7.39
CAR	.	29.90	2.38	5.60
Ghana	.	73.90	.	.
Kenya	28.95	39.05	0.95	4.44
Liberia	52.90	59.78	.	5.52
Malawi	.	39.20	.	.
Senegal	32.79	52.84	.	9.90
Swaziland	22.44	24.27	0.55	2.72
Tanzania	46.23	78.09	.	5.42
Togo	42.95	.	.	5.85
Uganda	.	42.20	.	3.90
Zambia	42.32	81.03	0.96	4.05
Zimbabwe	16.31	.	0.58	6.73

Source: Heller and Tait (1984), Table 22 for cols. 1 & 2, Table 28 for col. 3 and Table 27 for col. 4.

Notes: For various years between 1978 and 1982.

(1) Share of central government in non-agricultural employment.

(2) Share of public sector in non-agricultural employment.

(3) Ratio of central government avg. wage to manufacturing avg. wage.

(4) Ratio of central government avg. wage to per capita income.

Table 6
Public Sector Employment by Education Level
Cote d'Ivoire, 1986, 1987 and 1988

Education level (highest grade attained)						
Age:	<u>None/Kindergarten</u>		<u>Primary</u>		<u>Secondary/College</u>	
	<u>N</u>	<u>%govt</u>	<u>N</u>	<u>%govt</u>	<u>N</u>	<u>%govt</u>
15-19	1147	0.50	253	2.40	41	2.40
20-24	1068	2.10	151	2.60	70	14.3
25-34	2208	9.50	192	5.20	222	52.3
35-44	2081	9.50	92	10.90	97	59.8
45-54	1712	6.00	58	20.7	29	62.1
55+	1586	0.60	22	4.50	3	0
All	9802	5.60	768	5.60	462	43.9

Notes: This table is based on data from the Cote d'Ivoire Living Standards Surveys of 1986, 1987 and 1988. These surveys were administered to unstratified random samples of the population. The samples selected for this table consist of all individuals who worked for money (whether employees or self-employed) in the week before the survey. "N" is the sample size in the age/education cell. "%govt" is the percentage of observations who worked in the public sector in their primary job.

Table 7
Percent of Real Government Wages in 1985 to Those in 1975

<u>Country</u>	<u>(1)</u>	<u>(2)</u>	<u>(3)</u>
Benin	43.2	43.2	110.9
CAR	48.9	35.4	87.2
Ethiopia	62.6	31.3	87.4
Gambia	39.5	36.2	83.7
Kenya	58.2	42.0	106.1
Mauritania	60.6	43.8	90.9
Niger	46.2	46.2	84.0
Nigeria	42.2	21.9	78.4
Sierra Leone	23.4	15.7	85.3
Somalia	5.2	4.0	98.6
Sudan	30.3	24.6	89.4
Tanzania	22.9	18.8	82.1
Togo	58.1	58.1	86.4
Zimbabwe	150.6	58.1	90.2

Source: (1) & (2) Robinson (1990), Table 7-D cols. 3 & 4.
(3) World Bank (1991).

Notes: (1) % for lowest basic salary.
(2) % for highest basic salary.
(3) % of real local currency GNP per capita, 1985 to 1975.

Table 8
Government Expenditure on Wages and Salaries

<u>Country</u>	<u>(1)</u>	<u>(2)</u>	<u>(3)</u>	<u>(4)</u>	<u>(5)</u>
Benin	30.7	31.9	42.0	.	.
Botswana	24.0	25.1	20.1	17.1	.
Burkina Faso	.	52.1	49.0	16.9	95.8
Burundi	.	22.3	21.5	.	98.6
Cameroon	34.0	25.5	27.9	11.0	.
CAR	.	57.1	55.5	18.1	97.8
Chad	.	21.2	12.3	.	.
Congo	.	18.6	34.5	.	.
Cote d'Ivoire	.	26.6	37.4	18.2	85.3
Djibouti	38.0	43.5	51.9	.	.
Ethiopia	37.6	32.4	28.8	9.9	.
Gabon	10.8	17.2	27.1	.	.
Gambia	23.3	25.0	15.5	13.6	.
Ghana	26.0	26.6	33.3	18.8	.
Guinea	.	33.0	16.0	.	.
Guinea-Bissau	.	24.2	12.5	10.7	.
Kenya	29.2	28.8	32.4	19.1	.
Lesotho	32.4	33.5	28.1	14.1	99.9
Liberia	27.9	37.0	35.7	13.8	78.3
Madagascar	.	31.7	30.1	15.1	99.5
Malawi	14.3	17.0	18.0	11.6	91.5
Mali	54.3	26.4	26.3	11.2	98.3
Mauritania	30.8	28.7	30.2	.	.
Namibia	.	19.7	23.6	.	.
Niger	19.0	17.0	21.1	12.8	98.2
Nigeria	11.7	8.6	.5	7.4	.
Rwanda	33.0	28.9	25.4	17.4	94.7
Senegal	.	38.4	.	18.5	.
Sierra Leone	27.9	29.7	12.9	13.8	.
Somalia	.	15.5	4.6	5.0	.
Sudan	11.0	.	.	.	.
Swaziland	29.2	34.1	35.9	19.5	.
Tanzania	25.4	21.8	20.7	12.0	58.2
Togo	16.2	26.7	26.8	16.8	98.2
Uganda	.	12.9	.3	.	.
Zaire	36.8	24.1	17.7	12.0	.
Zambia	25.8	28.8	23.4	12.6	89.6
Zimbabwe	31.6	26.9	30.0	18.6	89.6

Source: World Bank (1992, Table 7-14) for (1)-(3), Table 7-22 for (4) and Lockheed et al (1991, Table A-19) for (5).

Notes: (1)-(3) % share of wages and salaries in government expenditure and lending minus repayments, for 1975-79, 80-85 and 86-MR, respectively.
 (4) % share of expenditure on education in government expenditure and lending minus repayments, 1980-85.
 (5) % share of teacher emoluments in recurrent expenditure on primary education, various years, 1979-1986.

Table 9
Educational Indicators

<u>Country</u>	<u>(1)</u>	<u>(2)</u>	<u>(3)</u>	<u>(4)</u>	<u>(5)</u>	<u>(6)</u>
Benin	.	.	64	63	48	35
Botswana	60.1	76.4	92	116	32	32
Burkina Faso	5.0	4.6	18	31	55	65
Burundi	.	.	29	70	.	.
Cameroon	15.9	34.1	104	108	52	51
CAR	.	.	71	67	60	70
Congo	.	.	.	.	54	66
Ethiopia	2.9	4.3	35	36	64	43
Gabon	.	.	.	.	45	46
Gambia	8.3	4.0	51	61	24	28
Ghana	10.3	12.0	80	73	30	24
Guinea	.	.	31	30	36	40
Guinea-Bissau	.	.	67	53	23	25
Kenya	17.7	21.0	115	93	38	33
Lesotho	26.4	36.9	103	112	48	56
Liberia	19.8	17.1	.	.	.	.
Madagascar	11.3	5.6	143	97	38	41
Malawi	4.9	4.5	60	72	.	.
Mali	7.4	6.5	27	23	42	38
Mauritania	.	.	37	52	42	50
Niger	14.6	7.4	27	30	42	41
Nigeria	3.4	1.6	97	62	.	.
Rwanda	.	.	63	64	59	57
Senegal	.	.	46	59	46	54
Sierra Leone	4.7	1.7	52	53	.	.
Somalia	1.9	0.4	.	.	.	.
Swaziland	53.6	51.7	103	105	34	33
Tanzania	.	.	93	66	42	33
Togo	23.0	22.9	71	101	55	52
Uganda	2.1	1.4	50	77	.	.
Zaire	5.5	2.7	94	76	.	.
Zambia	13.6	9.2	.	.	.	.
Zimbabwe	32.8	51.3	85	128	.	.

Source: World Bank (1992) Table 7-23 for (1)-(2), Table 13-7 for (3)-(4) and Table 13-13 for (5)-(6).

Notes: (1)-(2) per capita expenditure on education in 1987 US dollars, 1980 and 1987 respectively.
(3)-(4) primary school gross enrollment rate, 1980 and 1988 respectively.
(5)-(6) primary pupil teacher ratio, 1980 and 1988 respectively.

