United Nations E/C.16/2004/7

Economic and Social Council

Distr.: General
17 February 2004

Original: English

Committee of Experts on Public Administration
Third session
New York, 29 March-2 April 2004
Item 3 of the provisional agenda*
Revitalizing public administration

Basic data on government expenditure and taxation

Report of the Secretariat**

Summary

The present report, which updates and expands earlier work by the Department of Economic and Social Affairs of the United Nations Secretariat, looks at expenditure and revenue of lower levels of government in addition to those of central Governments. The report laments the absence of consolidated general government accounts and recommends that their compilation, especially of expenditure by function, be given priority.

Contents

* E/C.16/2004/1.
** The late submission of the present report was due to the need for additional data.

04-24268 (E) 100304

0424268

Introduction and summary

1. The public sector consists of government, which operates outside the market, plus public enterprises that operate in the market. Government collects taxes, subsidizes private and public institutions, transfers income to groups such as the unemployed, pensioners or owners of government bonds, and supplies varied goods and services without charge (or at economically insignificant prices). Public enterprises are involved in myriad useful activities, ranging from producing steel and generating electricity to operating postal systems, but so long as they charge customers for goods and services, they are not part of government, and are excluded from the statistics that follow.[1]

2. The present report updates the public sector indicators compiled four years ago by the Division for Public Economics and Public Administration of the United Nations Secretariat and made available in electronic form (at www.unpan.org) and in print (as part two of *World Public Sector Report, 2001: Globalization and the State*[2]). It expands on that early work by looking at expenditure and revenue of lower levels of government in addition to those of central Governments. At the same time, it is less comprehensive because it focuses on cash flows, but ignores employment. This is dictated by the availability of data: data are incomplete for government expenditure and taxation, especially at lower levels of government, but they are most often non-existent for public sector employment. All data are drawn from the latest Penn World Table (PWT),[3] the International Monetary Fund (IMF) *International Financial Statistics* and the IMF *Government Finance Statistics*. They are described and analysed for the years from 1900 through 2002 in five major categories: (a) government consumption (a form of expenditure), (b) central government expenditure, (c) central government tax revenue, (d) local government expenditure and taxation and (e) total government tax revenue.

3. Government consumption is a subset of total government expenditure and includes all levels of government. Broadly defined, it consists of goods and services provided by government to the public. It excludes subsidies and cash transfers, such as payment of old age pensions or interest on public debt. Narrowly defined, it is known as *actual* government consumption and is restricted to expenditure on collective services that benefit the entire community rather than specific individuals or groups of individuals. The narrow definition is used only rarely, but estimates of government consumption based on the broad definition are widely available.

4. Although gross domestic product (GDP) is sometimes characterized as “gross domestic product at market prices”, this characterization is not entirely accurate. Government consumption is a component of GDP and is measured not at market prices (which are zero), but rather by whatever government spends to supply the public with “free” goods and services. When a firm in the private sector provides a free service to the public, its cost is excluded from GDP because the market price is zero; when government offers a free service, the cost is included in GDP. If a commercial radio station, providing free broadcasts to listeners, is transferred from private to non-commercial government ownership, measured GDP will thus rise.

5. This report shows that, when measured in domestic prices, the ratio of government consumption to GDP has exhibited little trend in recent years, with the median or midpoint observation for 101 countries having increased only from 15.2 per cent in 1990 to 15.6 per cent in 2002. What *has* happened is that there has been

decreasing divergence, that is to say, countries have tended to converge to similar values for this statistic. Despite increasing overlap between groups of countries, a large gap remains between developed and developing countries: the median ratio of government consumption to GDP for developed countries exceeds 18 per cent, whereas the median ratio for developing countries is less than 14 per cent (see table 1).

6. One must keep in mind, when examining components of GDP measured in the domestic prices of each country, that relative prices vary from country to country. Since services, such as haircuts, health care, schooling and general administration, are seldom traded internationally, their cost tends to be lower, the lower the level of wages. Goods, on the other hand, are frequently traded internationally, hence their prices tend to be similar across countries, regardless of wage differences. Since services dominate government consumption, their relative price is higher, the higher the level of wages.

7. Purchasing power parity (PPP) estimates correct for differences in relative prices, measuring GDP as though costs of goods and services were everywhere the same. In PPP prices, the rankings of developed and developing countries are reversed, with a median ratio of government consumption to GDP of 16 per cent for developed countries and 21 per cent for developing countries. Countries with economies in transition have the highest ratios of all of government consumption to GDP, when measured in PPP prices.

8. Data on government expenditure are almost as widely available as data on government consumption, but inasmuch as consolidated accounts exist only for central Governments, this is what is typically reported as “government expenditure”. Although such statistics are available only in domestic (not PPP) prices and miss a large and variable portion of total government expenditure, in this report they are nonetheless described in some detail. Central government expenditures follow the pattern of government consumption in domestic prices, and tend to be higher, as a percentage of GDP, in developed and transitional countries than in developing countries. The pattern for central government tax revenue is much the same, but revenue from taxes on international trade is particularly important in developing countries, especially those of Africa and Asia, while payroll taxes are important sources of revenue in developed and transitional economies.

9. For only 68 countries, somewhat more than half the number with data on government consumption or central government expenditure, is there *any* information at all on expenditure by lower levels of government for the years beginning with 1990. It is tempting, when such data exist, to add local and central government expenditure to obtain a figure for *total* government expenditure; however, since these accounts are not consolidated, such an exercise would involve considerable double-counting and an overestimate of total government outlays. Tax revenue (though not general revenue, which includes intergovernmental transfers) is less affected by failure to consolidate accounts, for different levels of government are not known to claim to have collected the same taxes. The sum of tax revenue of each level of government thus provides an accurate — or at least an unbiased — estimate of total tax revenue.

10. In order to have some idea of changes over time in the amount of tax revenue collected, we have divided the sample into two periods, 1990-1995 and 1996-2001, and calculated the average ratio of tax revenue to GDP in each period. For only 48

countries was there at least one observation in each of the two periods: 21 of these countries were classified as developed, 14 as transitional and 13 as developing. For the entire sample of 48, the median tax ratio increased only slightly, from 33.5 to 33.8 per cent of GDP, but the median increased sharply (from 38 to 40 per cent) for the developed countries, remained steady at 19 per cent for the 13 developing countries and decreased sharply (from 35 to 31 per cent) for the transitional economies. It must be emphasized, however, that this was not a random sample of countries, and the 13 developing countries were representative of middle-income rather than low-income developing countries.

11. The ratio of tax revenue to GDP is often referred to as a measure of "tax burden", but this term is a misnomer, for two reasons. First, Governments can burden citizens without collecting a cent in taxes. An excellent example is the Government of Singapore, which forces workers to contribute 40 per cent of their wages to a State-administered Central Provident Fund in lieu of payroll taxes, which are nominally zero. Another example is Japan, which until recently prohibited imports of rice. This raised the domestic price to consumers, yet produced no tax revenue for the government. The apparent tax burden of such a policy was zero, yet the import restriction effectively acted as a tax levied on rice, the proceeds of which were collected by local rice producers rather than by the Government. There are many more examples of similar burdens imposed by government on consumers and workers, in virtually every country of the world.

12. A second reason that tax ratios do not measure tax burdens is that they take no account of benefits received from government expenditure, and therefore assume implicitly that none of the revenue collected flows back to taxpayers in any way. If government is corrupt or inefficient, it is quite possible for even a low tax ratio to represent a high burden on taxpayers, who receive little or nothing for their money. In other words, efficiency of government expenditure matters. When expenditure consists of transfers of cash, or vouchers that can be exchanged for food, shelter or other services in the market, measurement of efficiency is straightforward, answering the question, What is the cost of administering the programme, and do the transfers in cash or in kind reach those whom they are intended to reach? When government itself produces the service, there is no market test, hence measurement of efficiency is difficult, though not impossible.

13. Compilation of consolidated general government accounts, especially expenditure by function, should be a priority. Once a country has such accounts, attention can be focused on remaining problems such as quantification of tax expenditures, the quasi-fiscal impact of regulation and trade restrictions, and the need to move from cash to accrual reporting of expenditure in the public sector.[4] All of these problems, important as they are, are minor compared with that of the complete lack of consolidated general government accounts in all countries, and the lack of any accounts at all for lower levels of government in most developing countries. If analysts have no idea what government is spending, nor on which goods and services, it is impossible even to begin to analyse the efficiency or efficacy of such spending.

I. Government consumption

14. Government consumption is the most widely available, but also the least understood measure of government activity. It is widely available because government consumption is a component of demand for GDP, hence it is routinely estimated as part of national income accounts. The famous accounting identity of elementary macroeconomics is

$$GDP = C + I + G + (X-M)$$

15. In words, GDP is the sum of private consumption (C) plus gross investment (I) plus government consumption (G) plus net exports (X-M). Private consumption refers to household consumption of final goods and services only. Intermediate goods, which are inputs into the production of final goods, are not counted separately, since their value is already included in the price of final goods. There is no term for business consumption because corporations consume only intermediate goods. Workers, managers and stockholders consume final goods and services; corporations do not. Investment includes public as well as private capital formation.

16. Government consumption is poorly understood in part because the System of National Accounts (SNA) provides us with not one, but two definitions, one narrow, and the other much broader. Choice of one definition instead of the other does not affect measurement of total GDP, for national income accountants allocate to private consumption all consumption expenditure that is not allocated to government. Both definitions refer to general government consumption, including that of municipal government, and not just the central government consumption.

17. The narrow definition of government consumption, according to which it is known somewhat unhelpfully as actual final consumption of government,[5] restricts it to expenditure by government on collective services that benefit all of society, specifying that "(A)lthough collective services benefit the community, or certain sections of the community, rather than the government, the actual consumption of these services cannot be distributed among individual households, or even among groups of households such as subsectors of the household sector." (1993 SNA, para. 9.91). This effectively limits government consumption to general administration and other collective consumption goods such as public order and defence. Under this definition, government expenditure on health care and education is classified as private consumption because services are delivered to specific patients and students, not to society in any collective sense.

18. The broad definition of government consumption, according to which it is known as government final consumption expenditure, determines that it is equal to actual final consumption of government (expenditure on collective services) plus government expenditure on individual consumption goods and services such as health care and education. This measure of government activity is much larger than that of the narrow definition. Nonetheless, it is smaller than that of government expenditure, for cash transfers are excluded, as are outlays for investment.

19. Why classify as government consumption expenditure any goods and services that are consumed by private individuals? The principle behind the broad definition of government consumption is that consumption is private only when households are free to choose how or whether to spend the income.[6] Government transfers in kind, such as food, housing, health care and schooling, are thus classified as

government consumption. An individual is free to consume or not consume free health care, but she is not free to reduce consumption of free health care in order to increase her savings or her consumption of clothing. It makes no difference whether the institution that supplies the good or service is private or public. All that matters is that government finance the specific consumption. If the consumer pays something out of pocket, such as tuition fees for education, or a fixed charge for each visit to a clinic or hospital, then part of the expenditure is allocated to government and part to private consumption. If the consumer pays nothing, the entire expenditure is allocated to government consumption expenditure, regardless of whether the school, hospital or clinic is under public or private management.

20. Government final consumption expenditure figures, based on the broad definition of government consumption, are published monthly for a large number of countries in the IMF *International Financial Statistics*. These are reported in domestic prices, as a component of GDP. The cost of government consumption relative to the cost of the remainder of GDP varies from country to country, making inter-country comparisons difficult. Services, such as schooling, nursing or general administration, are seldom traded internationally, hence their cost is lower in countries with low wages. Goods are exported and imported, therefore the cost and prices of goods tend to be similar across countries regardless of the level of wages. In other words, the relative price of services is low in low-wage countries. Services dominate government consumption, therefore division of government consumption expenditure (in local prices) by GDP (also in local prices) biases downward our estimates of the share of government consumption in the GDP of low-income countries.

21. The International Comparison Programme (ICP) coordinated by the World Bank has addressed this problem by estimating the GDP of selected countries and selected years in prices of a numeraire country, the United States of America. These prices are known as PPP prices because with them one United States dollar has the same purchasing power everywhere in the world for a uniform basket of goods and services.[7] A group of researchers noted certain regularities between shares of major expenditure components of GDP measured in domestic prices and shares of the same components measured in PPP prices. They used statistical techniques to extrapolate the PPP estimates to years and to countries not included in the ICP. The results are known as the Penn World Table (PWT), as mentioned above. The latest version contains statistics for 168 countries for some or all of the years 1950-2000.[8]

22. Unfortunately, the current version of PWT contains what appears to be a serious defect: it fails to apply a consistent definition of government consumption. Most observations clearly reflect a broad definition of government consumption, but for some of the developed countries, for some recent years, the narrow definition has been applied. In the case of Sweden, for example, PWT 6.1 reports for the years 1990-2000 the following estimates of government consumption as a percentage of GDP:

1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
24.9	25.0	26.0	7.7	7.4	6.8	6.9	6.8	6.6	6.6	23.9

23. There is no reason to believe that government consumption in Sweden fell sharply in 1993 and then rose, equally sharply, in the year 2000. What must have happened is that the compilers of PWT used a narrow definition of government consumption (actual final consumption) in those few cases where this was possible, and a broad definition (government final consumption expenditure) in all other cases. This eliminates the possibility of comparing government consumption across countries, which is precisely what PPP estimates are supposed to facilitate.

24. Because of this problem, we have used not PWT PPP estimates of government consumption, but rather PWT estimates of the price of government consumption relative to the price of GDP. We then divided IMF *International Financial Statistics* government consumption expenditure in domestic prices by the PWT relative price of government consumption in order to obtain an estimate of government consumption expenditure in PPP prices. This estimate differs from that of PWT only where the PWT domestic price data differ from the *International Financial Statistics* data, in other words, where national accounts in domestic prices have been revised, or where the PWT uses a narrow rather than a broad definition of government consumption. Another serious problem, which we have not been able to address, is that PPP accounts measure prices but make no allowance for the possibility that low prices may reflect low quality of services in low-income countries.

25. Appendix table A1 (see annex for a list of the appendix tables, which can be accessed at www.unpan.org/statistical_databasepublicsector.asp) reports IMF *International Financial Statistics* and PWT 6.1 data by country for selected years beginning in 1990, and the results of this calculation of government consumption expenditure in PPP prices.[9] The resulting PPP estimates look reasonable, with the exception of a few cases, for example, that of the sharp and unbelievable fall in government consumption for the year 2000 in Iceland, New Zealand and Spain. Hopefully, this problem will be addressed in a future version of the Penn World Table.

26. Table 1 provides summary measures for the year 2000 for the complete sample of 119 countries and for five main groups of interest (developed countries, transitional countries, developing Africa, developing Latin America and developing Asia). The median (midpoint) of each distribution was reported rather than the mean (simple average) because the median is a better measure of central tendency for data containing extreme values. Median government consumption in domestic prices, as a percentage of GDP, was 18.9 in developed countries and nearly as large — 18.5 — in countries with economies in transition, but only 13.7 in the developing countries. The relative price of government consumption tended to be much higher in developed counties; therefore, at PPP prices, the developing countries recorded higher ratios of government consumption relative to GDP. Transitional economies had even higher PPP ratios of government consumption to GDP, a result of high ratios in domestic prices combined with low relative prices for government consumption.

Table 1
Government consumption as a percentage of GDP in domestic and PPP prices, various country groups, 2000[a]

(Median value)

	Number of countries	*Domestic prices*	*Relative price of government consumption*	*PPP prices*
Complete sample	119	15.6	0.72	20.8
Developed countries	24	18.9	1.13	16.2
Transitional economies	14	18.5	0.65	26.4
Developing countries	81	13.7	0.60	21.0
Africa	32	13.9	0.70	20.9
Latin America and the Caribbean	28	14.6	0.60	21.2
Asia and Oceania	21	11.4	0.54	24.2

Source: Appendix table A1.
[a] Earlier years for 10 countries.

27. A key finding presented in table 1 was that the share of government consumption in GDP, in domestic prices, tended to be larger in the developed than in developing countries; this was reversed with PPP prices, which showed developing countries as having far larger shares for government consumption. This was an interesting and plausible result, but a caveat is in order. While there is no doubt that domestic prices understate the importance of government consumption in low-income countries, PPP estimates may well create a bias in the opposite direction. Services provided by government are not sold on domestic markets, much less on international markets, therefore their value is measured by expenditure on inputs; moreover, it is very difficult to correct for differences in quality. Schoolteachers and administrators in Burkina Faso are paid much less than schoolteachers and administrators in the United States. Is the quality of their work and their productivity identical? PPP estimates assume so if years of training are the same, hence they adjust only for differences in the average years of schooling that such workers bring to their jobs.

28. Figures I, II and III summarize the data of appendix table A1 for the year 2000 in a different way. The figures contain modified box plot or "box and whisker" diagrams, modified because they do not show the medians reported in table 1. Each box plot contains a vertical line drawn from the lowest value in the series to the highest value. This is the "whisker" of the diagram, which shows graphically the full range of observations for each series. The bottom of the box marks the twenty-fifth percentile and the top marks the seventy-fifth percentile. The box thus encompasses the middle two quartiles: the middle 50 per cent of observations for each group of countries. Box plots are often used to identify outliers: a very long "whisker" relative to the height of the box probably indicates at least one outlier in the data. For our purposes, the box is more interesting than the whisker, for it is a broad measure of central tendency. The height of the box shows the range of observations, absent the smallest 25 per cent and the largest 25 per cent. If we arrange observations for 24 countries in ascending order of size, the range of the

smallest 6 defines the bottom whisker, that of the next 12 defines the box, and that of the largest 6 defines the top whisker of the diagram.

Figure I
Ratio of government consumption to GDP in domestic prices, various country groups, 2000
(Percentage)

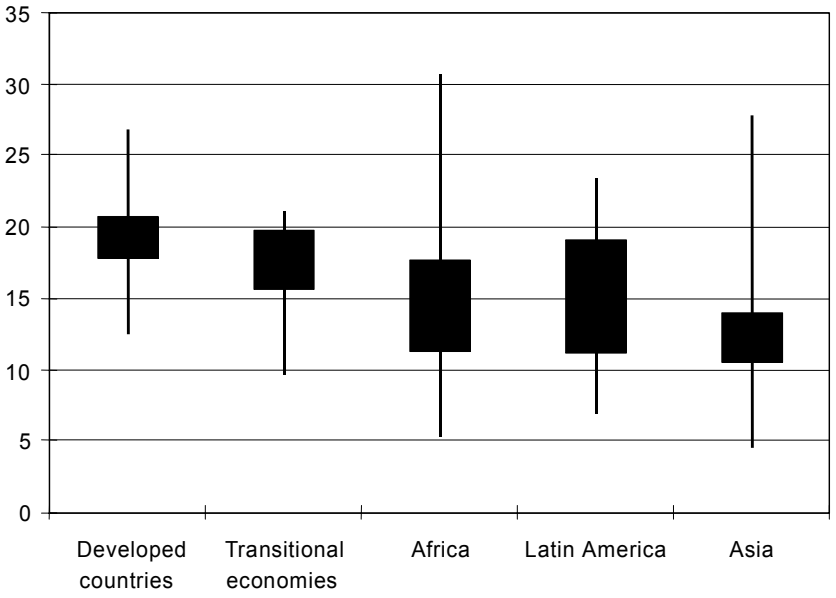


Figure II
Ratio of price index of government consumption to price index of GDP, various country groups, 2000

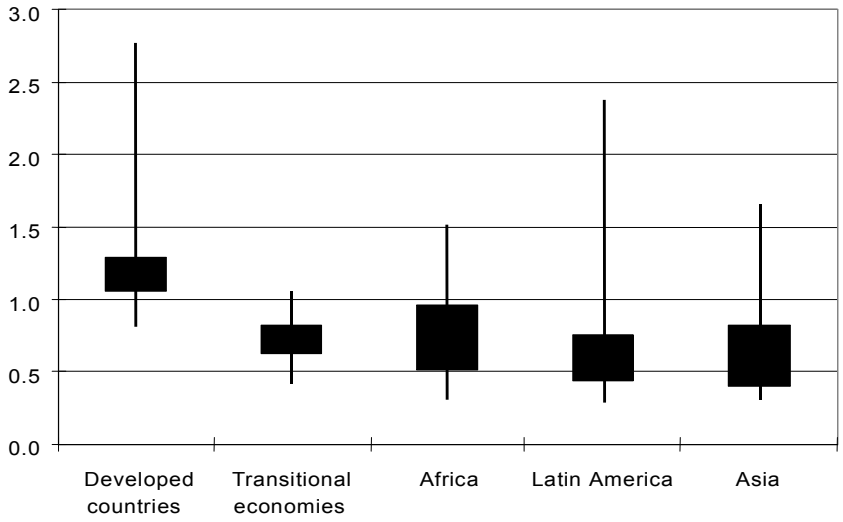
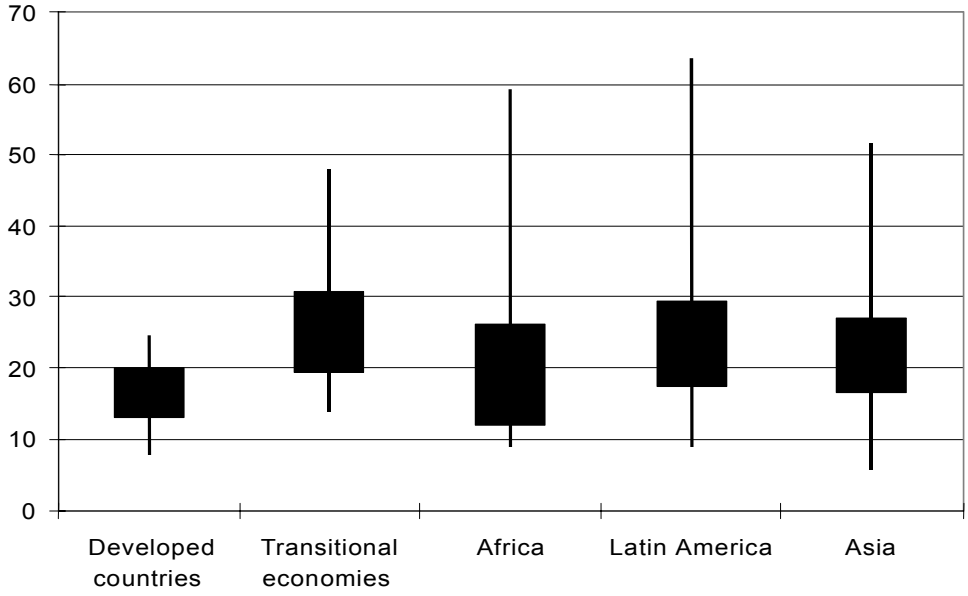


Figure III
Ratio of government consumption to GDP in PPP prices, various country groups, 2000
(Percentage)



29. Looking at the whiskers in figures I, II and III, what is striking is the very large overlap of observations. Figure I, for example, shows that some developing countries in Africa and Asia had ratios of government consumption to GDP that were larger than the largest ratio in developed countries, even though the central tendency was for ratios to be lower, in domestic prices, in the developing countries. Looking at the boxes, there is some overlap, but much less. In figure I, the middle two quartiles of Asia stand out as having much lower ratios of government consumption to GDP compared with those of developed and transitional economies, and as having much less dispersion compared with those of the other two groups of developing countries. In figure II (price ratios), the box for developed countries is well above those for the other four groupings, with no overlap. In figure III (ratios of government consumption to GDP in PPP prices), there is considerable overlap, except for the boxes of developed and transitional economies.

30. Table 2 reports, for domestic prices, the median ratios of government consumption to GDP for 101 countries in 1990, 1996 and 2002, and 114 countries in 1996 and 2002. Only countries with observations for both points of time were retained, in order to infer something about changes in government consumption over time. First, comparing the figures for 1990 and 2002 reveals that median government consumption as a share of GDP for 101 countries increased only slightly, from 15.2 to 15.6 per cent, and that Latin America showed a very strong increase, from a median value of 12.9 per cent in 1990 to 14.6 per cent in 2002. From 1996 to 2002, median government consumption as a share of GDP for the full sample of 114 countries increased only slightly, from 15.3 to 15.7 per cent and the

transitional economies registered a fall of 2 percentage points, from 20 to 18 per cent, while the median value for each of the three groups of developing countries registered increases of more than 1 full percentage point.

Table 2
Government consumption as a percentage of GDP in domestic prices, various country groups, 1990, 1996, 2002
(Median value)

	Number of countries	*1990*	*1996*	*2002*[a]
Complete sample	114		15.3	15.7
less transitional economies	101	15.2	14.3	15.6
Developed countries	24	18.9	19.4	19.1
Transitional economies	13		20.0	18.0
Developing countries	77	14.2	12.7	14.0
Africa	26	15.1	12.8	14.7
Latin America and the Caribbean	25	12.9	13.4	14.6
Asia and Oceania	26	12.2	11.7	13.0

Source: Appendix table A1.
[a] Or latest data (2000, 2001).

31. Figures IV-VII analyse the same data as does table 2, with box plots instead of medians. Figure IV illustrates once again that there was little change in central tendency of government consumption for the full sample of countries between 1990 and 2002, but the height of the box fell, indicating convergence in ratios of government expenditure to GDP for the middle two quartiles of the distribution. From figures V, VI and VII, it can be seen that this convergence was especially strong for the developed countries, but that it took place in the developing countries as well, and in the transitional economies between 1996 and 2002. When observations for the 77 developing countries are plotted by region (not shown), there is evidence of convergence for Latin America and Asia, but not for Africa. This is an interesting pattern that warrants further study. To what extent is the observed convergence of the middle of the distribution real, and to what extent might it reflect convergence of national income accounting standards? Why do the full ranges of data (the whiskers) not show similar convergence?

Figure IV
Full sample: ratio of government consumption to GDP in domestic prices, 101 countries, 1990, 1996 and 2002
(Percentage)

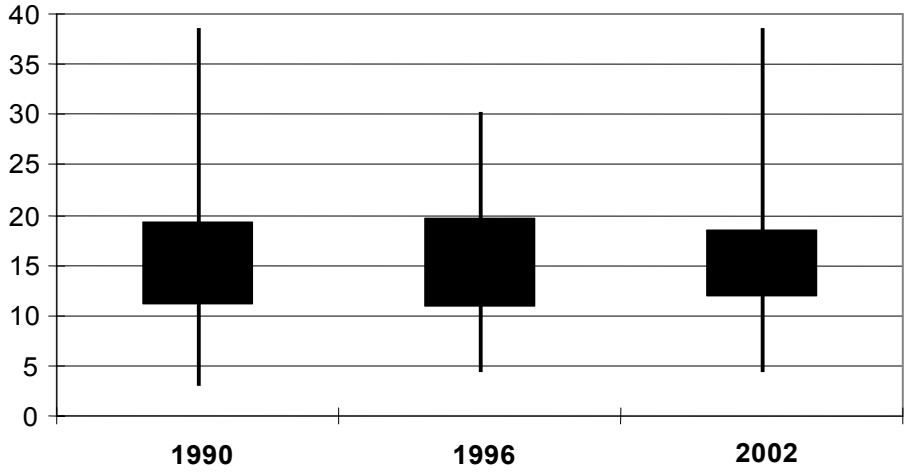


Figure V
Developed countries: ratio of government consumption to GDP in domestic prices, 24 countries, 1990, 1996 and 2002
(Percentage)

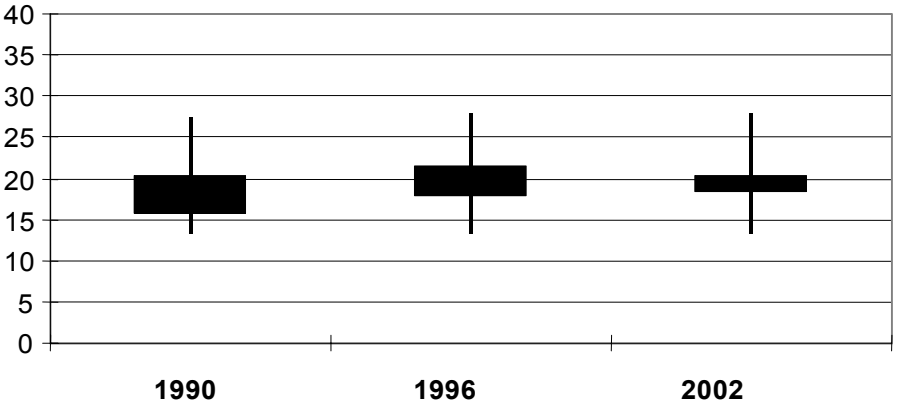


Figure VI
Transitional economies: ratio of government consumption to GDP in domestic prices, 13 countries, 1996 and 2002
(Percentage)

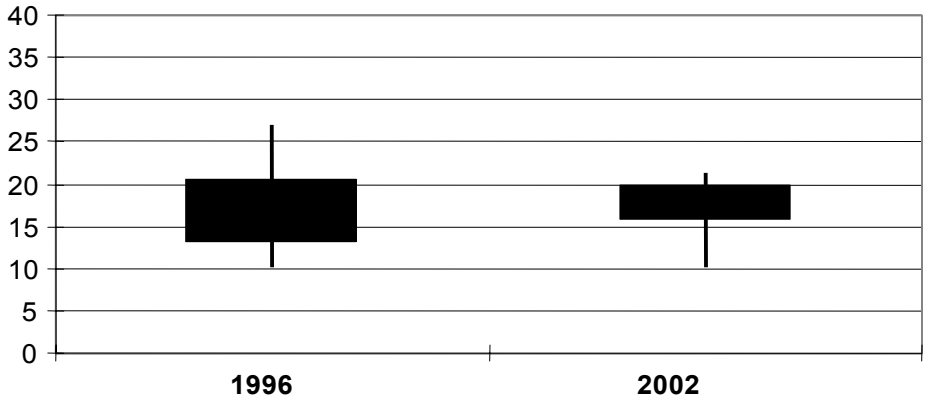
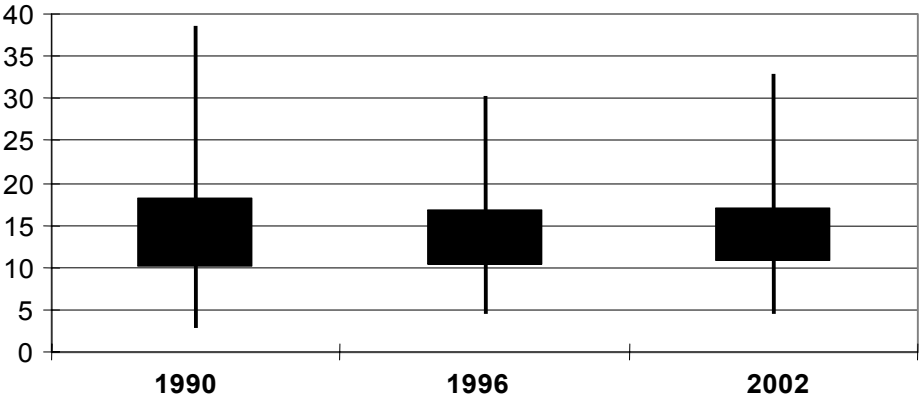


Figure VII
Developing countries: ratio of government consumption to GDP in domestic prices, 77 countries, 1990, 1996 and 2002
(Percentage)



II. Central government expenditure

32. A second measure of government activity is central government expenditure, which includes cash transfers and subsidies and outlays for investment in addition to expenditure on consumption. These statistics, which are almost as widely available and widely used as government consumption, have three drawbacks. First, they record investment expenditure rather than depreciation of capital, so that all the outlay for a large highway or a new port, for example, shows up in the years of construction and not in subsequent years when the highway or port is actually in use. Second, the statistics include only transfers to lower levels of government and ignore self-financed expenditures of provincial (State) and municipal governments. Third, they exclude tax expenditures, that is to say, subsidies and transfers given in the form of tax relief rather than in cash or transfers in kind.

33. Appendix table A2 reports by country all available data on central government expenditure as a percentage of GDP for the years 1990 through 2002. The expenditure data are from IMF *Government Finance Statistics* and the GDP data are from IMF *International Financial Statistics*. For a number of countries, the fiscal year for national income accounts differed from the fiscal year used for government finance. In such cases, GDP figures were adjusted to yield an estimate of GDP that coincided with the fiscal year of government accounts. For example, if the fiscal year for national income accounts was the calendar year and the fiscal year for government accounts was the 12-month period ending at the end of September, GDP for fiscal year 1999/2000 was estimated as the sum of one fourth of GDP for the year 1999 plus three quarters of GDP for the year 2000.

34. Median values of the expenditure/GDP ratio are reported in table 3 for groups of countries in the periods 1990-1995 and 1996-2002. The sizes and compositions of the samples varied in the two periods, therefore no importance should be given to comparisons over time. In both periods, median central government expenditures as a share of GDP of the developed countries were somewhat larger than those of transitional countries, and much larger than those of developing countries. Among developing countries, Africa was a region with relatively high central government expenditure, having recorded a median value of 30 per cent of GDP in 1990-1995 and 29 per cent of GDP in 1996-2002.

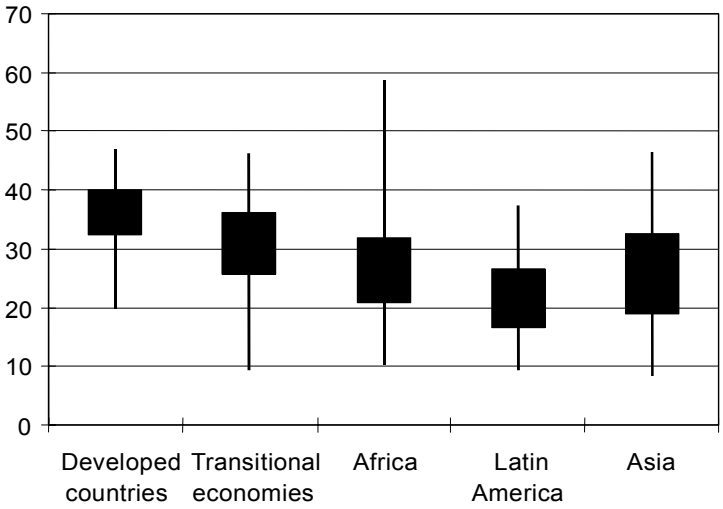
Table 3
Central government expenditure as a percentage of GDP in domestic prices, various country groups, 1990-1995 and 1996-2002
(Median value for each period)

	1990-1995		*1996-2002*	
	Number of countries	*Median*	*Number of countries*	*Median*
Complete sample	123	28.7	111	29.2
Developed countries	23	39.6	22	36.8
Transitional economies	16	34.9	19	32.3
Developing countries	84	25.2	70	24.1
Africa	30	29.8	23	28.6
Latin America and the Caribbean	25	21.8	19	21.0
Asia and Oceania	29	26.0	28	23.6

Source: Appendix table A2.

35. Figure VIII summarizes, with box plots, the same data, but only for the period 1996-2002. Again, the developed countries clearly tended to have higher ratios of central government expenditure to GDP than the developing countries. Note the absence of overlap between the boxes (the middle two quartiles of the distribution) of the developed countries and those of the three groups of developing countries. There was, however, considerable overlap among the boxes for all three groups of developing countries, so that Africa no longer stood out among developing countries as a region of high central government expenditure.

Figure VIII
Ratio of central government expenditure to GDP, various country groups, 1996-2002
(Percentage)



36. Table 4a summarizes for the entire sample and for groups of countries the distribution of central government expenditures by function as a share of total expenditure. These are simple averages of data from appendix table A3 for the entire period 1990-2002 and are grouped under four main headings: traditional State functions, modern State functions, interest payments, and other expenditure. Traditional expenditures are those for general administration, justice, police and defence. For the most part, these are expenditures on collective consumption goods. Modern State functions encompass transfers in kind, largely for education and health care, plus cash transfers and subsidies. Modern expenditures are thus directed to individual households and productive enterprises: they form the basis of the modern welfare State. Interest payments need no explanation, but it should be noted that these represent payments of nominal interest. For countries with high inflation, provided debt is denominated in local currency, a large part of these payments might more properly be classified as debt repayment rather than as debt servicing. Table 4b shows these same statistics as a percentage of GDP in domestic prices.

37. Modern State functions accounted on average for 70 per cent of the budget of central Governments in developed countries and for 65 per cent in economies in transition, reflecting a long tradition of social expenditures in those countries. Modern functions were surprisingly important in the budgets of developing countries as well, and accounted for more than half of central government expenditures in Africa and Asia, and nearly two thirds of expenditures in Latin America. Developing countries allocated a large share of their budget to education compared with central government expenditures in developed countries, but this may reflect in part the fact that responsibility for education is more often transferred to lower levels of government in the developed world. The share of the budget allocated to military expenditure was very high on average in developing Asia (15 per cent) and Africa (10 per cent) compared with Latin America (6 per cent) and developed countries (5 per cent).

Table 4a

Central government expenditure by function as a percentage of total expenditure, various country groups, 1990-2002

(Simple average)

	Complete sample	*Developed*	*Transition*	*Developing*	*Africa*	*Asia*	*Latin America*
Traditional State functions	**20.1**	**11.2**	**14.1**	**24.4**	**25.7**	**27.5**	**19.2**
General administration and public order	11.1	5.8	6.9	13.7	15.4	12.8	13.3
Defence	9.0	5.3	7.2	10.6	10.3	14.7	5.9
Modern State functions	**60.5**	**70.3**	**65.0**	**56.4**	**50.1**	**54.9**	**64.1**
Education	12.8	7.8	7.2	15.9	16.1	15.1	16.7
Health	8.2	10.9	8.0	7.6	6.1	6.3	10.6
Other social services	23.5	42.0	36.4	14.5	10.1	12.3	21.3
Economic services	16.1	9.9	13.5	18.6	18.1	21.3	15.7
Interest payments	10.6	9.8	7.7	11.6	13.4	9.4	12.8
Other expenditure	8.5	7.9	12.8	7.4	10.4	8.1	3.7
Number of countries	**120**	**21**	**23**	**76**	**22**	**30**	**24**

Source: Appendix table A3.
Note: Observations for Belgium and Czechoslovakia were excluded from this summary table.

Table 4b

Central government expenditure by function as a percentage of GDP in domestic prices, various country groups, 1990-2002

(Simple average)

	Complete sample	*Developed*	*Transition*	*Developing*	*Africa*	*Asia*	*Latin America*
Traditional State functions	**5.3**	**3.9**	**3.8**	**6.1**	**6.2**	**7.7**	**3.9**
General administration and public order	2.9	2.1	1.9	3.4	3.9	3.5	2.8
Defence	2.4	1.8	1.9	2.7	2.4	4.3	1.1
Modern State functions	**17.8**	**25.0**	**22.1**	**14.5**	**14.3**	**15.1**	**13.9**
Education	3.6	2.9	2.5	4.1	4.6	4.1	3.6
Health	2.5	3.8	3.1	2.0	1.8	1.8	2.3
Other social services	7.4	14.9	12.4	3.9	3.2	3.8	4.7
Economic services	4.3	3.5	4.1	4.5	4.8	5.3	3.3
Interest payments	3.0	3.4	2.4	3.0	3.7	2.4	3.0
Other expenditure	2.1	2.6	3.0	1.7	2.5	1.9	0.7
Number of countries	**111**	**21**	**19**	**71**	**21**	**28**	**22**

Source: Appendix tables A2 and A3.
Note: Observations for Belgium and Czechoslovakia were excluded from this summary table.

38. An important omission from these data is tax expenditure, which can be very important in some instances. The United States, for example, provides universal health care only for those over age 65. Approximately 70 per cent of residents under age 65 have private health insurance and, of these, nearly all are covered through their employer. The United States exempts employer contributions to health insurance from the taxable income of the employee. This tax expenditure (reduced income tax revenue) exceeds $90 billion a year and is not included in government finance statistics.[10]

III. Central government tax revenue

39. Appendix table A4 reports, by country, all available data on central government tax revenue as a percentage of GDP for the years 1990 through 2002. The sources were the same as those used for the expenditure data (IMF *International Financial Statistics* and *Government Finance Statistics*) and the GDP figures were adjusted in the same way for countries in which the fiscal year for national income accounts differed from that used for government finance. Tax revenue tended to be lower than expenditure because Governments had access to sources of revenue other than taxes: they charged fees for licences and for use of public property, collected royalties on the extraction of oil and minerals, and borrowed money.

40. Median values of the tax revenue/GDP ratios are reported in table 5 for groups of countries in the periods 1990-1995 and 1996-2002. The two periods are not comparable because the sizes and compositions of their samples varied. In both periods, median central government tax revenue as a share of GDP of the developed countries was somewhat larger than that of the transitional countries, and much larger than that of developing countries.

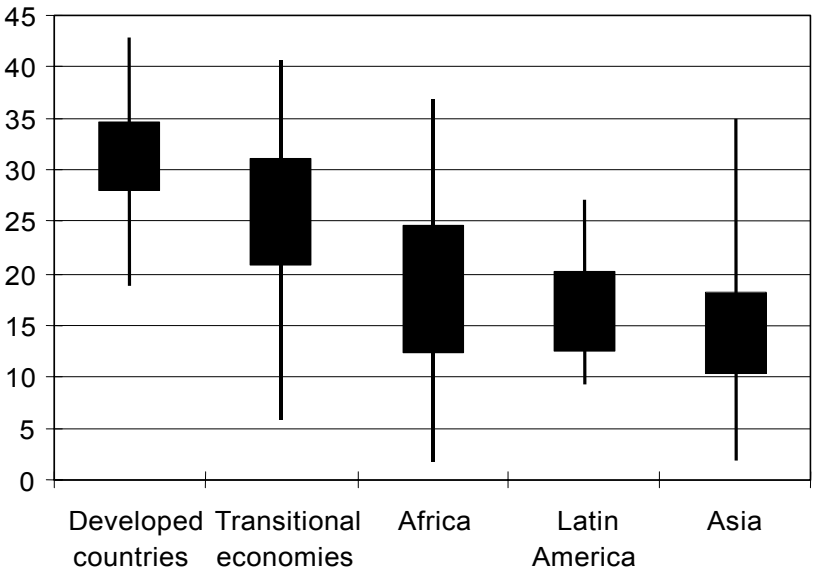
Table 5
Central government tax revenue as a percentage of GDP in domestic prices, various country groups, 1990-1995 and 1996-2002
(Median values)

	1990-1995		*1996-2002*	
	Number of countries	*Median*	*Number of countries*	*Median*
Complete sample	123	20.3	111	20.2
Developed countries	24	30.8	23	31.3
Transitional economies	16	28.4	19	25.4
Developing countries	83	17.3	69	15.7
Africa	28	19.2	22	17.4
Latin America and the Caribbean	25	17.3	19	15.2
Asia and Oceania	30	16.6	28	15.2

Source: Appendix table A4.

41. Figure IX summarizes with box plots the same data for the 1996-2002 sample of countries. The pattern of the ratios of tax revenue to GDP is similar to that of the ratios of central government expenditure to GDP: highest in the developed and transitional economies, lowest in the developing countries. Nonetheless, the differences are more marked, as there is greater divergence of the box for the developed countries from those for the three groups of developing countries (see figure VIII).

Figure IX
Ratio of central government tax revenue to GDP, various country groups, 1996-2002
(Percentage)



42. Appendix table A5 reports available data by country from 1990 through 2002 on the importance in total tax revenue of four broad types of taxes: direct taxes on income and wealth, taxes on wages, taxes on sales (including value-added taxes) and taxes on international trade. Table 6a reports the median value, for groups of countries, of the average for each country over these years. The sample size of 139 countries was much larger than the sample size for tax/GDP ratios in the period 1990-1995 or 1996-2002. There are two reasons for this. First, for some countries there were observations only in the first period and for others only in the second. These would be included in the average for 1990-2002, but in only one of the two sub-periods. Second, some countries reported central government tax revenue, but not GDP, making it possible to include them in appendix table A5 but not in table A4.

Table 6a
Central government tax revenue by type of tax as a percentage of total tax revenue, various country groups, 1990-2002 averages
(Median value of simple averages)

	Number of countries	*Direct taxes*	*Payroll taxes*	*Sales taxes*	*Trade taxes*
Complete sample	139	27.1	5.9	34.8	14.6
Developed countries	24	34.8	28.5	28.1	0.5
Transitional economies	23	17.7	33.3	38.9	6.2
Developing countries	92	27.6	0.7	33.0	24.9
Africa	32	27.2	0.2	30.7	33.0
Latin America and the Caribbean	27	22.1	5.1	38.9	13.7
Asia and Oceania	33	34.1	0.0	34.8	25.6

Source: Appendix table A5.

43. The summary measures reported in table 6a show a distinct pattern of taxation. Revenue from taxation of international trade was very important for Governments in developing countries, particularly those in Africa and Asia, but of little importance in developed and transitional economies. The share of direct taxes on income and wealth in total tax revenue showed less variation, but tended to be low in the transitional economies and Latin America. Sales taxes were an important source of revenue for governments everywhere. The share in total tax revenue of payroll taxes, which included mandatory contributions to social security, were very high in developed and transitional economies, but very low in developing countries, particularly those in Africa and Asia. In fact, the median value for payroll taxes in 33 Asian countries was zero, which indicates that the central government in at least half of these countries collected no taxes on wages at all. The same statistics as a percentage of GDP in domestic prices are shown in table 6b, and the same patterns are evident.

Table 6b
Central government tax revenue by type of tax as a percentage of GDP in domestic prices, various country groups, 1990-2002 averages
(Median value of simple averages)

	Number of countries	*Direct taxes*	*Payroll taxes*	*Sales taxes*	*Trade taxes*
Complete sample	129	5.4	1.1	7.0	2.0
Developed countries	24	9.9	8.9	8.7	0.1
Transitional economies	18	5.5	8.7	11.2	1.6
Developing countries	87	4.3	0.1	5.2	3.0
Africa	30	4.6	0.0	5.2	5.0
Asia and Oceania	32	4.8	0.0	4.0	2.6
Latin America and the Caribbean	25	3.4	1.1	5.6	2.1

Source: Appendix tables A4 and A5.

44. Inter-country comparisons of payroll taxes can be quite misleading, as policies exist that encompass payroll taxes in everything but name. The United Kingdom of Great Britain and Northern Ireland, for example, allows workers to opt out of the State Earnings Related Pension Scheme (SERPS) provided that they contribute to a private plan. From the point of view of the worker, there is little difference: in each case take-home pay is reduced in exchange for the promise of a pension in old age. However, contributions to the State scheme are recorded as payroll taxes, whereas mandatory contributions to the private scheme are not. Countries that do not allow wage earners to opt out of part of social security falsely appear to have a much greater "payroll tax burden". An extreme example is Singapore, where, though payroll taxes are zero, every wage earner must contribute 40 per cent of his or her salary to the Central Provident Fund. These individual accounts exist to provide workers with retirement money, health care and other Government-approved benefits. This is similar to what in other countries is known as social security, yet none of these contributions are recorded as revenue by the Government of Singapore, hence the "burden" of the scheme on workers appears to be zero.

IV. Subnational (local) government expenditure and taxation

45. Information on activities of subnational governments is much less abundant than information on the activity of central government, particularly in developing countries. Expenditure at lower levels of government was available for at least some of the years 1990-2002 for 68 countries. These data are reported in appendix table A6, as a percentage of central government expenditure. Taking for each country the averages, for whatever years were available, of the ratios of local government expenditure and taxation to central government expenditure and taxation yielded 68 observations. As shown in table 7, coverage for developed and transitional economies was rather good (22 and 24 observations, respectively), but the small number of observations for developing countries means that results by region are meaningless. The median for the entire sample, at which point half the countries had a higher ratio and half a lower ratio, was 31.5 per cent. The medians for both developed and transitional economies were higher, but the median for the 22 developing countries was much lower, at 14.5 per cent.

46. The 22 developing countries for which data on local government expenditure existed did not constitute a random sample. Small countries that were not likely to have large local governments, such as Singapore, Belize and Fiji, were conspicuously absent, so that it is reasonable to conclude that the median observation for a larger sample of developing countries would have been even smaller. The evidence, then, points strongly to the conclusion that government in a typical developing country is highly centralized compared with government in developed and transitional economies.

Table 7
Local government expenditure and taxation as a percentage of central government expenditure and taxation averages for 1990-2002, various country groups
(Median value)

	Government expenditure			
	Total	*Education*	*Health*	*Tax revenue*
Median percentage				
Complete sample	31.5	185.8	69.1	14.2
Developed countries	38.5	185.8	78.7	21.2
Transitional economies	32.1	199.0	119.4	23.3
Developing countries	14.5	44.4	22.9	6.7
Number of observations				
Complete sample	68	53	53	67
Developed countries	22	17	17	22
Transitional economies	24	24	24	24
Developing countries	22	12	12	21

Source: Appendix tables A6, A7, A8 and A.9.

47. For 53 of the 68 countries, 12 of which were developing countries, there was also information on the functional distribution of local government expenditure. It is not known what proportion of these expenditures were financed by local taxation and borrowing rather than transfers from higher levels of government. Education and health care were of particular interest, as government expenditure on these services often dominated local government finances. Appendix tables A7 and A8 report these data, as a percentage of central government expenditure in the same category. Table 7 summarizes the results, by reporting the median observations for the average ratios available for each country over the years 1990-2002. These were not consolidated accounts, hence any expenditure financed by transfers from the central government added to both the numerator and the denominator of the ratio. As expected, median ratios for these categories of expenditure were much higher than the ratios for overall expenditure and, again, median ratios were much higher for developed and transitional economies than for the admittedly small sample of 12 developing countries. A further interesting result is that median ratios were much higher for education than for health, indicating that education tends to be more decentralized than health care.

48. For 67 of the 68 countries, there was also information available on tax revenue of local government. Observation was missing for Uruguay.

49. The summary results for tax revenue, shown also in table 7, were similar to those for expenditure. That the median ratio of local to central government tax revenue exceeded 20 per cent in developed and transitional economies, but was only 6.7 per cent in developing countries, is an indication that government expenditure tends to be much more centralized in developing countries. The fact that median

ratios were much lower for tax revenue than for expenditure is evidence of large transfer payments from central to local governments.

50. Table 8 lists the 10 countries with the largest ratios of local to central government expenditure. These were not consolidated government accounts, so all transfers from the central government to local governments appeared both as an expenditure of the central government and as an expenditure of local government. By this measure, these are the most decentralized of the 68 countries for which we have data. With the possible exception of Denmark and Argentina, there are no surprises in the list. Canada, Switzerland, the United States, India, Australia and Germany are important federal States, whose subnational units enjoy considerable local autonomy. China, though not a federal State, is a huge country, which requires decentralization to function. Netherlands Antilles is tiny, but its population is spread across five islands, each with its own local government.

Table 8
Countries with the highest ratio of local to central government expenditure, and their rank according to the ratio of local to central government expenditure on health and education and of local to central government tax revenue, 1990-2002

			Rank in ratio of local to central government expenditure on		
Rank	*Country*	*Total expenditure (percentage of central government expenditure)*	*Health*	*Education*	*Rank in ratio of local to central government tax revenue*
1	Canada	137.1	3	3	3
2	China: mainland	123.1	1	4	2
3	Netherlands Antilles	120.6	29	15	1
4	Switzerland	93.1	24	5	8
5	United States	88.8	25	2	9
6	India	84.5	17	6	7
7	Denmark	80.4	4	32	11
8	Argentina	74.6	11	16	5
9	Australia	72.5	22	22	21
10	Germany	65.3	33	1	14

Source: Appendix tables A6, A7, A8 and A9.

51. Surprisingly, only 3 of the 10 most decentralized countries in terms of total government expenditure ranked also among the 10 most decentralized in expenditure on health, and only 6 ranked among the 10 most decentralized in expenditure on education. For tax revenue, the correspondence with total expenditure was much closer, although the decentralization rankings for Germany and Australia (14 and 21, respectively) were fairly low. Since tax revenue, unlike expenditure, is not simultaneously claimed by different levels of government, this was evidence of large transfers of revenue from the central government to lower levels of government in Germany and Australia.

VI. Total government tax revenue

52. It is tempting to add expenditure of local government to that of central government to obtain an estimate of general government expenditure. Unfortunately, such an exercise would result in a large and varying amount of double-counting, for nowhere are local and central government accounts consolidated. This would mean that a given expenditure on education, for example, might be counted as much as three times — once when the central government transferred funds to the provincial or State level, again when the province transferred the funds to a municipality or school district, and a third time when the school district or municipality actually spent the money.

53. Tax revenue is not affected by this lack of consolidation of accounts, for different levels of government do not claim the same revenue, provided it is revenue from taxation and not revenue from intergovernmental grants. Therefore, adding together the taxes collected by different levels of government can provide a reasonable estimate of the total taxes collected by government.

54. The results of this exercise, showing total tax revenue as a percentage of GDP, are reported in appendix table A10. There were 56 countries with entries for one or more years in the period 1990-1995 and 53 countries in the period 1996-2001. By taking the simple average for each period, for each country, the median ratio was obtained and is shown in table 9 to have been 31.9 in the first period and 33.8 in the second. One cannot, however, conclude that the median tax/GDP ratio increased, for the size and composition of each sample was different. In fact, there were only 48 countries with observations in both periods. Restricting the analysis to these 48 countries, there was almost no change in the tax revenue, the median value of which was 33.5 per cent of GDP in 1990-1995 and 33.8 per cent of GDP in 1996-2001. A second way to approach analysis of these data is to determine the number of countries in which the tax/GDP ratio went up and the number in which it went down between the two periods. It turns out that the number of countries in which the ratio went up was greater than the number in which it went down (28 versus 20), although the difference in size of the two groups was modest. A third approach is to examine the now familiar box plots in figure X. These also show some tendency of tax revenue to rise, with the increase having come from the bottom of the distribution rather than the top. We can conclude, then, that for this sample of 48 countries, there was evidence of a modest increase in the ratio of general government tax revenue to GDP.

55. For two of the three groups of countries — developed and transitional — the direction of change was much stronger. Between 1990-1995 and 1996-2001, taxes collected by all levels of government as a share of GDP increased sharply in developed countries (from a median of 38 to 40 per cent of GDP) and decreased even more sharply in transitional economies (from 35 of GDP to 31 per cent of GDP). Further evidence is offered by the fact that 18 of the 21 developed countries recorded a rise in average tax ratios whereas 12 of the 14 transitional economies recorded a fall. The box plots of figures XI and XII show a similar picture. For the 13 developing countries, however, there was only a very slight increase in tax ratios, from a median of 18.7 per cent of GDP in the first period to 19.2 per cent in the second. Similarly, 8 of the 13 countries registered an increase in tax ratios whereas 5 registered a decrease. The box plots of figure XIII show also a small upward drift of both the box (the middle two quartiles of the distribution) and the whisker (the entire range of observations).

Table 9
Total government tax revenue[a] as a percentage of GDP in domestic prices, various country groups, 1990-1995 and 1996-2001
(Median value of simple averages)

	1990-1995		*1996-2001*		*Direction of change*	
	Number of countries	*Median*	*Number of countries*	*Median*	*Down*	*Up*
Separate samples	56	31.9	53	33.8		
Combined sample	48	33.5	48	33.8	20	28
Developed countries	21	37.8	21	40.1	3	18
Transitional economies	14	34.7	14	31.4	12	2
Developing countries	13	18.7	13	19.2	5	8

Source: Appendix table A10.
[a] Sum of local plus central government tax revenue.

Figure X
Full sample: ratio of total government tax revenue to GDP, 48 countries, 1990-1995 and 1996-2001
(Percentage)

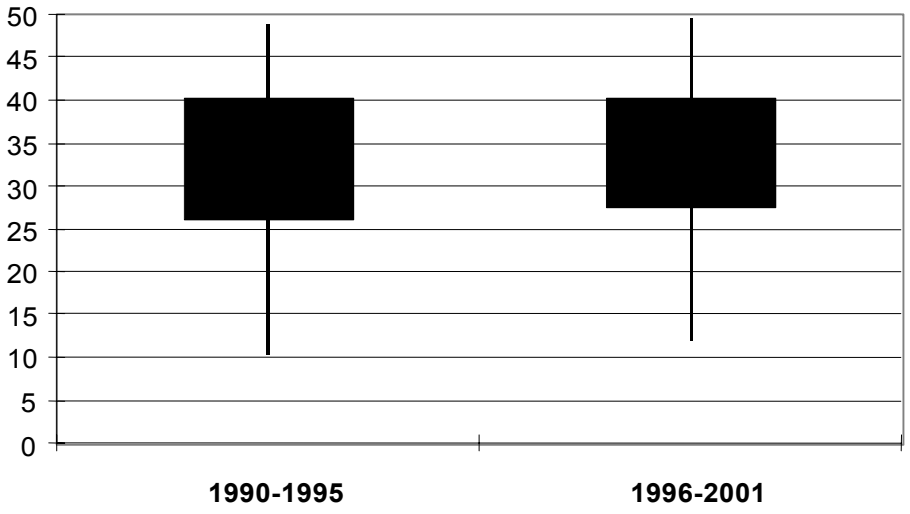


Figure XI

Developed countries: ratio of total government tax revenue to GDP, 21 countries, 1990-1995 and 1996-2001

(Percentage)

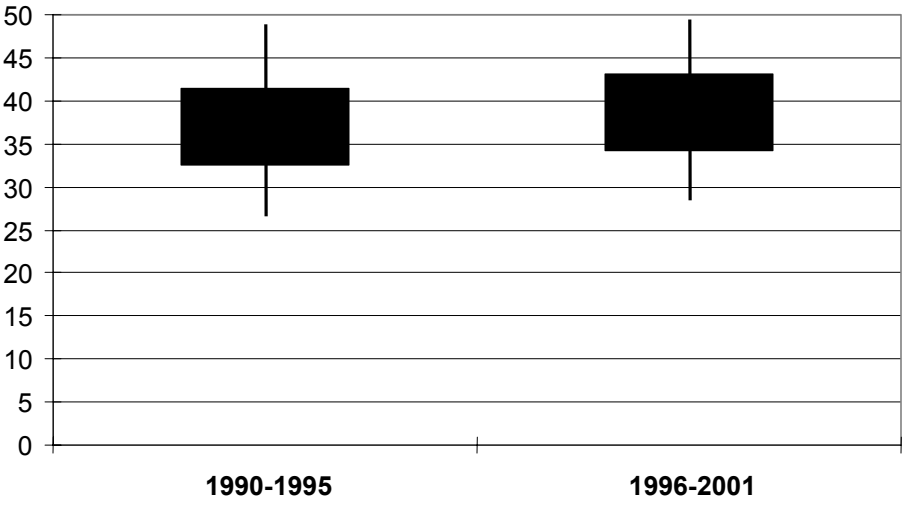


Figure XII

Transitional economies: ratio of total government tax revenue to GDP, 14 countries, 1990-1995 and 1996-2001

(Percentage)

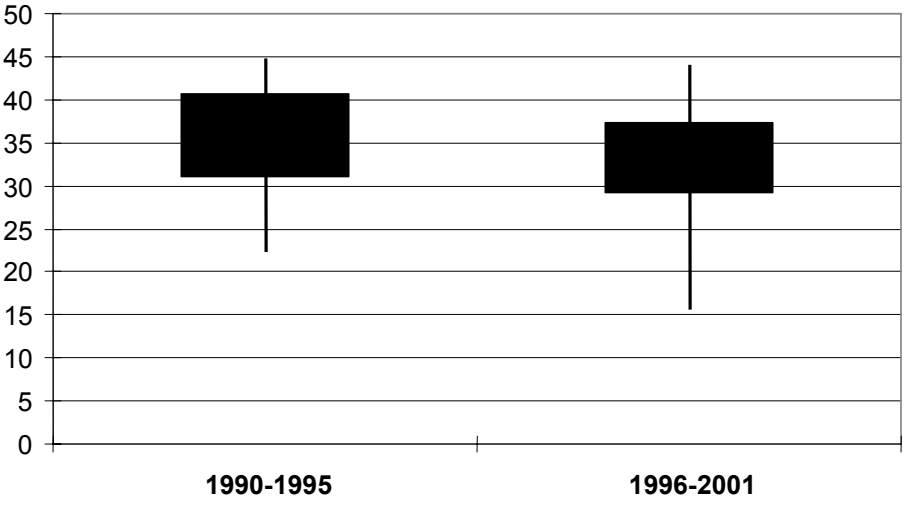
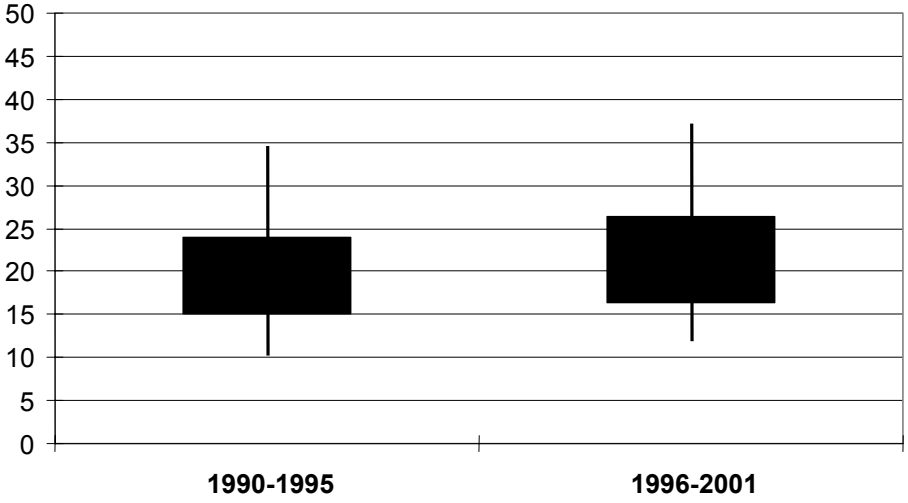


Figure XIII
Developing countries: ratio of total government tax revenue to GDP, 13 countries, 1990-1995 and 1996-2001
(Percentage)



VI. Recommendations

56. **Given the absence of consolidated general government accounts everywhere and, especially, the lack of any accounts at all for lower levels of government in most developing countries, priority should be given to their compilation. Accounts of general government expenditure by function would be particularly useful, for they are essential to analysis of the efficiency and efficacy of government expenditure. Once a country compiles such accounts, it can focus attention on remaining problems such as quantification of tax expenditures, estimates of the quasi-fiscal impact of regulation and trade restrictions, and the moving of public sector accounting from a cash to an accrual basis.**

57. **In the meantime, it is recommended that the Secretariat continue to update, on a timely basis, each of the following indicators:**

- **Government consumption.**
- **Central government expenditure.**
- **Central government tax revenue.**
- **Local government expenditure and taxation.**
- **Total government tax revenue.**
- **Consolidated government expenditure, as data become available.**

Notes

[1] This definition of government follows the *System of National Accounts 1993* (United Nations publication, Sales No. E.94.XVII.4).

[2] United Nations publication, Sales No. E.01.II.H.2.

[3] Alan Heston, Robert Summers and Bettina Aten, *Penn World Table Version 6.1*, Center for International Comparisons at the University of Pennsylvania (CICUP), October 2002.

[4] Accrual accounting is standard in the private sector, whereas cash accounting is the norm in government finance. Cash accounting seriously underestimates the wages paid to teachers and other civil servants if, as is common, a considerable portion of their wages are deferred and paid in the form of unfunded after-service pensions. However, we leave discussion of this problem for a future report on government finance.

[5] "Collective consumption" would have been a more descriptive label.

[6] According to the 1993 SNA, "(W)hereas the recipients of current cash transfers may dispose of them as they wish, the recipients of social transfers in kind have little or no choice" (para. 8.100). Note, however, that the SNA does not allow for the fact that social transfers are fungible. Recipients of free schooling, for example, would presumably spend at least part of their income on schooling were it not provided by government, so government expenditures on schooling ultimately finance households savings and consumption of other goods and services.

[7] See *World Comparisons of Real Gross Domestic Product and Purchasing Power, 1985: Phase V of the International Comparison Programme*, Series F, No. 64 (United Nations publication, Sales No. E.94.XVII.7 and Corr.1).

[8] See Robert Summers and Alan Heston, "The Penn World Table (Mark 5): an expanded set of international comparisons, 1950-1988", *Quarterly Journal of Economics*, vol. 106, No. 2 (May 1991), pp. 327-368. The current version (6.1) was released in October 2002 and can be downloaded from the Center for International Comparisons at the University of Pennsylvania (http://pwt.econ.upenn.edu) or accessed online at Computing in the Humanities and Social Sciences, University of Toronto (http://datacentre2.chass.utoronto.ca/pwt).

[9] A careful reader of table A1 will note that in the numeraire country (United States), the relative price of government consumption exceeds unity by more than 20 per cent. This is possible because price levels in the Penn World Table are expressed relative to the world rather than relative to the United States. Thus, relative price indexes for components of GDP for the United States differ from unity, even though the price index for its overall GDP is unity by definition.

[10] United States Congressional Budget Office, *The Tax Treatment of Employment-Based Health Insurance* (Washington, D.C., March 1994); and Melissa A. Thomasson, "The importance of group coverage: how tax policy shaped U.S. health insurance", *American Economic Review*, vol. 93, No. 4 (September 2003), pp. 1373-1384.

Appendix tables[a]

A1. Government consumption as a percentage of GDP

A2. Central government expenditure as a percentage of GDP

A3. Central government expenditure: distribution by function (percentage of total expenditure)

A4. Central government tax revenue as a percentage of GDP

A5. Central government tax revenue by type of tax (percentage of total tax revenue)

A6. Ratio of local to central government expenditure (percentage)

A7. Ratio of local to central government expenditure on education (percentage)

A8. Ratio of local to central government expenditure on health care (percentage)

A9. Ratio of local to central government tax revenue (percentage)

A10. Total government tax revenue as a percentage of GDP

[a] Available at www.unpan.org/statistical_database-publicsector.asp. Accessed on 3 March 2004.