



# IMF Working Paper

---

ARCHIVES  
ROOM HQ C-532

0441

## Income Distribution and Tax and Government Social Spending Policies in Developing Countries

*Ke-young Chu, Hamid Davoodi, and  
Sanjeev Gupta*



## IMF Working Paper

Fiscal Affairs Department

### Income Distribution and Tax and Government Social Spending Policies in Developing Countries

Prepared by Ke-young Chu, Hamid Davoodi, and Sanjeev Gupta<sup>1</sup>

March 2000

#### Abstract

The views expressed in this Working Paper are those of the author(s) and do not necessarily represent those of the IMF or IMF policy. Working Papers describe research in progress by the author(s) and are published to elicit comments and to further debate.

This paper reviews income distribution in developing (and transition) countries in recent decades. On average, before-tax income distribution in developing countries is less unequal than in industrial countries. However, unlike industrial countries, developing countries in general have not been able to use tax and transfer policies effectively to reduce income inequality. During the 1980s and 1990s, many developing countries experienced an increase in income inequality. The government health care and primary and secondary education programs in developing countries are not well targeted, but their incidence tends to be progressive.

JEL Classification Numbers: D31, H22, H53

Keywords: Income distribution, tax incidence, government social spending

Author's E-Mail Address: [kchu@imf.org](mailto:kchu@imf.org), [hdavoodi@imf.org](mailto:hdavoodi@imf.org), [sgupta@imf.org](mailto:sgupta@imf.org)

---

<sup>1</sup> The authors wish to thank Vito Tanzi, Michael Keen, John Norregaard, Gustavo Yamada, and Chi-Wa Yuen for helpful comments, and Randa Sab and Erwin Tiongson for efficient research assistance. An earlier version of this paper was presented at a World Institute for Development Economics Research conference on "Rising Income Inequality and Poverty Reduction: Are They Compatible?" held in Helsinki, Finland, July 16–18, 1999. The paper will be published in the conference proceedings. The authors are thankful to Giovanni Andrea Cornia for comments and suggestions on an earlier draft.

	Page
I. Introduction.....	3
II. Overview of the Changes in Income Distribution.....	4
A. Income Distribution in the 1990s .....	4
B. Changes in Income Distribution, 1970s–1990s.....	8
III. Role of Taxes and Social Spending.....	10
A. Selective Literature Survey .....	10
B. Changes in Income Distribution, 1970s–1990s.....	18
C. Econometric Estimation of Gini Equations.....	22
D. Role of Taxes and Government Social Spending Policy .....	25
IV. Summary and Conclusions .....	34

#### Tables

1. Twenty Developing (and Transition) Countries: Income Distribution, 1990s .....	6
2. Income Distribution in Industrial Countries, 1970s/80s–1990s.....	7
3. Developing Countries: Overview of Income Distribution and Tax Burden/Structure, 1060s–1990s .....	9
4. Developing Countries: Tax Incidence .....	14
5. Developing Countries: Incidence of Selective Social Expenditures .....	16
6. Nineteen Developing Countries: Income Distribution, 1970s–1980s.....	20
7. Ten Developing Countries: Changes in Income Distribution, 1980s–1990s.....	21
8. Developing Countries: Estimation of Gini Equations .....	24
9. Nineteen Developing Countries: Changes in Tax Structure, 1970s–1980s.....	27
10. Ten Developing Countries: Changes in Tax Burden/Structure, 1980s–1990s .....	29
11. Selected Developing Countries: Changes in Gini Coefficient, Tax Structure, and Secondary School Enrolment .....	31

#### Annex Tables

12. Tax Incidence Studies, 1975–1998: Summary of Characteristics .....	38
References .....	41

## I. INTRODUCTION

For many developing countries, widespread poverty and the small income share of the poor have been a source of particular concern. Increasing international economic interdependence, uncertainties arising from this interdependence, and some evidence of widening income disparities in recent decades have further heightened the economic profession's interest in income distribution, its changes, and the underlying factors.

The evidence of widening income disparities also has heightened the economic profession's interest in the role of fiscal policy as a redistributive instrument in the short run and in the long run, as well as in the progressivity (or the lack) of tax and transfer policies. At the same time, questions have been raised on the effectiveness of tax and transfer policies as a redistributive tool.

Assigning a more activist role to tax and transfer policies in developing (and transition) countries often gives rise to many challenges. The interaction between the progressivity of tax and transfer policies and income distribution is complicated by a set of factors that are unique to *developing (and transition) countries*, which, in general, have a number of weak fiscal features: a low tax-to-GDP ratio, reflecting poor governance, weak tax administration, and widespread tax evasion; the predominance of indirect taxes and a limited menu of capital and wealth taxes; and a limited role of formal cash transfer and social protection policies.<sup>2</sup> These features cast doubt on the ability of tax policy to redistribute income.<sup>3</sup>

Noting that the poor rarely pay income taxes in many developing countries and that *education and health spending and other in-kind transfers* account for a large share of the budget, many have argued that the expenditure side of the budget should be a primary redistributive tool (Tanzi, 1974 and 1998; Harberger, 1998). The major contribution of tax policy as a redistributive instrument should be to raise the revenues needed to finance efficient pro-poor and other essential government expenditures, and to avoid generating horizontal inequities. To this end, tax systems should have broad bases, limited exemptions, and low rates. This view has formed a basis for an agreement among many researchers and policymakers on the relative role of tax and expenditure policies in income redistribution in developing (and transition) countries.

As regards income distribution and the role of fiscal and other economic policies in developing (and transition) countries, a number of questions arise: How do these countries differ in income distribution—both among themselves and from industrial countries? Is

---

<sup>2</sup>Alesina (1999) discusses the role of poor governance and the vicious cycle of low tax-to-GDP ratio and tax evasion.

<sup>3</sup>See Tanzi (1998), who notes these and other practical problems involved in administering a progressive tax system in developing countries.

income distribution in these countries becoming more unequal? What is the redistributive role of tax, transfer, and other expenditure policies?

Unfortunately, the limited availability of high-quality data for developing countries prevents a rigorous analysis of these questions. While numerous studies have focused on income distribution in individual countries and, to some extent, on international comparison of income distribution, scarce high-quality data have limited studies of long-term changes in, and international comparison of, income distribution in developing countries.

This paper provides an overview of the changes in income distribution in developing (and transition) countries in recent decades, and assesses the incidence of taxes and government expenditures in these countries. For the overview of income distribution, this paper relies on a set of *newly available "high-quality" income distribution data*.<sup>4</sup> For the assessment of tax and government expenditure incidence, it relies on *existing incidence studies on individual countries*.

This paper is organized as follows. Section II provides an overview of the changes in income distribution in developing countries in recent decades. The sample countries include several transition countries. Section III provides a survey of the studies on the incidence of taxes and expenditures, paying a particular attention to the incidence of government spending on education and health, reviewing the available evidence for a large number of developing countries. Section III also offers an analysis of the changes in income distribution in developing countries from the 1970s through the 1990s and discusses possible underlying factors, including the role of tax policy. Section IV concludes the paper.

## II. OVERVIEW OF THE CHANGES IN INCOME DISTRIBUTION

### A. Income Distribution in the 1990s

As indicated later in this paper, the analysis of income distribution and distributional implications of taxes and government spending is subject to many conceptual and practical difficulties. Should *income* or *consumption* be used? How should the *benefit of government spending* be valued?

The difficulties are particularly severe for developing (and transition) countries. Income distribution data for these countries are expanding, but still are not adequate. Internationally comparable data on before-tax *and* after-tax household incomes for some countries are virtually nonexistent. The available data do not allow an assessment of the long-term evolution of income distribution for *a large number* of developing countries.

---

<sup>4</sup>Deininger and Squire (1996).

Table 1 is based on the high-quality data compiled by Deininger and Squire (1996). Estimates of before-tax and after-tax Gini coefficients and quintile income shares in the 1990s are available only for 20 developing (and transition) countries. In general, these estimates are based on household incomes including government cash transfers. For a considerable number of countries, however, the estimates are based on consumption data. Unlike the income data used for tax or expenditure incidence studies in individual countries, the Deininger and Squire data have been compiled on the basis of a *common* methodology and are *intertemporally* and *internationally comparable*. For the 9 “b” countries, estimates are based on before-tax (but after-transfer) incomes; for the 13 “a” countries, estimates are based on after-tax (and after transfer) incomes (or consumption). However, even these data do not include both before-tax *and* after-tax household incomes, ruling out the possibility of using the data for explicitly assessing the role of tax and transfer policies in the changes in income distribution; for only two countries (Poland and Romania) are estimates available on the basis of both before-tax and after-tax incomes, but for different years.

Subject to the above caveats, after-tax Gini coefficients, on average, are lower than before-tax Gini coefficients, and have a smaller range as well. For the 9 “b” countries, for which inequality estimates are based on *before-tax incomes*, Gini coefficients range widely, between 25 percent and 52 percent, averaging 38 percent; by contrast, for the 13 “a” countries for which inequality estimates are based on *after-tax* incomes, Gini coefficients range between 25 and 45 percent, averaging 34 percent. The difference of 4 percentage points between the two averages *does not* necessarily suggest the redistributive impact of taxes. First of all, the two samples comprise two different sets of countries. Moreover, the before-tax incomes are likely to reflect the impact of tax policy. It is interesting, however, that the small difference between the averages is similar in its magnitude to the differences of 3 and 4 percentage points between before-tax and after-tax Gini coefficients for Poland and Romania—the only two countries for which both before-tax and after-tax income data are available.<sup>5</sup>

By comparison with *industrial countries*, before-tax (after-transfer) Gini coefficients for developing countries are smaller, on average, but more widely dispersed. The before-tax Gini coefficients for the 9 developing countries in Table 1 average 38 percent, compared with the average of 44 percent for the before-tax and before-transfer “market-income” Gini coefficients for 11 industrial countries in Table 2.<sup>6</sup> The before-tax Gini coefficients for

---

<sup>5</sup>The income shares of the poorest quintile range between 4 percent and 11 percent for the “b” countries, and between 5 percent and 9 percent for the “a” countries. The ratios between the income shares of the richest and poorest quintiles range between 3 and 16 for the former countries and 4 and 10 for the latter. Gini coefficients, in general, are low for transition countries (e.g., Czechoslovakia, Romania, Yugoslavia, Poland, and Bulgaria).

<sup>6</sup>The Gini measure of income inequality as reported in the OECD (1999) accounts for the economies of scale of household consumption, whereas the measure in Deininger and Squire (1996) does not. The OECD data might better capture capital incomes and the incomes of self-employed persons than the Deininger and Squire data on developing countries.

Table 1. Twenty Developing (and Transition) Countries: Income Distribution, 1990s 1/

	Gini	Adj. Gini	Shares Q1 Q5 (In percent)		Ratio Q5/Q1		Per Capita GNP \$ 1992	Income Level
<b>Before tax ("b") countries</b>								
Median	34	30	6	42	6		1,585	
Mean	38	34	7	44	8		3,228	
Czechoslovakia *	25	21	11	36	3	eq	2,450	
Romania *	29	25	9	37	4	eq	1,130	
Yugoslavia *	32	28	7	39	5	eq		
Poland *	33	29	6	39	6	eq	1,910	
Bulgaria *	34	30	7	42	6		1,330	
China *	38	34	6	42	7		470	li
Hong Kong, China	45	41	5	49	10	ueq	15,360	hi
Colombia	51	47	4	54	15	ueq	1,330	
Thailand	52	48	4	59	16	ueq	1,840	
<b>After tax ("a") countries</b>								
Median	32		7	41	5		1,035	
Mean	34		8	42	6		1,198	
Romania *	25		9	35	4	eq	1,130	
Poland *	29		8	38	4	eq	1,910	
Sri Lanka	30		9	39	4		540	li
Taiwan	31		7	39	5			hi
Pakistan	31		8	40	5		420	li
India	32		9	41	5		310	li
Hungary *	32		7	39	6		2,970	
Indonesia	33		9	42	5		670	li
Mauritius	37		7	43	6		2,700	
Jamaica	38		7	45	7		1,340	
Jordan	41		6	48	7	ueq	1,120	
Nigeria	41		7	48	7	ueq	320	li
Peru	45		5	50	10	ueq	950	

Sources: Deininger and Squire (1996); International Monetary Fund, *International Financial Statistics Government Finance Statistics*, and World Bank's *World Development Report*, 1994.

\* denotes transition countries.

eq = relatively equal income distribution (after-tax Gini smaller than 30); Adj. Gini = "b" Gini - 4.

ueq = relatively unequal income distribution (after-tax Gini greater than 40).

hi = high-income country; li = low-income country (per capita GNP less than \$670).

Q1 = poorest quintile; Q5 = richest quintile

1/ Each entry in the table corresponds to the latest available observation in the 1990s for each country; Discrepancies are due to rounding errors.

Table 2. Income Distribution in Industrial Countries, 1970s/80s-1990s

(In percent)

Countries	Period	Gini		Period	Percent Change in Gini	
		Market Income	Disposable Income 1/		Market Income	Disposable Income
Average Gini (1990s)		44.3	27.7		15.7	5.0
Average Gini (1970s/80s)		40.4	26.4			
Percentage-Point Change in Gini (1970s/80s-1990s)					3.9	1.3
Australia	1993/94	46.3	30.6	1975-94	36.6	5.2
Belgium	1995	54.5	29.6	1983-95	...	2.3
Canada	1994	...	28.4	1975-94	...	0.2
Denmark	1994	42.0	21.7	1983-94	11.2	-4.9
Finland	1995	39.2	23.1	1986-95	11.4	9.1
France	1990	...	29.1	1979-90	...	-1.7
Germany	1994	43.6	28.2	1984-94	1.2	6.4
Italy	1993	51.0	34.5	1984-93	20.8	12.7
Japan	1994	34.0	26.5	1984-94	...	4.9
Netherlands	1994	42.1	25.3	1977-94	14.2	11.8
Norway	1995	39.9	25.6	1986-95	...	9.4
Sweden	1995	48.7	23.0	1975-95	17.3	-1.0
United States	1995	45.5	34.4	1974-95	13.1	10.0

Sources: OECD, 1997, *OECD Economic Outlook*, No. 62 (December): 49-59; Oxley, Burniaux, Dang and d'Ercole (1999, Tables 1, and A1).

1/ Disposable income is defined as sum of 1) earnings, 2) self employment and capital income, 3) transfers received from general government, and 4) direct taxes and social security contributions paid by individuals.

developing countries range between 25 percent and 52 percent, whereas the market-income Gini coefficients for industrial countries range between 34 percent and 54 percent. However, tax (and transfer) policies in industrial countries reduce their Gini coefficients much more than their counterparts in developing countries. For the 11 industrial countries, the average disposable income Gini coefficient is lower than the market income Gini coefficient by 16 percentage points and lower than after-tax Gini coefficient for developing countries by 6 percentage points.

### B. Changes in Income Distribution, 1970s–1990s

Table 3 provides an overview of the *changes* in income (or consumption) distribution for groups of countries for which data on (1) *either* before-tax or after-tax Gini coefficients and (2) tax structures are available for recent decades (1970s–1990s). For changes in Gini coefficients from the 1970s to the 1980s, consistent data are available for only 19 countries. For changes from the 1980s to the 1990s, data are available for 10 countries.

The average Gini coefficient for the sample countries was *stable* during the 1970s–1980s. The average remained at 44 percent for the 19 countries. The average Gini coefficient for the 10 sample countries increased only slightly, from 32 percent to 34 percent, during the 1980s–1990s.

The stable *average* Gini coefficient during the 1970s and the 1980s, however, masks *considerable changes* in the coefficients for some countries. For example, during the 1970s–1980s, the Gini coefficient for Thailand increased by four percentage points, while the Gini coefficient for Turkey declined by seven percentage points. During the 1980s–1990s, Thailand and two transition countries (Bulgaria and Hungary) experienced a large increase in the Gini coefficient (see Section III for further discussion).

It is well recognized that transition countries have experienced an increase in the degree of inequality in the size distribution of income. It is not immediately clear, however, why Gini coefficients for a large number of developing countries increased precipitously during the 1980s–1990s.

On the basis of the averages, data are not clear about the distributive role of taxes. From the 1970s to the 1980s, the tax burden, on average, increased slightly, with no notable change in the composition of direct and indirect taxes. From the 1980s to the 1990s, neither the average tax burden, nor the tax composition changed significantly.

Table 3. Developing Countries: Overview of Income Distribution and Tax Burden/Structure, 1960s-1990s

(In percent unless otherwise indicated)

	1970s		1980s		1990s				
	Gini (percent)	Q5/Q1 Ratio	Gini (percent)	Q5/Q1 Ratio	Gini (percent)	Q5/Q1 Ratio			
<b>Income distribution</b>									
1970s-80s									
All countries	44	12	44	11					
15 "b" countries	46	13	46	12					
4 "a" countries	36	7	36	7					
<b>Tax burden/structure (percent of GDP)</b>									
1970s-80s									
	Total Tax	Direct Taxes	Indirect Taxes	Total Tax	Direct Taxes	Indirect Taxes			
All countries	14	6	7	16	7	8			
15 "b" countries	15	6	7	16	7	8			
4 "a" countries	14	5	8	16	6	9			
<b>Income distribution 1/</b>									
1980s-90s									
All countries				32	7	34	8		
5 "b" countries				31	8	33	9		
5 "a" countries				35	6	37	7		
<b>Tax burden/structure (percent of GDP) 1/</b>									
1980s-90s									
				Total Tax	Direct Taxes	Indirect Taxes	Total Tax	Direct Taxes	Indirect Taxes
All countries				22	5	12	21	5	11
5 "b" countries				24	7	11	21	6	11
5 "a" countries				20	4	13	20	4	12

Sources: Tables 6, 7, 9, 10, and International Monetary Fund, *International Financial Statistics and Government Finance Statistics* data base.

b = Gini coefficient and Q1 and Q5 estimates based on before-tax incomes.

a = Gini coefficient and Q1 and Q5 estimates based on after-tax incomes.

### III. ROLE OF TAXES AND SOCIAL SPENDING

Income distribution has many aspects. The distribution of *market incomes* is an important aspect of income distribution. The distribution of *disposable incomes* is another. One could also look at the distribution of *disposable incomes* together with *government in-kind transfers*, such as education and health services. More broadly, one could analyze the distribution of *disposable incomes and all government services*, including defense, justice, and infrastructure services. In a country with a large-scale provision of free public education and health care, this last measure of income distribution could be substantially different from that of disposable incomes. Even in a country where markets play a dominant role, the distribution of income based on the first and last measures could be substantially different.

There are many factors that affect the distributions of market and disposable incomes. These factors include the distribution of physical, financial, and human capital; rates of returns to these forms of capital; and formal and informal institutions. Taxes and transfers affect the difference between market and disposable incomes in the short run, but they can also affect the distribution of market incomes over time. Some taxes can affect individuals' work efforts. Excessively high tax rates can drive economic activities out of the formal sector or out of a country. Government social spending policies have distributional implications not only because social spending can offer immediate benefits (e.g., health and education services), but they also affect the distribution of earning capacities of individuals and households, and thus help shape the distribution of market incomes over time. Some social expenditures (e.g., expenditures on primary schooling) can affect income distribution with a long time lag.

This section traces the distributional implications of tax and social spending policies through some of these diverse channels. Section A provides an overview of the literature on how taxes and social expenditures are distributed among different income groups. Section B discusses how income distribution, measured on the basis of before-tax or after-tax incomes, has changed in recent decades. Section C uses econometric techniques to detect any long-term relationship between the distribution of either before-tax or after-tax incomes and certain aspects of tax and social spending policies (i.e., tax structure and secondary enrolment rate). Section D discusses the relationship between income distribution and taxes and government social spending policies in selected countries.

#### A. Selective Literature Survey

##### Existing surveys of tax incidence studies

This section discusses five surveys of tax incidence studies of developing countries: Bird and de Wulf (1973); De Wulf (1975); and subsequent surveys by McLure (1977) and Shah and Whalley (1990 and 1991).<sup>7</sup>

---

<sup>7</sup>Any study of tax incidence confronts problems, including the coverage of incomes and taxes, assumptions about the shifting of the tax burden and its measurement, estimation of *counterfactual* before-tax income

(continued...)

Bird and de Wulf (1973), covering 29 studies on 17 Latin American countries, conclude that tax systems in these countries were often *ineffective* as redistributive tools. Bird and De Wulf note that only 4 of 29 studies suggest a mild redistributive impact of the tax system, whereas the remaining studies suggest “rough proportionality or even regressivity over most income classes” (Bird and De Wulf, 1973, p. 671).<sup>8</sup> Although de Wulf (1975), in a subsequent survey of 66 studies covering 23 countries, concludes that the tax system in developing countries tends to be *progressive* (and the degree of progressivity varies from steep to moderate), he reverses himself in a subsequent survey by noting that it is “difficult...not to conclude that tax systems in LDCs must be *regressive*” (de Wulf, 1981, p. 20). Underlying his reasoning is the relative dominance of consumption taxes, which he assumes to be mostly regressive.

McLure (1977), in a survey of seven studies on the tax burden faced by the urban poor in developing countries, notes that tax rates for urban households are *progressive* but not smooth. For example, although the effective tax rates for the urban rich (top 2–5 percent of urban households) are at least twice those of the urban poor (bottom 40 percent of urban households), the fourth urban quintile and the urban poor face similar effective tax rates. He concludes that, because policy decisions are made at the margin, a tax incidence analysis would be more useful to policymakers if it focused on the distributional implications of *changes* in tax systems rather than on the incidence of an existing tax system.

Shah and Whalley (1990 and 1991), in a brief survey of seven tax incidence studies, conclude that, with some exceptions, the overall tax system is broadly progressive. Regarding individual taxes, they find excises, personal income taxes, and urban property taxes to be progressive; sales and import duties to be regressive; corporate taxes to vary, depending on assumptions used; and general indirect taxes to have a U-shaped incidence pattern.<sup>9</sup>

### **Recent tax incidence studies**

Some methodological improvements in measuring the incidence of taxes have been made since the surveys by Bird and de Wulf (1973) and de Wulf (1975). Fully-specified

---

distribution, behavioral responses of individuals, and the time horizon of the analysis. These problems make cross-country comparisons of tax incidence and even intertemporal within-country comparisons difficult, and more so when a country's major tax reform has made the task of reaching a firm conclusion regarding tax incidence difficult.

<sup>8</sup>These conclusions are based primarily on the calculation (and visual inspection) of average effective tax rates by income class whenever reported in a study and some notion of departures from proportionality.

<sup>9</sup>These conclusions are based on studies that rely on a standard tax incidence analysis with shifting assumptions that in general determine the outcome of the incidence studies. Typically, personal income taxes and payroll taxes are assumed to be borne by the taxed income recipient, whereas indirect taxes are assumed to be shifted forward to consumers of taxed commodities. Incidence of corporate taxes is controversial, however. In an earlier study, Whalley (1984) shows how a tax system can be made to appear sharply progressive or sharply regressive by changing a number of shifting assumptions.

computable general equilibrium models have gradually replaced various (forward or backward) shifting assumptions featured in a large number of studies surveyed by Bird and de Wulf (1973) and Shah and Whalley (1990 and 1991), although in some cases the results of judgmental studies were close to general equilibrium simulations (Devarajan, Fullerton, and Musgrave, 1980).

General equilibrium analysis seems to add an interesting dimension that was absent in partial equilibrium studies. For example, personal and company taxes in Kenya are found to be progressive on the basis of a general equilibrium analysis (Mwega, 1986), but to be regressive on the basis of a partial equilibrium analysis (Westlake, 1973). Similarly, indirect taxes in the Philippines are found to be broadly neutral, but only after taking into account their general equilibrium effects (Devarajan and Hossein, 1998).

Mostly, however, tax incidence studies still visually inspect the effective tax rates by income group and present a judgment of the degree of progressivity. Certain methodological difficulties, dating back to the surveys of Bird and De Wulf (1973), continue to persist. For example, income concepts used in incidence studies continue to vary widely, from taxable income (Chowdhury, 1988) and gross income (Bolkowiak and others, 1996), to permanent income (Gil-Diaz, 1982). In addition, there are significant differences in taxes studied, units of analysis, and underlying assumptions.

For a better understanding of the state of knowledge on the incidence of taxes in developing countries, this paper offers the results of a systematic survey of all tax incidence studies conducted since the surveys of Bird and De Wulf (1973) and De Wulf (1975). The intention of the survey is to record the following crucial features for each study: the country and period covered, concept of income used, taxes included, unit of analysis (e.g., individuals or households), coverage (e.g., all individuals, wage earners, or pensioners), measure of tax progressivity, and the study's conclusion about the tax incidence.

Table 4 suggests the following points:

- As regards *overall tax systems* or both direct and indirect taxes in 19 countries studied, only 13 of 36 cases are *progressive*, 7 are proportional, 7 are regressive, and the rest have mixed findings or insignificant effects.
- As regards *income tax systems* in 8 countries, 12 of the 14 cases are *progressive*, one is regressive, and one has mixed findings. In the 5 cases of payroll taxes in 3 countries, 3 cases are regressive, and 2 cases have insignificant effects.
- Eight studies report a *decline* of the progressivity of direct taxes over time.

Some studies, not reported in the table, suggest that indirect taxes may not be as regressive as assumed in the surveys of Bird and De Wulf (1973) and De Wulf (1975).<sup>10</sup>

### **Benefit incidence of government spending**<sup>11</sup>

In an exhaustive survey of some 25 years ago, McLure (1974) defines *expenditure incidence* as “how government spending affects private incomes” and *benefit incidence* as “who receives benefit of government services.”<sup>12</sup> Benefit incidence analysis is meaningful only if they can be interpreted properly, given its limitations.<sup>13</sup> The concepts of targeting and progressivity, commonly used to interpret such data and used in this paper, need to be defined as follows:<sup>14</sup>

- Government spending is considered to be well (poorly) targeted if the poorest quintile’s share of benefits from such spending is larger (smaller) than the richest quintile.<sup>15</sup> This means that the poorest 20 percent benefit more than the richest 20 percent, in absolute terms.

---

<sup>10</sup>For example, VATs have a progressive incidence in four African countries (Sahn and Younger, 1998). Sahn and Young (1998) provide no explanation for this nonconventional finding. See Bird and De Miller (1986); Srinivasan (1989); and Shah and Whalley (1990 and 1991).

<sup>11</sup>This section draws on Davoodi and Sachjapinan (forthcoming).

<sup>12</sup>There are three methods of measuring the incidence of public expenditure: *the individual's own valuation of public goods*, *expenditure incidence analysis*, and *benefit incidence analysis*. The first approach involves eliciting the prices that individuals are willing to pay for public goods (Aaron and McGuire, 1970). This is a demanding task, because of the well-known problems associated with the provision of public goods (e.g., free-riding, non-rivalry). The other two methods attempt to circumvent these problems by making various assumptions about the “ultimate” beneficiaries of publicly financed goods and services. Identification of the “ultimate” beneficiaries of government spending under any of the three approaches is also a problem that is shared with the identification of the tax burden under tax incidence analysis, because benefits of government spending can be shifted just as much as tax burden can.

<sup>13</sup>For example, as Tanzi (1974) points out in the context of Latin America, “... those *benefits* are never allocated. What gets allocated is the cost. But costs may not be any indication of benefits and the fact that two children get the same cost imputed to them tells nothing about the benefits that they will derive from that experience... a child from the urban middle class is more likely to get a great benefit from the same educational spending than one from the rural subsistence sector.”

<sup>14</sup>These definitions are used, among others, by Selden and Wasylenko (1992); and Castro-Leal, Dayton, Demery and Mehra (1999).

<sup>15</sup>For analytical convenience, the poor are assumed to be in the bottom quintile and the rich in the top quintile.

Table 4. Developing Countries: Tax Incidence

Periods Studied	Countries Studied	Taxes Studied				
		All Taxes	Direct Taxes	Income		Indirect Taxes
					Payroll	
Frequency		36	3	14	5	5
	PP	1				
	P	12	1	12		2
	Prop	7	1			1
	Insig	1			2	
	Mixed	8	1	1		2
	R	7			3	
	RR			1		
1971-75	Colombia	PP				
	Mexico	P				
	Korea	Prop				
	Jamaica	Mixed				
	India			P-		
1976-80	Mexico	P				
	Pakistan	P				
	Korea	Prop				
	Korea	R				
	India			P-		
	India					P
1981-85	Korea	Prop				
	Jamaica	Mixed				
	Korea	R				
	India			P-		
	Bangladesh			Mixed		
	Jamaica			RR		
	India					P, Prop
	Jamaica					Prop
1986-90	Jamaica	P				
	Philippines	Prop				
	Philippines	Mixed				
	Korea	R				
	Hungary			P-		
	Hungary				R	
	Poland				R	
	Peru					Mixed ()
1991-95	Guatemala	P				
	Jamaica	Insig				
	Poland		Mixed			
	Bulgaria			P		
	Hungary			P-		
	India			P-		
	Bulgaria				Insig	
	Poland					Mixed

Sources: Calculated from the data in Annex Table 1.  
 PP = Strongly progressive; P = Progressive; P- = Decline in progressivity.  
 Prop = Proportional; Mixed = Mixed.  
 R = Regressive; RR = Strongly regressive; Insig. = Insignificant effect.  
 () = Selective taxes studied.

- Government spending is considered to be progressive (regressive) if the benefits to the poorest quintile are larger (smaller) than the benefits to the richest quintile, *relative* to their income or expenditure. With progressive (regressive) spending, benefits represent a smaller (larger) fraction of income or expenditure at higher income or expenditure quintiles.<sup>16</sup>

These definitions imply that if spending is well targeted, it will be progressive, but progressive spending may not be well targeted. It also implies that if spending is poorly targeted, it may be progressive or regressive. Targeting an expenditure well is a much more demanding objective than making it progressive.

***Benefit incidence of government education spending.*** Thirty-one of the 55 studies for 25 developing countries for which central government spending data are available on “all education” (primary, secondary, and tertiary education) find government educational spending to be progressive (Table 5).<sup>17</sup>

Spending on education, on average, is poorly targeted in 33 studies; there are regional differences, however. Education spending is well targeted in Asia and Latin America, but poorly targeted in sub-Saharan Africa, the Middle East, and transition economies.<sup>18</sup> Sub-Saharan Africa’s record stands out among the latter economies: the poorest quintile receives the least (13 percent of benefits), and the richest quintile receives the most (32 percent of benefits).

- In all regions, government spending on primary education is well targeted, but there are notable differences across the regions. The poorest quintile in sub-Saharan Africa receives from government primary education spending slightly more than the richest quintile, whereas the poorest quintile in Latin America receives more than four times the richest quintile.
- Government secondary education spending, on average, is well targeted in Asia and Latin America but poorly targeted in sub-Saharan Africa, the Middle East, and transition countries.
- Government tertiary education spending mostly benefits the richest quintile in all regions. Sub-Saharan Africa stands out in this respect. The poorest quintile receives 4.5 percent of benefits from government tertiary education spending, whereas the richest quintile receives as much as 59 percent.

---

<sup>16</sup>Note the asymmetry in the definition with that for tax progressivity.

<sup>17</sup>This pattern holds regardless of whether benefits are expressed as percent of income or expenditure.

<sup>18</sup>The coverage of the Middle East is too narrow as Tunisia is the only country with data in this region.

Table 5. Developing Countries: Incidence of Selective Social Expenditures

Frequency: Number of Countries									
Education									
	Targeting				Progressivity				
	All	Pri- mary	Sec- ondary	Ter- tiary	All	Pri- mary	Sec- ondary	Ter- tiary	
Targeting	55	54	54	52					
Good	22	42	23	0					
Poor	33	12	31	52					
Incidence					31	37	26	11	
Progressive					31	37	26	6	
Regressive					0	0	0	5	
Health									
	Targeting				Progressivity				
Targeting	38								
Good	21								
Poor	17								
Incidence					30				
Progressive					30				
Regressive					0				
Transfers									
	Targeting				Progressivity				
Targeting	14								
Good	4								
Poor	9								
Inconclusive	1								
Incidence					15				
Progressive					14				
Regressive					0				
Inconclusive					1				

Sources: Davoodi and Sachjapinan (forthcoming).  
Central government data.

The data compiled by Davoodi and Sachjapinan (1999) also allow an analysis of the changes in benefit incidence *over time*. The available data indicate that the poor's share of the benefits from education spending has increased relative to the richest quintile. Of the 11 countries for which benefit incidence data for education are available, *8 countries show improvements for the poorest quintile while 3 countries show a deterioration.*<sup>19</sup>

***Benefit incidence of government health spending.*** Table 5 indicates that 21 of 38 studies find government health spending to be well targeted, and all 30 available studies find government health spending to be progressive.

Government spending on "all health"<sup>20</sup> (comprising expenditures on health centers, hospitals, and hospital inpatients and outpatients) for a sample of 14 developing countries are progressive over the period 1974–1995 for which data are available.<sup>21</sup> Much like the benefit incidence of government education spending, there is a striking diversity in the degree of progressivity among countries.

- Government spending on health, on average, is well targeted in a sample of 29 developing and transition economies over the period 1978–1995. Sub-Saharan Africa and transition economies are the only areas in which government health spending is poorly targeted. In contrast, the poorest quintiles in Asia and Latin America receive, respectively, 1.5 and 3 times as much in benefits as the richest quintiles.<sup>22</sup>
- Benefit incidence of health spending has changed *over time*. Of the 10 countries for which data at two points in time are available for health spending, the poorest quintile's share of benefits *has increased relative to the rich in five countries but has decreased in another five*. Similarly, changes in incidence for subcategories of health spending do not follow a uniform pattern.

---

<sup>19</sup>Using the two latest incidence data for each country, changes in benefit incidence are measured as changes in the ratio of Q1 to Q5, where Q1 and Q5 have been defined previously. As for categories of education, there are more countries showing improvements than deterioration for government primary education and tertiary education spending, but there are as many cases of improvement as deterioration for government secondary education spending.

<sup>20</sup>Unlike education, which has three well-defined subcategories, health spending is disaggregated into many categories. The findings here are based on a pattern of health disaggregation that is frequently found among the countries surveyed.

<sup>21</sup>This pattern holds regardless of whether benefits are expressed as percent of income or expenditure.

<sup>22</sup>Spending on each subcategory of health spending is, on average, well targeted except for spending on hospital outpatients. Sub-Saharan Africa and transition countries are the only regions in which each subcategory of health spending is poorly targeted, thus mirroring the pattern observed at the level of total health expenditure.

**Benefit incidence: other government expenditures.** Table 5 offers a summary of the results for selected transfers. As in the case of "other government expenditures," transfers are not well targeted in many countries.

Not surprisingly, the well-targeted programs include a number of expenditure items that involve some targeting mechanism, such as food stamps (Jamaica) or self-targeted food subsidies (Tunisia). In Sri Lanka's (Edirisinghe, 1987), although both universal and targeted programs are found to be progressive, the food stamp program in fact resulted in a greater degree of progressivity and a better targeting. Universal food subsidies in the sample are poorly targeted, with upper-income quintiles obtaining more benefits in absolute terms (e.g., Tunisia).

A number of housing expenditures are poorly targeted (four of six cases), as well as pension and social security benefits (Chile, Costa Rica, and Uruguay). However, a better targeting is sometimes achieved when pensions are combined with pro-poor family allowances and other benefits (see e.g., Milanovic, 1995). Meanwhile, residential utilities are often poorly targeted, except for new investments in Colombia from 1970–74.

A limited number of studies allow for meaningful comparisons *over time*. They generally show that there has been some improvement in progressivity and targeting over time. For example, in Chile (Aninat, Bauer, and Cowan, 1999), the share of cash transfers received by the poorest quintile increased from 33 percent in 1992 to 40 percent in 1996. The redistributive impact of cash transfers, along with social spending, was seen to have compensated for some deterioration in the distribution of income during this period. In Colombia, pro-poor investments from 1970–74 resulted in a larger percentage of households in the poorest quintile with access to public utility services (electricity, water and sewage, and street lighting). In Costa Rica, the share of pension benefits received by the poorest quintile increased from 6 percent in 1986 to 9 percent in 1992, although this is still somewhat lower than their 1983 share (10 percent).

## **B. Changes in Income Distribution, 1970s–1990s**

### **Changes from the 1970s to the 1980s**

For the period 1970s–1980s, consistent income distribution data are available only for 19 developing countries: before-tax (but after-transfer) income data for 15 countries ("b" countries), and after-tax (and after-transfer) income data for only 4 countries ("a" countries). During the 1970s, Gini coefficients for "b" countries ranged between 35 percent and 54 percent; those for "a" countries between 31 percent and 47 percent (Table 6).

During the period 1970s–1980s, although neither the averages nor the ranges of the Gini coefficients changed significantly for the 19 countries, some of these countries experienced considerable changes in their Gini coefficients. For example, the "before-tax" Gini coefficients for Trinidad and Tobago and Turkey declined by seven percentage points (income distribution became less unequal), while those for Sri Lanka and Guatemala

increased, respectively, by six and nine percentage points (income distribution became more unequal). The Philippines, Indonesia, and Malaysia experienced a smaller, but still considerable, improvement in their income distribution, while Bangladesh, Singapore, and Thailand experienced a considerable deterioration.<sup>23</sup>

Based on the economic growth and income distribution performances of the 19 sample countries, it is not evident that a prolonged economic growth, in and of itself, while having a powerful impact on poverty reduction, necessarily leads to an improvement in income distribution. Among the high-growth countries, Malaysia and Indonesia achieved a considerable improvement in income distribution, but both Thailand and Singapore experienced a significant deterioration. Such low-growth countries as Trinidad and Tobago and the Philippines significantly improved their income distribution; Guatemala achieved a low growth and a deterioration in income distribution.<sup>24</sup>

### Changes from the 1980s to the 1990s

For the group of 10 sample countries for which comparable income distribution data are available, the average Gini coefficient increased by three percentage points from the 1980s to the 1990s. As from the 1970s to the 1980s, the modest increase in the average Gini coefficient masks a considerable variation in the changes in Gini coefficients across countries.

From the 1980s to the 1990s, however, unlike from the 1970s to the 1980s, a much larger number of countries experienced a considerable increase in their Gini coefficients.

The 10-country sample for which comparable income distribution data are available for the 1980s and the 1990s include several transition countries, which experienced a substantial deterioration in income distribution during the period 1980s–1990s. Thus, the Gini coefficients for Poland, Bulgaria, and Hungary increased by between 4 and 9 percentage

---

<sup>23</sup> Although the changes in Gini coefficients in general are consistent with the changes in quintile shares, results for some countries need to be interpreted with caution. For example, Trinidad and Tobago and Turkey, for which data show an improvement in income distribution, had only three surveys during the period 1970s–1980s. The before-tax Gini coefficient for Trinidad and Tobago, at 51 percent, was unusually high in 1971, compared with 1959, 1976, and 1981, when it ranged between 42 percent and 46 percent. The before-tax Gini coefficient for Turkey, declined from 56 percent in 1968 to 51 percent in 1973 and to 44 percent in 1986, with corresponding increases in the income share for the poorest quintile from 3 percent in 1968 to 4 percent in 1973 and 5 percent in 1986.

<sup>24</sup> Trinidad and Tobago and Turkey, the two countries that each reduced their Gini coefficients by seven percentage points, achieved the improvement in income distribution by reducing both the income shares of the poorest and the richest quintiles, but reducing the latter more than the former. Among the countries that experienced a deterioration in income distribution, both Thailand (a high-growth country) and Guatemala (a low-growth country) achieved a large increase in the income share of the richest quintile accompanied by a reduction in the share for the poorest quintile.

Table 6. Nineteen Developing Countries: Income Distribution, 1970s-1980s  
(In percent unless otherwise indicated)

		1970s (1)				1980s (2)				Change (3)=(2) - (1)			
		Gini	Shares		Ratio	Gini	Shares		Ratio	Gini	Shares		Ratio
			Q1	Q5	Q5/Q1		Q1	Q5	Q5/Q1		Q1	Q5	Q5/Q1
Average	All countries	44	5	50	12	44	5	49	11	0	0	0	-1
	"b" countries	46	5	51	13	46	5	51	12	0	0	0	-1
	"a" countries	36	7	44	7	36	7	44	7	-1	0	-1	0
India	a	31	9	40	5	31	9	41	5	1	0	1	0
Pakistan	a	31	9	40	5	32	8	41	5	1	0	0	0
Bangladesh	b	35	7	43	6	37	7	45	6	2	0	2	1
Korea, R.	b	36	7	43	7	36	7	43	7	-1	0	0	0
Indonesia	a	37	8	44	5	33	8	42	5	-3	0	-2	0
Singapore	b	37	7	42	6	41	7	47	7	4	-1	5	1
Sri Lanka	b	39	7	46	7	45	6	47	8	6	0	1	1
Thailand	b	42	5	48	10	46	4	53	13	4	-1	4	3
Venezuela	b	43	5	47	10	44	5	49	10	1	0	2	0
Jamaica	b	45	4	50	12	43	5	49	9	-1	1	-1	-3
Costa Rica	a	47	4	53	15	46	4	51	13	-2	0	-2	-2
Trinidad	b	49	2	51	23	42	3	45	13	-7	1	-7	-10
Philippines	b	49	4	54	15	46	5	52	10	-3	2	-2	-5
Guatemala	b	50	6	54	9	59	2	63	27	9	-3	9	17
Turkey	b	51	4	57	16	44	5	50	10	-7	2	-7	-7
Malaysia	b	51	4	56	15	48	4	53	12	-3	1	-3	-3
Colombia	b	52	5	58	13	51	4	56	15	0	-1	-2	2
Panama	b	53	3	57	24	52	3	56	21	-1	0	-1	-3
Mexico	b	54	3	60	22	53	4	58	16	-1	1	-3	-6

Source: Deininger and Squire (1996).

"b" = Based on before-tax income

"a" = Based on after-tax income

Discrepancies are due to rounding errors.

Table 7. Ten Developing Countries: Changes in Income Distribution, 1980s-1990s 1/  
(In percent unless otherwise indicated)

		1980s (1)				1990s (2)				Change (3) = (2) - (1)			
		Shares		Ratio	Shares		Ratio	Shares		Ratio	Ratio		
		Gini	Q1	Q5	Q5/Q1	Gini	Q1	Q5	Q5/Q1	Gini	Q1	Q5	Q5/Q1
Average	All	35	8	43	7	38	7	45	8	3	-1	1	1
	"b" countries	35	7	43	8	38	7	45	9	3	-1	2	1
	"a" countries	35	8	43	6	37	7	44	7	2	-1	1	1
Hungary	a	23	11	34	3	32	7	39	6	9	-4	5	3
Bulgaria	b	23	10	33	3	28	9	37	4	5	-1	5	1
Poland	b	25	10	35	4	28	8	37	5	4	-1	2	1
India	a	31	9	41	5	31	9	41	5	0	0	0	0
Pakistan	b	32	8	41	5	31	8	40	5	-1	0	-1	0
Jordan	a	38	7	47	7	41	6	48	7	2	0	0	0
Mauritius	a	40	6	46	8	37	7	43	6	-3	1	-2	-1
Peru	a	43	6	50	8	45	5	50	10	2	-1	1	2
Thailand	b	46	4	53	13	50	4	57	15	4	0	4	2
Colombia	b	51	4	56	15	51	4	54	15	0	0	-2	0

Source: Deininger and Squire (1996).

"b" = Based on before-tax income

"a" = Based on after-tax income

1/ Discrepancies are due to rounding errors.

points. Bulgaria, having maintained a Gini coefficient of between 18 percent and 26 percent in the 1980s, experienced an increase in the Gini coefficient to 34 percent in 1993, substantially higher than previously, but still low by market-economy standards. Similarly, Poland has also experienced an increase in the Gini from between 21–27 percent to 33 percent.

As from the 1970s to the 1980s, the countries for which income distribution deteriorated included high-growth countries (e.g., Thailand), as well as low-growth countries (Jordan and European transition countries). On the contrary, Mauritius improved their income distribution while experiencing a low economic growth.

### C. Econometric Estimation of Gini Equations

Econometric estimation of Gini equations reveals possible factors underlying the changes in Gini coefficients. Equation (1) assumes a number of potential determinants of income distribution:

$$\text{Eq. (1)} \quad g_{it} = c_0 + c_1 r_{it} + c_2 r_{it} d_{it} + c_3 s_{it} + c_4 u_{it} + c_5 k_{it} + c_6 x_{it}$$

where

- g = Gini coefficient (percent),
- r = ratio of direct to indirect taxes (percent),
- d = ratio of direct taxes to GDP (percent),
- s = secondary school enrollment rate (percent),
- u = urbanization (percent),
- k = transition country dummy,
- x = inflation dummy, and
- i, t = country subscript, and time subscript for three decades (1970s, 1980s, and 1990s).

While the Deininger-Squire Gini estimates have been compiled on a reasonably comparable methodology across countries and through time, they are still not methodologically homogeneous, based on either consumption or before- or after-tax income that often include government transfers. The consumption Gini coefficients would reflect the effects of taxes.

The specification of Equation (1) is based on the recognition that, in view of these characteristics of the data, the explanatory variables included in the equation would affect the distribution of “market incomes.” The specification is aimed at testing the distributional implications of the nature of tax regime and the secondary school enrollment rate. Given the nature of data that include Gini coefficients based on consumption, as well as on pre-tax and after-tax incomes, taxes can affect consumption-based Gini coefficients. In many developing countries, an increase in secondary school enrollment is a critical means of improving the distribution of human capital and earnings capacity.

Table 8 offers the results of estimation. The results represent highly *tentative* evidence on the relationship between income distribution and its several potential determinants: the tax regime, secondary school enrollment, urbanization, and inflation. The hypothesis is that, other things being equal, the Gini coefficient is associated negatively (or income equality is associated positively) with (1) the ratio of direct to indirect taxes and (2) the secondary school enrollment rate. Since the distributional effects of the tax regime would depend not only on the tax structure, but also on the amount of tax revenue relative to GDP, the equation includes the product of the ratios of direct to indirect taxes and of direct taxes to GDP.

Both an increase in the ratio of direct to indirect taxes and an expansion of the secondary school enrollment rate would tend to reduce the Gini. Urbanization may have positive, negative, or neutral effects. Economic growth that allows an expansion of a high-income urban sector could increase income inequality; a rural-to-urban migration of unskilled workers might not have any effect on income inequality. Some studies have suggested that high inflation tends to be associated with high income inequality, although, over time, income distribution depends more on real factors (e.g., skills distribution) than on inflation.

The equation is estimated with various constraints for coefficients for two samples: one including developing and transition countries (estimates indicated by A) and the other including only developing countries (estimates indicated by B). In the sample including both developing and transition countries, the transition country dummy would capture the low Gini coefficients that the transition countries inherited from the socialist era. The estimates suggest the following:

- The effects of tax ratio and urbanization variables are statistically significant and the significance is fairly robust. In addition, the estimate of the coefficient for the variable representing the product of the ratios of direct to indirect tax and of direct tax to GDP is statistically significant for the (1.1.A) regression.
- The role of secondary education is unclear. For the A sample, without the transition country dummy, the estimate of the coefficient for the secondary school enrollment rate is statistically significant. However, the estimate is not statistically significant either for the B sample or for the A sample with the transition country dummy. The statistical significance for the A sample without the transition country dummy might reflect the difference of secondary school enrollment rate between transition and developing countries.
- The estimation suggests that inflation does not affect the long-term evolution of Gini coefficients.

Table 8. Developing Countries: Estimation of Gini Equations 1/

	Constant (c)	Ratio of direct tax to indirect tax 2/ (r)	(r) times ratio of direct tax to GDP (rd)	Secondary school enrolment rate (s)	Urbani- zation rate (u)	Transition country dummy (k)	Inflation dummy (x)
(1.1.A)							
Coefficients	41.722	-0.025	0.0008	-0.201	0.229		
t-ratios	15.19	-2.72	2.21	-3.62	4.80		
Adjusted R-square	0.200						
Number of observations	85						
(1.1.B)							
Coefficients	37.069	-0.019	0.0004	-0.054	0.213		
t-ratios	13.75	-2.07	1.08	-0.99	4.33		
Adjusted R-square	0.230						
Number of observations	78						
(1.2.A)							
Coefficients	33.779	-0.020		-0.062	0.313	-19.583	-1.010
t-ratios	11.64	-2.50		-0.93	6.76	-6.25	-0.38
Adjusted R-square	0.620						
Number of observations	55						
(1.2.B)							
Coefficients	34.176	-0.021		-0.077	0.322		-2.54
t-ratios	11.56	-2.47		-1.11	6.96		-0.61
Adjusted R-square	0.430						
Number of observations	48						
(A) Average		81	843	45	47		
Range		16-675	4-20800	4-95	8-100		
(B) Average		80	836	42	46		
Range		16-675	4-12222	4-95	8-86		

Sources: Based on the data from Deininger and Squire (1996) and International Monetary Fund, *International Financial Statistics* and *Government Finance Statistics*.

1/ Estimates marked by A and B, respectively, are for the sample of developing and transition countries and for the sample of developing countries.

2/ For the sample of developing and transition countries, the average of Gini coefficients is 41; the average of the ratio of direct taxes to GDP is 5.4 percent (A). For the sample of developing countries, the average of Gini coefficients is 43; the average of the ratio of direct taxes to GDP is 5.1 percent (A).

The explanatory power of the equations is rather limited, indicating that there are many other factors that influence income distribution.<sup>25</sup>

#### D. Role of Taxes and Government Social Spending Policy

##### Overview

The estimated equations reported in Table 8 suggest some evidence of the effects of the tax regime and secondary school enrollment on income distribution. One of the equations, Equation (1.1.A), indicates statistically significant effects of the two variables. The interpretation of the magnitudes of the estimated coefficients require some caution:<sup>26</sup>

- Other things being equal and in the neighborhood of averages, a revenue-neutral increase of 40 percentage points (from 80 percent to 120 percent) in the ratio of direct to indirect tax revenues would reduce the Gini coefficient only by 0.75 of a percentage point. A one percentage-point increase in the ratio of direct tax revenue to GDP and an increase of a same rate in indirect taxes, would *raise* the Gini coefficient by 0.06 of a percentage point.
- Other things being equal, a 10 percentage-point increase in the secondary school enrollment rate would reduce the Gini coefficient by 2 percentage points. This is a relatively large improvement in income distribution.

The Gini coefficients explained by the equation consist of those based on before-tax incomes, after-tax incomes, and consumption. The sign and statistical significance of the coefficient for the ratio of the direct to indirect taxes are consistent with the conclusions of the literature survey, which indicate the progressivity of direct taxes and of education expenditure, including secondary education expenditure. While the small magnitude of the effect of tax policy does not appear to suggest an active use of tax policy for redistribution, country-specific analyses might suggest different conclusions.

---

<sup>25</sup>The estimation, based on data representing averages for decades, does not support the hypothesis that inflation has a strong effect on income distribution. These results differ from those of the regressions based on annual or quarterly data, which often suggest significant effects of inflation on income distribution. This difference might suggest that, while inflation affects short-run changes in income distribution, it may not affect significantly the changes in income distribution through decades. The inflation dummy used in Equation (1.2) assumes 1 if the rate of inflation exceeds 100 percent per annum; 0 otherwise. Alternative inflation thresholds do not change the results significantly.

<sup>26</sup> Assume that  $r$  (ratio of direct to indirect taxes) is raised from 80 percent to 120 percent, by increasing  $d$  (ratio of direct taxes to GDP) from 5.4 percent to 6.6 percent (and, to keep the ratio of direct and indirect taxes to GDP constant, by reducing the ratio of indirect tax to GDP from 6.7 percent to 5.5 percent). On the basis of Equation (1.1.A), the effect of these changes on the Gini may be estimated by  $-0.025(40) + 0.0008[40(5.4) + 1.2(80)] = -0.75$ .

From the 1970s to the 1980s, five countries significantly reduced Gini coefficients (one of them on the basis of after-tax income), but five other countries significantly increased Gini coefficients (all on the basis of before-tax incomes) (Table 6).

The countries that significantly reduced Gini coefficients are Trinidad and Tobago, Turkey, the Philippines, Indonesia, and Malaysia. Indonesia and Malaysia achieved sustained high economic growth, pursued with strong poverty reduction and equity objectives. Malaysia and the Philippines had broadly progressive and well-targeted educational and health programs. Indonesia had progressive and well-targeted (albeit increasingly less effective) education programs, although its health programs were poorly targeted. Moreover, Indonesia and Malaysia raised their tax-to-GDP ratio, by increasing direct taxes but reducing indirect taxes as a ratio to GDP. In particular, both countries reduced international taxes significantly (Table 9).

The countries that significantly increased Gini coefficients are Bangladesh, Singapore, Thailand, Sri Lanka, and Guatemala. Of these, government education and health spending incidence studies are available only for Bangladesh, which had poorly targeted primary, secondary, *and* tertiary education programs, although its health program was considered progressive and well targeted. Singapore achieved a high economic growth, but Guatemala's growth was low. The deterioration in Thailand's Gini coefficient is notable: that country's high economic growth reduced poverty, but was regionally unbalanced, and the returns to education expenditures differed significantly among schooling levels and occupations (Ahuja, et al, 1997).

From the 1980s to the 1990s, only two countries significantly reduced their Gini coefficients (Jamaica and Mauritius), but nine countries significantly increased theirs, sharing the widespread experiences of both industrial, developing, and transition countries (Table 7). No public spending incidence analysis is available for Mauritius, but available studies suggest that Jamaica's foodstamp program was *progressive* and *well targeted*, although its tax system was considered to have either a *highly regressive* (income tax) or *mixed* or *insignificant* (overall tax system) incidence. Moreover, Jamaica's agricultural production responded strongly to the introduction of market-oriented reforms of the 1980s (Handa and Kin, 1997).

Of the nine countries for which income distribution deteriorated, China, Poland, Bulgaria, Romania, and Hungary were in the transition and in general achieved a low economic growth. Poland, Bulgaria, and Hungary experienced a large decline in their tax-to-GDP ratio (Table 10). Of the other four, Hong Kong and Thailand achieved a high economic growth, but Jordan and Nigeria experienced a low economic growth. No public spending incidence study is available for either Jordan, Nigeria, Hong Kong, SAR, China, or Thailand.

The increase in income inequality observed for the sample countries reflects, to a considerable extent, the increase in inequality in several transition countries included in the sample. However, even if the transition countries were removed from the sample, the upward

Table 9. Nineteen Developing Countries: Changes in Tax Structure, 1970s-80s  
(Percentage points of GDP)

		Changes: 1980s less 1970s					Changes in Income Distribution
		All	Direct	Indirect			
				All	Dom. Goods	Inter. Goods	
Average	All	1.6	1.0	0.5	0.6	-0.1	
	b	1.5	0.9	0.6	0.8	-0.2	
	a	2.1	1.4	0.4	0.1	0.3	
Trinidad and Tobago	b	5.9	6.4	-0.4	-0.3	-0.1	iid
Turkey	b	-1.9	0.4	-2.1	-0.7	-1.4	iid
Philippines	b	0.0	0.0	-0.1	0.7	-0.7	iid
Malaysia	a	1.9	2.3	-0.4	0.6	-0.9	iid
Indonesia	b	2.8	3.0	-0.5	0.2	-0.7	
Costa Rica	b	3.4	-0.2	1.7	-0.1	1.8	
Jamaica	b	3.8	0.0	5.0	5.5	-0.5	
Mexico	a	4.0	3.4	-0.4	-0.7	0.3	
Panama	b	0.1	0.6	0.1	0.6	-0.5	
Korea, R.	b	1.7	0.4	1.1	0.7	0.4	
Colombia	b	0.0	-0.7	0.9	1.2	-0.3	
India	b	2.5	1.0	1.8	0.2	1.5	
Pakistan	a	2.1	0.6	1.6	0.9	0.6	
Venezuela	a	0.1	-0.5	0.6	-0.4	1.0	
Bangladesh	b	1.1	0.2	1.0	0.1	0.9	did
Singapore	b	0.6	0.9	-0.7	0.4	-1.1	did
Thailand	b	1.6	0.9	0.6	1.0	-0.4	did
Sri Lanka	b	1.8	0.3	1.3	1.9	-0.6	did
Guatemala	b	-1.3	0.0	-0.9	0.3	-1.1	did

Sources: International Monetary Fund, *International Financial Statistics and Government Finance Statistics*.

iid = improvement in income distribution

did = deterioration in income distribution

trend in Gini coefficients would be notable, with many market-oriented developing countries sharing a similar experience with industrial countries.<sup>27</sup>

The role of changes in the tax system in this deterioration is not obvious. On average, these countries did not change their tax structure significantly, although many transition countries, which experienced an increase in their Gini coefficients, also suffered from a substantial reduction in their tax revenue.

None of the eight developing countries whose tax reforms were studied in a recent World Bank report has a pre-reform schedule of progressive tax rates successfully generating a progressive distribution of tax burdens (Thirsk, 1997). In general, tax reforms in developing countries have been aimed at increasing revenues with a degree of efficiency and with some attention to equity; rarely have they been aimed specifically at improving equity. While the literature survey suggests that income taxes tend to have a progressive effect, the regressions indicate that the magnitude of the effect might not be large.

Developing countries in general have been expanding primary and secondary school enrollment rates through public education programs. Transfer programs often have taken more of the form of untargeted food, fuel, fertilizer, and other subsidies than of cash transfers, such as unemployment benefits and pensions, which are largely limited to public sector employees. Transition economies started the transition to the market in the early 1990s with an expansive social programs and generally high levels of social indicators. The subsequent compression of output has forced many of them to reduce social spending. As a result, many of the transition economies experienced a deterioration in social indicators.

A number of reasons have been offered to explain increases in before-tax income inequality in the context of industrial countries.<sup>28</sup> Two of them might be applicable to developing countries:

- The opening up of low-income developing countries (e.g., China and India) to foreign direct investment and trade tends to reduce the wages of unskilled workers in middle-income developing countries (e.g., Thailand), which are competing with low-income countries.
- With globalization, developing countries gradually adapt their traditional income-equalizing social norms to those tolerating a higher degree of income inequality.

---

<sup>27</sup>See Atkinson (1999), for a discussion of the increasing inequality in industrial countries.

<sup>28</sup>See Freeman (1995) for a discussion of the effect of the opening up of low-income countries on the wages of unskilled workers in industrial countries and Tanzi (1998) and Atkinson (1999) for a discussion of the effects of changes in social norms for income distribution.

Table 10. Ten Developing Countries: Changes in Tax Burden/Structure, 1980s-90s  
(In percentage points of GDP)

		Changes: 1990s less 1980s					Changes in Income Distribution
		All	Direct	Indirect			
				All	Dom. Goods		
Average	All	-1.0	-0.3	-0.3	-0.1	-0.2	
	b	-2.4	-1.0	-0.3	-0.3	0.0	
	a	0.4	0.3	-0.3	0.2	-0.5	
Mauritius	a	-0.3	0.0	-1.2	1.2	-2.4	iid
Pakistan	b	0.5	0.4	0.1	0.3	-0.3	
India	a	-0.1	0.6	-0.7	-0.7	0.0	
Colombia	b	1.8	2.4	1.4	1.8	-0.4	
Peru	a	1.1	-0.1	-0.5	0.9	-1.4	
Jordan	a	6.5	1.1	4.9	3.9	1.0	did
Poland*	b	-4.4	-0.3	-1.1	-1.0	-0.1	did
Thailand*	b	2.8	2.3	0.1	0.3	-0.2	did
Bulgaria*	b	-12.6	-9.6	-1.8	-3.0	1.2	did
Hungary*	a	-5.1	0.0	-4.2	-4.4	0.2	did

Sources: International Monetary Fund, *International Financial Statistics* and *Government Finance Statistics*.  
iid = Improvement in income distribution  
did = Deterioration in income distribution

Among the countries that defied this broad trend were those that had progressive and well-targeted education and health programs that increased the earnings potential of low-income workers and some countries that achieved a sustained high economic growth, although not all high-growth countries achieved a reduction in inequality.

It is worth noting the difficulties in comparing before-tax and after-tax income inequality in developing countries. Unlike for industrial countries, for which separate Gini coefficient estimates are available for *before-tax*, *before-transfer* "market incomes," and *after-tax and after-transfer* "disposable incomes," Gini coefficients for developing countries are available only for *either* before-tax (but after-transfer) *or* after-tax (and after-transfer) incomes. Both types of Gini coefficients are available only for two countries on a common methodology.

Data are not available for *before-tax and before-transfer* Gini coefficient estimates and *after-tax and after-transfer* Gini coefficient estimates. However, the relatively small cash transfer programs in developing countries suggest that the two types of Gini coefficients for developing countries would not differ, on average, as substantially as in industrial countries.

### **Selected country experiences**

The remainder of this section discusses the nature of tax reforms and social expenditure policy and their distributional implications in Hungary, Indonesia, and Thailand, three of the countries that experienced a large change in the Gini coefficient. All of these countries increased the ratio of direct and indirect taxes and expanded secondary school enrollment. However, their achievements in income distribution diverged. While Indonesia reduced their Gini coefficients, Thailand and Hungary experienced an increase in their Gini coefficients (Table 11).

#### ***Hungary***

During the 1980s–1990s, Hungary's transition to a market-oriented society resulted in a large structural change in its economy, which suffered a long transitional recession. While modestly increasing both the ratio of direct to indirect taxes (by 24 percent) and the secondary school (by 22 percent) enrollment rate, Hungary suffered a 9-percentage-point increase in the after-tax Gini. The changes in the tax system and social protection programs discussed below had direct implications for the after-tax (and after-transfer) Gini. The changes in education programs probably influenced the before-tax Gini, which is not reported in this paper, and, thereby, the after-tax Gini. It is worth noting that the Gini increased, in spite of the increases in the ratio of direct to indirect taxes and the secondary school enrollment rate.

The reform of the Hungarian tax system began with the establishment of personal income and value-added taxes in 1988, followed by the introduction of a modern corporate tax in 1992. Since then, the attempt has been to improve the efficiency of the tax system by

Table 11. Selected Developing Countries: Changes in Gini Coefficient, Tax Structure, and Secondary School Enrolment

	Before tax (b) or after tax (a) Gini	Percentage point change in Gini		Percent change in DT/IT		Percent change in secondary school enrolment	
		70s-80s	80s-90s	70s-80s	80s-90s	70s-80s	80s-90s
<b>Large decline in Gini</b>							
Turkey	b		-7	151		128	
Trinidad and Tobago	b		-7	136		149	
Philippines	b		-3	100		116	
Malaysia	b		-3	153		118	
Indonesia		a	-3	147		190	
<b>Large increase in Gini</b>							
Singapore	b		4	125		115	
Thailand	b		4	138		112	
Sri Lanka	b		6	90		131	
Guatemala	b		9	119		146	
<b>Large decline in Gini</b>							
Mauritius		a	-3		105		116
<b>Large increase in Gini</b>							
Poland	b		4		103		117
Thailand	b		4		172		148
Bulgaria	b		5		59		91
Hungary		a	9		124		122

Sources: Tables 6, 7, 9, and 10.

DT = direct taxes; IT = indirect taxes.

adjusting marginal tax rates and brackets for personal and corporate taxes as well as by reducing tax exemptions. A broadening of the VAT base through rate rationalization and extension of coverage has accompanied this. The Hungarian tax system now relies more on direct and broad-based consumption taxes than in 1988. Some 40 percent of the revenue in 1998 accrued from personal, corporate, and value-added taxes compared with 30 percent in 1990.

Adjustments to the tax system have been made almost every year in the past decade. In 1988, the personal income tax consisted of 11 brackets, and the tax rates ranged from 20 to 60 percent; by 1999, there were three brackets ranging between 20 and 40 percent. The general profit tax was 50 percent in 1988, but was reduced to 20 percent of the corporate income in 1997. In 1988, the VAT comprised three rates: 0, 15, and 25 percent. The zero rate applied to most food products, fuels, pharmaceuticals, household heating, and exports; the 15 percent rate was levied on most services; and the 25 percent rate applied to about 40 percent of consumer expenditures. A major change was effected to the VAT rate structure in 1993; 80 percent of food products and household heating were subjected to the lower rate of 10 percent, and all public services began to be taxed at 25 percent. In 1998, the 10 percent rate was increased to 12 percent and zero-rating confined to pharmaceuticals and exports. Financial, education, health, and postal services are still tax-exempt.

Like other transition economies, Hungary started the transition to the market with expansive social welfare programs, including state-provided health and education services. The education system, which produced a secondary education enrollment rate of some 80 percent, enjoyed a pupil-teacher ratio that was even lower than in industrial countries. From the mid-1980s to the mid-1990s, the large reduction of untargeted price subsidies was compensated for by an increase in cash benefits to vulnerable groups, including old-age pensioners, families with children, and the unemployed.

### *Indonesia*

During the 1970s–1980s, Indonesia achieved sustained economic growth, improved income distribution, and reduced poverty. Indonesia also made progress in improving the tax system and in expanding education programs. Between the 1970s and the 1980s, the after-tax Gini coefficient declined by three percentage points; the ratio of direct to indirect taxes increased by 50 percent, although this ratio declined subsequently, and the secondary school enrollment rate almost doubled. It appears that both tax and social spending policies had reinforced each other in reducing the after-tax Gini.

Indonesia's tax reform during the 1980s was aimed at increasing revenues and enhancing the efficiency and simplicity of the tax system but without causing an adverse impact on the poor. The 1983 tax reform package aimed at broadening the base of the income taxes, but reducing their rates. It also included a VAT and a luxury sales tax, which were implemented in 1985. Subsequent reforms broadened the property tax. The VAT, from which unprocessed foodstuffs, certain farm products, and services were exempted, was extended later to

wholesale trade and other services. The result was a broader-based, more equitable tax system.

Indonesia expanded social programs largely on the strength of its sustained economic growth. Without a considerable increase in social expenditures as percent of GDP, social indicators improved. From the 1970s to the 1980s, the secondary school enrollment rate almost doubled. Significant improvements in school enrollments among the lower-income groups took place in the late 1970s. Indonesia had achieved nearly universal primary education by the late 1980s, although there were concerns that the improvements were achieved at the expense of the quality of education.

### *Thailand*

Thailand is a high-growth country that reduced poverty substantially. The proportion of people below the poverty line, the head count index has fallen from about 23 percent in 1981 to about 13 percent in 1992 (World Bank, 1996). More recently, in response to the financial crisis, Thailand expanded social safety net programs. During the 1970s–1990s, however, Thailand experienced a large increase in the before-tax Gini. It is unclear why the increase in the Gini occurred, in spite of a large expansion of secondary school enrollment. Between the 1980s and the 1990s, the Gini coefficient increased by four percentage points while the secondary school enrollment rate increased by 48 percent.<sup>29</sup> It is also unclear how the changes in the tax system have changed the after-tax Gini, which is not reported. The ratio of direct to indirect taxes increased by 72 percent. This expansion of direct taxes perhaps tended to reduce the after-tax Gini. As discussed below, however, the tax system has been changed frequently, in response to fiscal needs.

Thailand's changing direction on tax reforms has often been triggered by macroeconomic imbalances. During the 1973–76 period, for example, indirect tax rates were reduced to alleviate the burden of higher inflation and lower real GDP growth that followed the oil shock of 1973–74. The ensuing deficit spending in the next two years, which was intended to counteract slower real income growth, necessitated higher revenues. As a result, a series of tax rate increases were instituted during the 1977–79 period, followed by income tax rate reductions between 1980 and 1986, in the aftermath of the oil shock of 1979–80.

The burden of higher taxes in the 1977–79 period seems to have fallen mostly on indirect taxes that tend to be regressive; in the 1970s, indirect taxes, for example, made up almost 80 percent of all taxes. Reduction in tax rates in the 1980–86 period led to a decline in the buoyancy of personal income taxes that may have contributed to the increase in after-tax income inequality, since for a given income increase, the average effective tax rate did not

---

<sup>29</sup> Studies of Thailand's income inequality based on household surveys show that the increase in income inequality over the last three decades have been driven primarily by structural factors, such as levels of education (particularly secondary education), location of households (e.g., urban/rural regions) and occupational characteristics of households (e.g., entrepreneur, farm laborer). See Ahuja, Bidani, Ferreira and Walton (1997).

increase in the 1980s as much as it did in the 1970s.<sup>30</sup> The tax structure is complex and has been characterized by “base erosion resulting from special allowances, high standard deductions, and by failure to tax fringe benefits and non-neutrality in the tax treatment of different income sources on different transactions” (Tanzi and Shome, 1992). In 1989, Thailand carried out further tax reforms aimed at simplification, neutrality and revenue generation. The number of personal income tax (PIT) brackets were reduced from eleven to six and a greater number of low income tax payers were left out of the income tax net. No attempt was made to reduce expense deductions and allowances for business incomes.

In the early 1990s, Thailand introduced another series of tax reforms. VAT was introduced in 1992 at a rate of 7 percent which replaced an inefficient and complex business tax with 21 rates ranging from 0.10 percent to 50 percent; the number of PIT brackets was further reduced from six to four; the top PIT rate was reduced from 50 percent to 37 percent, and more incomes became subject to the lower tax rates. These tax simplifications, other things being equal, would not necessarily lead to a deterioration in income inequality. While the ratio of direct to indirect taxes rose by 70 percent from the 1980s to the 1990s, given the observed increase in income inequality in the 1990s, these reforms have not reversed the rise in income inequality,<sup>31</sup> nor the legacy of tax reforms of the earlier decades.

Social spending does not seem to have had much effect on income inequality, although the secondary school enrolment rate increased substantially. Government spending on transfer programs (in kind and cash) as well as employment generation programs constitute a small portion of government expenditure (about 1.6 percent during the 1990–95 period), and various programs are not well targeted toward regions with high incidence of poverty and inequality. Despite the increase in income inequality, government spending on education and health has remained steady in the last two decades at about 19 percent and 7 percent of total expenditures, respectively. There is no benefit incidence study of government transfer programs or social spending that can be used for analyzing the incidence structure of the past spending.

#### IV. SUMMARY AND CONCLUSIONS

The available data indicate that, before the effects of redistributive tax and transfer programs, *income inequality in developing countries, on average, is lower than in industrial countries.* However, while industrial countries improve income distribution effectively through taxes and transfers, developing countries do not have adequate redistributive programs to achieve a post-tax, post-transfer income equality comparative to those of industrial countries.

---

<sup>30</sup>The buoyancy of PIT declined to 2.2 in the 1980s from 2.7 in the 1970s (Warr and Nidhiprabha, 1996).

<sup>31</sup>Of course the counterfactual exercise always remains a credible explanation, i.e., the rise in income inequality would have been more in the 1990s, had the tax system in the 1990s remained the same as in the 1980s.

- Based on the data, compiled by Deininger and Squire (1996), that are broadly comparable intertemporally and internationally, before-tax (but after-transfer) Gini coefficients for developing (and transition) countries, on average, are lower than “market-income” Gini coefficients compiled by the OECD for industrial countries. For the 1990s, the former average 38 percent; the latter average 44 percent.
- Adequate data are not available for developing countries to assess the impact of the tax and transfer programs. There are indications that the tax and transfer programs in developing (and transition) countries are not as effective as in industrial countries. The before-tax and after-tax Gini measures for two separate groups of developing countries average, respectively, 38 percent and 34 percent. The difference does not exceed four percentage points between the two Ginis for two transition countries for which comparable data are available.
- Existing studies on tax and transfer incidence support the argument that their redistributive effects are not as large as in industrial countries (see below).

Studies of tax incidence suggest that *their redistributive effects are minor* in developing (and transition) countries.

- Developing countries have a tax structure dominated by indirect taxes and with a limited menu of capital and wealth taxes. In general, their weak tax administration gives rise to tax evasion, a marked difference between *de jure* and *de facto* tax regimes, and a low tax-to-GDP ratio. They have only limited formal cash transfer and social protection programs. These features cast doubt on the ability of tax (and transfer) policies in developing countries to redistribute income effectively. Corruption and poor governance also limit the effectiveness of taxes and transfers as redistributive instruments.
- Only 13 of the 36 overall tax systems studies were found to be progressive, the rest were either proportional or regressive. Over time, the progressivity has declined in several developing countries.
- It should be noted, however, that the survey found 13 tax systems to be progressive. In particular, most of the income taxes were progressive.

*Education, health, and transfer programs in developing countries, in general, had a progressive incidence, but many of them were not well targeted.*

- All primary and secondary education programs, but only half of the tertiary education programs assessed, had a progressive incidence. Their targeting, however, was less effective. While all health programs were progressive, only half of them were well targeted.
- While 14 of the 15 transfer programs were progressive, 9 of them were not well targeted.

- The incidence of government spending programs is not easy to assess because their effectiveness matters crucially. Government expenditure on an ineffective primary education program might be more a cash transfer to teachers than a benefit to schoolchildren.

In recent decades, *many developing countries have experienced an increase in income inequality* based on both before-tax and after-tax measures.

- The experiences during the 1970s–1980s appear somewhat different from those during the 1980s–1990s. From the 1970s to the 1980s, based on the data for a limited sample of developing countries, the average Gini coefficient remained unchanged, but the Gini coefficients for individual countries increased or declined, significantly in some cases.
- From the 1980s to the 1990s, based on the data for a limited sample of developing and transition countries, the Gini coefficients for most countries increased, substantially in some cases. The tax and transfer policies in developing and transition economies were not sufficiently effective in limiting the increase in after-tax and after-transfer Gini coefficients.
- Industrial countries also experienced a large increase in market-income Gini coefficients. Relative to developing and transition countries, however, industrial countries successfully used their taxes and transfers to limit the increase in disposable income Gini coefficients.<sup>32</sup>
- While many global and country-specific factors might be contributing to the widespread increases in income inequality, it appears that sound economic and social policies help either limit a deterioration of income distribution or achieve its improvement. High economic growth, alone, does not appear to ensure an improvement in income distribution.
- Possible factors underlying these changes are the impact of opening up low-income developing countries on middle-income developing countries and changes in social norms. The opening of low-income countries might have an adverse effect on the wages of unskilled workers in middle-income developing countries.
- Countries that pursued sound macroeconomic and structural policies, including sound social policies, improved their income distribution, in spite of the limited equity objectives of their tax reforms. For example, some countries (e.g., Jamaica, Indonesia)

---

<sup>32</sup>The implications of this redistributive effort for an improvement of social indicators is a separate issue. See Tanzi and Schuknecht (1997) for a discussion of how the large increase in transfer programs industrial countries in recent decades had only limited effects on their social indicators.

improved income distribution, *in spite of* the limited equity orientation of their tax reform efforts. The experiences of 12 OECD countries in the late 1980s and the early 1990s also have shown a limited redistributive effect of certain taxes. For example, studies of industrial countries have shown no evidence for a positive association between the progressivity of the personal income tax on one hand and the difference between before-tax and after-tax Gini coefficient on the other.<sup>33</sup>

- The use of tax instruments for redistribution remains an interesting issue that needs to be further explored. The survey finds income taxes to have progressive incidence. Should developing countries actively promote an expansion of these taxes to promote their expansion? Alternatively, should the developing countries promote an increase in tax revenue and use the revenue to expand well-targeted social programs? This question would be difficult to answer without considering individual countries' specific circumstances, such as the nature of their tax regime and tax administration. Countries that have capacity to increase tax revenue with a degree of progressivity without causing disincentive effects on work efforts would enrich their redistributive policy instruments. The econometric estimation of the Gini equations, however, suggests that the magnitude the effect might be small. If the progressivity of the tax system were achieved at the cost of revenue, relative to the case of a neutral tax regime, the gains in redistribution on the tax side could be more than offset by lost opportunities to use progressive expenditure policy instruments.

---

<sup>33</sup>See Wagstaff and others (1999). The before-tax and after-tax Gini refer to the Gini based on personal income tax alone.

**Annex Table 12. Tax Incidence Studies, 1975-1998: Summary of Characteristics**

Author/s, Year	Country/ies	Period	Income Concept	Households and/or Individuals Covered	Taxes Included	Measures of Progressivity 1/	Author's Conclusions 2/
<b>Country studies</b>							
Chowdhury, 1988	Bangladesh	1980 to 1984	Taxable income	CA and NCA 3/	Income tax	Not indicated	Regressive in CAs, some degree of progression in NCAs
Hassan and Bogetic, 1996	Bulgaria	1992	Household income and expenditure	All	Income tax	Not indicated	Modest progression
Milanovic, 1994	Bulgaria	1989	Household income	All	Payroll tax	Gini coefficients	Small impact Payroll taxes increase income concentration by 1.1
Foxley, 1979	Chile	1969	Household income and expenditure	All	Direct and indirect	Not indicated	Semi-proportional
Engel, Galetovic, Raddatz, 1998	Chile	1996	Household income and expenditure	All	Direct and indirect	Gini coefficients	Slightly regressive
Gillis and McLure, 1978	Colombia	1974	National income	High-income	Direct and indirect	Not indicated	Progressive
Berry and Soligo, 1980	Colombia	1970	Household income and expenditure	All	Direct and indirect	Not indicated	Substantial progressivity
Chia, and others, 1992	Cote d'Ivoire	1986	Gross household income	All	Direct, indirect plus subsidy	Welfare impact	Large redistributive effect but criss-crosses rich-poor spectrum
Holthus and Shams, 1994	Cote d'Ivoire	Early 1990s	Not indicated	Not indicated	Overall tax system	Not indicated	Slight improvement in redistributive effect
Sahn and Younger, 1998	Cote d'Ivoire	1985	Household income and expenditure	All	Direct and indirect	Concentration curves	Kerosene, excises export and import duties are regressive, rest are progressive 4/
Milanovic, 1994	Czechoslovakia	1988	Household income	All	Payroll tax	Gini coefficient	Income concentration slightly reduced
Santana and Rathe, 1993	Dominican Republic	1989	Household income	All	Direct and indirect	Not indicated	A degree of progressivity
El-Edel, 1979	Egypt	1958-59, 1964-65, 1974-75	Household income and expenditure	All	Total net tax	Gini coefficients	Progressive
Younger, 1993	Ghana	1977-78, 1981-82, 1987, 1990	Household income and expenditure	All	Direct and indirect	Progressivity coefficient	Regressive in 1977-78 and 1981-82 but less so in 1987, then proportional in 1990
Galper and Ramos, 1992	Guatemala	1992	Household income	All	Overall tax system	Not indicated	Progressive
Bahl, and others, 1996	Guatemala	1994 (estimate)	Household income	All	Overall tax system	Not indicated	Progressive
Hicks and Lee, 1997	Guatemala	1992	Household income and expenditure	All	Direct and indirect	Not indicated	Mildly progressive
Sahn and Younger, 1998	Guinea	1993-94	Household income and expenditure	All	Direct and indirect	Concentration curves	Taxes on exports and kerosene are regressive, rest are progressive 4/
Dublin, 1979	Guyana	1969-70	Household income and expenditure	All	Central government taxes	Not indicated	Largely progressive
Milanovic, 1994	Hungary	1989	Household income	All	Payroll and direct taxes	Gini coefficients	Payroll taxes increase income concentration by 1.2; direct taxes reduce income concentration by 1.5
Jarvis and Pudney, 1995	Hungary	1988 to 1994	Taxable income	All	Personal income tax	Not indicated	Progressive, but progressivity reduced over time
Toth and Abraham, 1996	Hungary	1994	Total declared income	All	Personal income tax	Not indicated	Progressive

Author/s, Year	Country/ies	Period	Income Concept	Households and/or Individuals Covered	Taxes Included	Measures of Progressivity 1/	Author's Conclusions 2/
Kattuman and Redmond, 1997	Hungary	1987 to 1993	Household income	All	Personal income tax	Decomposition analysis	Progressive and redistributive, but declining in importance
Newberry and Revesz, 1997	Hungary	1991	Household income and expenditure	All	Direct and indirect	Not indicated	Progressive, but reduced when analysis is restricted to active households
Jha and Srinivasan, 1989	India	1983-84	Personal expenditure	All	Indirect taxes	Modified Kakwani index	Mostly progressive or proportional
Murty, 1989	India	1979-80	Household income and expenditure	All	Commodity tax and personal income	Atkinson index	Progressive
Aggarwal, 1990	India	1961-62 to 1983-84	Personal income	All	Personal income tax	Index of redistributive impact	Redistributive, despite decreasing progressivity
Aggarwal, 1991	India	1961-62 to 1983-84	Personal income	All	Personal income tax	"Global" index of progressivity	Redistributive, despite decreasing progressivity
Aggarwal, 1994	India	1961-62 to 1983-84	Personal income	All	Personal income tax	RSTP and RISP Indices	Redistributive, despite decreasing progressivity
Achdut, 1996	Israel	1979-93	Household income	All	Direct taxes	Decomposition analysis	From 1979-84 taxes reduced inequality, however, redistributive effect weakened from 1985 onwards
Wasylenko, 1986	Jamaica	1975	Household income	All	Direct and indirect	Not indicated	Both pro-poor and pro-rich
Bird and Miller, 1989	Jamaica	1983-84	Household expenditure	Low-income	Indirect taxes	Not indicated	Proportional
Wasylenko, 1990	Jamaica	1983 and 1986	Comprehensive household income	All	Direct and indirect	Not indicated	In 1983, first 8 deciles progressive, then regressive; estimated more progressivity after reform
Alm, Bahl, and Murray, 1991	Jamaica	1983	Comprehensive individual income	Self-employed and employees	Income tax	Not indicated	Highly regressive
Sjoquist and Green, 1992	Jamaica	1990-91	Not indicated	All	Not indicated	Not indicated	Slightly more progressivity after 1986 reform
Holthus and Shams, 1994	Jamaica	Early 1990s	Not indicated	Not indicated	Overall tax system	Not indicated	No improvement in distributional effects
Mwega, 1986	Kenya	1976	Household income	All	Direct and indirect	Not indicated	Mixed but broadly progressive
Heller, 1981	Korea	1976	Household income	All	Direct, indirect, and property	Not indicated	Roughly proportional; progressive for top 10 percent
Leipzig, and others, 1992	Korea	1970 to 1986	Household and personal income	All	Overall tax system	Review of 4 studies	Neutral with respect to income distribution
Choi, 1997	Korea	1976 to 1991	Household and personal income	All	National and local	Review of 6 studies	More or less regressive
Sahn and Younger, 1998	Madagascar	1993	Household income and expenditure	All	Direct and indirect	Concentration curves	Taxes on exports and kerosene are regressive, rest are progressive 4/
Andic, 1974	Malaysia	1970	Cash and in-kind household income	Low-income	Rubber export taxes, import duties, excises, land and religious taxes	Not indicated	Roughly proportional
Gil-Diaz, 1982	Mexico	1972, 1980	Permanent household income	All	Direct, indirect and inflation	Not indicated	Progressive but uneven in 1972, smoother in 1990
Malik and Saqib, 1989	Pakistan	1978-79	Household income	All	All federal taxes, except export duties	Suits index	Slightly progressive
Escobal, and others, 1993	Peru	1985-90	Household expenditure	All	Fuel taxes	Not indicated	Gasoline tax is progressive, kerosene tax is regressive.
Yongco and Guevara, 1993	Philippines	1990	Gross household income	All	Direct and indirect	Not indicated	Generally progressive, though some regressivity in first quintile noted
Devarajan and Hossain, 1998	Philippines	1988, 1989	Household income	All	Direct and indirect	Not indicated	Basically neutral
Milanovic, 1994	Poland	1989	Household income	All	Payroll tax	Gini coefficients	Income concentration increased by 1

Author/s, Year	Country/ies	Period	Income Concept	Households and/or Individuals Covered	Taxes Included	Measures of Progressivity 1/	Author's Conclusions 2/
Bolkowiak, and others, 1996	Poland	1994	Gross household income	Employees, pensioners	Direct taxes	Not indicated	Progressive over first four quintiles, then regressive
Bolkowiak, and others, 1996	Poland	1994	Gross household income	Employees, pensioners	Indirect taxes	Not indicated	Progressive among employees, U-shaped among pensioners
Huang, 1976	Tanzania	1971	Household income	All	Direct and indirect	Not indicated	Progressive
Sahn and Younger, 1998	Tanzania	1991, 1995	Household income and expenditure	All	Direct and indirect	Concentration curves	Kerosene tax is regressive, rest are progressive 4/
Kibuka, 1977	Uganda	1961 to 70	Household income and expenditure	All	Direct and indirect	Not indicated	Progressive, biased against rural households
Kakwani, 1996	Ukraine	1989, 1991, 1992	Personal income	All	Personal income tax	Gini coefficient, progressivity index	Increasing progressivity
Milanovic, 1994	Yugoslavia	1989	Household income	All	Payroll and direct taxes	Gini coefficients	Direct taxes no impact; payroll taxes reduced income inequality by 0.6
<b>Surveys</b>							
McLure, 1977	Colombia	1970					Progressive, but not smooth
	Brazil	1962-63					
	Pakistan	1966-67					
	India	1963-64					
	Gujarat	1967-68					
	Mysore	1968-69					
	Lebanon	1968					
	Jamaica	1971-72					
Shah and Whalley, 1990	Pakistan						Overall tax system is broadly progressive
	Colombia						
	Sri Lanka						
	Jamaica						
	Brazil						
Thirsk, 1997 5/	Bolivia						No case of tax reform has led to progressive distribution of tax burdens
	Colombia						
	Indonesia						
	Jamaica						
	Korea						
	Mexico						
	Morocco						
	Turkey						

Sources: As indicated.

1/ Unless otherwise indicated, these studies do not employ an explicit quantitative measure of progressivity or redistributive impact. Instead, effective tax rates by income groups are visually inspected.

2/ When several types of taxes are included in the study, the conclusion refers to the overall tax burden (e.g., direct plus indirect taxes), unless otherwise indicated.

3/ Company assesses (CAs) and non-company assesses (NCAs).

4/ Progressive taxes include the VAT, all excises, taxes on wage, transport, and gasoline, and, except for Côte d'Ivoire, import duties.

5/ Thirsk's paper is an overview chapter from an anthology of articles on tax reform in developing countries and not, strictly speaking, a review of the literature.

### BIBLIOGRAPHY

- Achdut, Lea, 1996, "Income Inequality, Income Composition, Macroeconomic Trends: Israel, 1979-93," *Economica*, Vol. 63, Supplement, pp. S1-27.
- Aggarwal, Pawan K., 1990, "An Empirical Analysis of the Redistributive Impact of the Personal Income Tax: A Case Study of India," *Public Finance*, Vol. 45, pp. 177-92.
- , 1991, "A New Global Measure of Progressivity," National Institute of Public Finance and Policy Working Paper No. 6/91 (New Delhi: NIPFP).
- , 1994, "A Local Distribution Measure of Tax Progressivity," *Public Finance*, Vol. 49, pp. 1-11.
- Ahuja, Vinod, Benu Bidani, Francisco Ferreira and Michael Walton, 1997, *Everyone's Miracle? Rising Poverty and Inequality in East Asia* (Washington D.C., World Bank)
- Alm, James, Roy Bahl, and Matthew N. Murray, 1991, "Tax Base Erosion in Developing Countries," *Economic Development and Cultural Change*, Vol. 39, No. 4 (July), pp. 849-872.
- Andic, Fuat M., and Aris Bin Othman, 1974, "The Impact of the Tax System on the Poor: with Special Reference to Rural Poor: Draft Report" (mimeograph).
- Aninat, Eduardo, Andreas Bauer, and Kevin Cowan, 1999, "Addressing Equity Issues in Policymaking: Lessons from the Chilean Experience," in *Economic Policy and Equity*, ed. by Vito Tanzi, Ke-young Chu, and Sanjeev Gupta (Washington: International Monetary Fund).
- Alesina, Alberto, 1999, "Too Large and Too Small Governments," in eds. Vito Tanzi, Ke-young Chu and Sanjeev Gupta, *Economic Policy and Equity* (Washington: International Monetary Fund)
- Atkinson, A.B., 1999, "Equity Issues in a Globalizing World: The Experience of OECD Countries," in *Economic Policy and Equity*, eds. Vito Tanzi, Ke-young Chu, and Sanjeev Gupta (Washington: International Monetary Fund).
- Bahl, Roy, Jorge Martinez-Vazquez, and Sally Wallace, 1996, *The Guatemalan Tax Reform* (Boulder: Westview Press).
- Berry, R. Albert, and Ronald Soligo, eds., 1980, *Economic Policy and Income Distribution in Colombia* (Boulder: Westview Press).

- Bird, Richard M., and Barbara Diane Miller, 1989, "The Incidence of Indirect Taxes on Low-Income Households in Jamaica," *Economic Development and Cultural Change*, Vol. 37 (January), pp. 393–409.
- , and L. De Wulf, 1973, "Taxation and Income Distribution in Latin America: A Critical Review of Empirical Studies," *Staff Papers*, International Monetary Fund, Vol. 20, No. 3, pp. 639–682.
- Bolkowiak, Izabel, and others, 1996, "Tax Burden on Gross Incomes of Households," Institute of Finance Working Paper No. 49 (Warsaw: Institute of Finance).
- Bovenberg, Lans A., 1987, "Indirect Taxation in Developing Countries: A General Equilibrium Approach," *Staff Papers*, Vol. 34,2, pp. 333–373.
- Chia, Ngee-Choon, Sadek Wahba, and John Whalley, 1992, *Tax Incidence Analysis in Developing Countries: The Case of Côte d'Ivoire* (Washington: World Bank).
- Choi, Kwang, 1997, "Tax Policy Reforms in Korea," in *Tax Reform in Developing Countries*, ed. by Wayne Thirsk (Washington: World Bank).
- Chowdhury, Nuimuddin, 1988, "Income Tax Incidence in Bangladesh, 1980–84," *Bangladesh Development Studies*, Vol. 16 (September), pp. 81–97.
- Chowdhury, Osman H., 1991, "Revenue Neutral Value-Added Tax in Bangladesh: Some General Equilibrium Illustrations," *Bangladesh Development Studies*, vol. 19, no. 4, pp. 49–63.
- Clarete, Ramon, L., 1991, "A General Equilibrium Analysis of the Tax Burden and Institutional Distortions in the Philippines," in *Tax Policy in Developing Countries: A World Bank Symposium*, ed. by Javad Khalilzadeh-Shirazi and Anwar Shah (Washington: World Bank).
- Davoodi, Hamid R. and Swaitree Sachjapinan, 1999, "How Useful are Benefit Incidence Studies," forthcoming, IMF Working Paper. (Washington: International Monetary Fund).
- Devarajan, Shantayana and Shaikh Hossain, 1998, "The Combined Incidence of Taxes and Public Expenditures in the Philippines," *World Development*, Vol. 26, pp. 963–977.
- Deiningner, Klaus and Lyn Squire, 1996, "A New Data Set for Measuring Income Inequality," *World Bank Economic Review*, 10, pp.565–592.
- De Wulf, Luc, 1975, "Fiscal Incidence in Developing Countries: Survey and Critique," *Staff Papers*, International Monetary Fund, Vol. 22, No. 1, pp. 61–131

- Dublin, Keith Gordon Newton, 1979, "An Estimation of Tax Incidence in Guyana," (Ph.D. dissertation; Urbana-Campaign: University of Illinois).
- Edirisnghe, Neville, 1987, *The Food Stamp Scheme in Sri Lanka: Costs, Benefits, and Options for Modification*, Research Report No. 58 (Washington: International Food Policy Research Institute).
- El-Edel, M. Reda A., 1979, "Impact of Taxation on Income Distribution: An Exploratory Attempt to Estimate Tax Incidence in Egypt," Princeton-Egypt Income Distribution Project Conference Paper.
- Engel, Eduardo M.R.A., Alexander Galetovic, and Claudio E. Raddatz, 1998, "Taxation and Income Distribution in Chile: Some Unpleasant Redistributive Arithmetic," NBER Working Paper No. 6828 (Cambridge, Massachusetts: National Bureau of Economic Research).
- Escobal, Javier, and others, 1993, "Public Administration and Income Distribution in Peru," in *Government Spending and Income Distribution in Latin America*, ed. by Ricardo Hausmann and Roberto Rigobon (Washington: Inter-American Development Bank).
- Foxley, Alejandro, 1979, *Redistributive Effects of Government Programs: The Chilean Case* (Oxford: Pergamon Press).
- Freeman, Richard B., 1995, "Are Your Wages Set in Beijing," *Journal of Economic Perspectives* (Summer 1995).
- Galper, Harvey, and Fernando Ramos, 1992, "The Incidence of Guatemalan Tax," Technical Memorandum No. 32 (Atlanta: Georgia State University), cited in *The Guatemalan Tax Reform*, 1996, ed. by Bahl, Roy, Jorge Martinez-Vazquez, and Sally Wallace (Boulder: Westview Press).
- Gillespie, Irwin W., 1965, "Public Expenditures and Income Distribution," in *Essays in Fiscal Federalism*, ed. by Richard A. Musgrave (Washington: The Brookings Institute).
- Gillis, Malcolm, and Charles E. McLure, Jr., 1978, "Taxation and Income Distribution: The Colombian Tax Reform of 1974," *Journal of Development Economics*, Vol. 5, pp. 233-58.
- Gil-Diaz, Francisco, 1982, "The Incidence of Taxes in Mexico, A Before and After Comparison" (mimeograph).
- Grosh, Margaret, 1994, *Administering Targeted Social Programs in Latin America: From Platitudes to Practice* (Washington: World Bank).

- Hammer, Jeffrey S., Ijaz Nabi, and James A. Cercone, 1995, "Distributional Effects of Social Sector Expenditures in Malaysia, 1974-89," in *Public Spending and The Poor: Theory and Evidence*, ed. by Dominique van de Walle and Kimberly Nead (Baltimore: Johns Hopkins University Press).
- Handa, Sudhanshu, and Domien King, 1997, "Structural Adjustment Policies, Income Distribution and Poverty: A review of the Jamaican Experience," *World Development*, vol. 25, no. 6, pp. 915-930.
- Heller, Peter S., 1981, "Testing the Impact of Value-Added and Global Income Tax Reforms on Korean Tax Incidence in 1976: An Input-Output and Sensitivity Analysis," *Staff Papers*, International Monetary Fund, Vol. 28 (June), pp. 375-410.
- Harberger, Arnold C., 1998, "Monetary and Fiscal Policy for Equitable Economic Growth," in eds. Vito Tanzi and Ke-young Chu, *Income Distribution and High-Quality Growth*, The MIT Press, Cambridge, England.
- Hassan, Fareed M.A., and Željko Bogetic, 1996, "Effects of Personal Income Tax on Income Distribution: Example from Bulgaria," *Contemporary Economic Policy*, Vol. 14 (October), pp. 17-28.
- Hicks, Norman L., and Haeduck Lee, 1997, "The Impact of Fiscal Policies on the Poor in Guatemala," *Journal of Public Budgeting Accounting, and Financial Management*, Vol. 9 (Fall), pp. 501-15.
- Holthus, Manfred, and Rasul Shams, 1994, "Tax Reforms and Equity in ACP Countries," *Intereconomics: Review of International Trade and Development*, Vol. 29 (September/October), pp. 239-243.
- Huang, Yukon, 1976, "Distribution of the Tax Burden in Tanzania," *Economic Journal*, Vol. 86 (March), pp. 73-86.
- Hubbard, Glen, 1995, "Distribution Tables and Tax Policy," in *Distributional Analysis of Tax Policy*, ed. David F. Bradford. (Washington: AEI Press).
- Jarvis, Sarah, and Stephen Pudney, 1995, "Redistributive Policy in a Transition Economy: The Case of Hungary," CEPR Discussion Paper No. 1117 (London: Centre for Economic Policy Research).
- Jha, Shikha, and P.V. Srinivasan, 1989, "Indirect Taxes in India: An Incidence Analysis," *Economic and Political Weekly*, Vol. 24 (April), pp. 811-30.
- Kakwani, Nanak, 1996, "Income Inequality, Welfare and Poverty in Ukraine," University of New South Wales School of Economics Discussion Paper No. 94 (Australia: University of New South Wales).

- Kattuman, Paul, and Gerry Redmond, 1997, "Income Inequality in Hungary, 1987–1993," University of Cambridge Department of Applied Economics DAE Working Paper No. 9726 (U.K.: University of Cambridge).
- Kibuka, Robin D., 1977, "Income Distribution and Fiscal Incidence in Uganda, 1961–1970: A Thesis," (Ph.D. dissertation; Cambridge, Massachusetts: Harvard University).
- Leipziger, Danny M., and others, 1992, "The Distribution of Income and Wealth in Korea," EDI Development Studies (Washington: World Bank).
- McLure, Charles, E., 1977, "Taxation and the Urban Poor in Developing Countries," *World Development*, Vol. 5, No. 3, pp. 169–188.
- , 1974, "On the Theory and Methodology of Estimating Benefit and Expenditure Incidence," *Program of Development Studies* (William Marsh Rice University).
- Malik, Muhammad Hossain, and Najam us Saqib, 1989, "Tax Incidence by Income Classes in Pakistan," *The Pakistan Development Review*, Vol. 28 (Spring), pp. 13–26.
- Milanovic, Branko, 1995, "Impact of Cash and In-Kind Transfers in Eastern Europe and Russia," in *Public Spending and the Poor*, ed. by Dominique van de Walle and Kimberly Nead (Baltimore: Johns Hopkins University Press).
- Milanovic, Branko, 1994, "Cash Social Transfers, Direct Taxes, and Income Distribution in Late Socialism," *Journal of Comparative Economics*, Vol. 18 (April), pp. 175–197.
- Murty, M.N., 1989, *Redistributive Taxation and Public Sector Pricing: Some Theoretical Issues and The Indian Experience* (New Delhi: Commonwealth Publishers).
- Mwega, F. M., 1986, "Incidence of Taxes and Transfers in Kenya: A General Equilibrium Analysis," *Eastern African Economic Review*, Vol 2 (June), pp. 6–13.
- Newberry, David M.G., and Tamasz Revesz, 1997, "The Burden and Disincentive Effects of Hungarian Personal Taxes, 1988–96," CEPR Discussion Paper No. 1570 (London: Centre for Economic Policy Research).
- Sahn, David, and Stephen Younger, 1998, "Poverty and Fiscal Policy: Microeconomic Evidence," (mimeograph; Cornell University).
- Santana, Isidoro, and Magdalena Rathe, 1993, "The Distributive Impact of Fiscal Policy in the Dominican Republic," in *Government Spending and Income Distribution in Latin America*, ed. by Ricardo Hausmann and Roberto Rigobon (Washington: Inter-American Development Bank).

- Selden, Thomas M., and Michael J. Wasylenko, 1992, "Benefit Incidence Analysis in Developing Countries," World Bank Policy Research Working Paper No. 1015 (Washington: World Bank).
- Shah, Anwar, and John Whalley, 1990, "An Alternative View of Tax Incidence Analysis for Developing Countries," PRE Working Paper No. 462 (Washington: World Bank).
- , 1990, "An Alternative View of Tax Incidence Analysis for Developing Countries," PRE Working Paper No. 462 (Washington: World Bank).
- Shome, Parthasarathi, 1995, *Tax Policy Handbook*. (Washington: International Monetary Fund)
- Sjoquist, David L., and David Green, 1992, "Distribution of Tax Burdens," Jamaica Tax Review Project, Report No. 3 (Atlanta: Georgia State University), cited in Bahl, Roy, 1997, "The Jamaican Tax Reform: Its Design and Performance," in *Tax Reform in Developing Countries*, ed. by Wayne Thirsk (Washington: World Bank).
- Tanzi, Vito, 1974, "Redistributing Income Through the Budget in Latin America," *Banco Nazionale del Lavoro Quarterly Review*, Vol. 27 (March), No. 108, pp.65–87.
- , 1998, "Fundamental Determinants of Inequality and the Role of Government," IMF Working Paper 98/178 (Washington: International Monetary Fund).
- , Ke-young Chu, and Sanjeev Gupta, 1999, *Economic Policy and Equity*. (Washington: International Monetary Fund).
- Tanzi, Vito, and Ke-young Chu, 1998, *Income Distribution and High-Quality Growth*. MIT Press.
- Tanzi, Vito, and Ludger Schuknecht, 1997, "Reconsidering the Fiscal Role of Government: The International Experience," *American Economic Review*, 87,2, pp. 164–168.
- Tanzi, Vito, and Parthasarathi Shome, 1992, "The Role of Taxation in the Development of East Asian Economies," in Takatoshi Ito and Anne O. Krueger, *The Political Economy of Tax Reform*, The University of Chicago Press (Chicago and London).
- Thirsk, Wayne, 1997, "Overview: The Substance and Process of Tax Reform in Eight Developing Countries," in *Tax Reform in Developing Countries*, ed. by Wayne Thirsk (Washington: World Bank).
- Thirsk, Wayne, 1997, "Overview: The Substance and Process of Tax Reform in Eight Developing Countries," in *Tax Reform in Developing Countries*, ed. by Wayne Thirsk (Washington: World Bank).

- Toth, I.J., and A. Abraham, 1996, "Income Structure and Distribution of the Tax Burden (a study of the personal income tax returns of 1994)," *Acta Oeconomica: A Periodical of the Hungarian Academy of Sciences*, Vol. 48, Nos. 3-4, pp. 271-95.
- Wagstaff, Adam, Eddy Van Doorslaer, and Pierella Paci, 1989, "Equity in the Finance and Delivery of Health Care: Some Tentative Cross-Country Comparisons," *Oxford Review of Economic Policy*, Vol. 5 (Spring).
- Warr, Peter G., and Bhanupong Nidhiprabha, 1996, *Thailand's Macroeconomic Miracle: Stable Adjustment and Sustained Growth*, Oxford University Press.
- Wasylenko, Michael J. , 1986, *The Distribution of Tax Burden in Jamaica: Pre-1985 Reform* (Syracuse, New York: Metropolitan Studies Program, Syracuse University for Board of Revenue, Government of Jamaica).
- , 1990, "Tax Burden Before and After Reform," in *The Jamaican Tax Reform*, ed. by Roy W. Bahl (Cambridge, Massachusetts: Lincoln Institute of Land Policy).
- Westlake, M.J., 1973, "Tax Evasion, tax Incidence and the Distribution of Income in Kenya," *Eastern Africa Economic Review*, Vol. 5, no. 1, pp.1-27
- Whalley, John, 1984, "Regression or Progression: the Taxing Question of Incidence Analysis," *Canadian Journal of Economics*, Vol.17, no. 4, pp.654-682.
- Yoingco, Angel Q., and Milwida M. Guevara, 1993, "Study on the Incidence of the Philippine Fiscal System: Summary and Recommendations," *APTIRC Bulletin*, Vol. 11 (January), pp. 40-44.
- Younger, Stephen D., 1993, "Estimating Tax Incidence in Ghana: An Exercise Using Household Data," Cornell Food and Nutrition Policy Program Working Paper No. 48.
- Yitzhaki, Shlomo, Jeffrey D. Lewis, 1996, "Guidelines on Searching for a Dalton- Improving Tax Reform: An Illustration with Data from Indonesia," *The World Bank Economic Review*, Vol. 10, no.3, pp.541-62.
- Zee, Howell, 1999, "Inequality and Optimal Redistributive Tax and Transfer Policies," IMF Working Paper 99/60 (Washington D.C.: International Monetary Fund).

