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**Income Distribution and Tax, and
Government Social Spending
Policies in Developing Countries**

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

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ABSTRACT

This paper reviews income distribution in developing (and transition) countries in recent decades. On average, before-tax income distribution is less unequal in developing countries than it is 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 programmes in developing countries are not well targeted, but their incidence tends to be progressive.

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 has also 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 thereof) of tax and transfer policies. At the same time, questions have been raised about 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, such as 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 for formal cash transfer and social protection policies.¹ These features cast doubt on the ability of tax policy to redistribute income.²

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, 1998; Harberger, 1998). The major aim 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 foundation for an agreement among many researchers

¹ Alesina (1999) discusses the role of poor governance and the vicious cycle of the low tax-to-GDP ratio and tax evasion.

² See Tanzi (1998), who notes these and other practical problems involved in administering a progressive tax system in developing countries.

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 relative to industrial countries? Is 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 comparisons of income distribution, scarce high-quality data have limited studies of the long-term changes in and international comparisons 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 largely on a set of *newly available 'high-quality' income distribution data*.³ For the assessment of tax and government expenditure incidence, it relies on *existing incidence studies on individual countries*.

The paper is organized as follows. Section II provides a survey of the studies on the incidence of taxes and expenditures, paying particular attention to the incidence of government spending on education and health and reviewing the available evidence for a large number of developing countries. Section II 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 III concludes.

II THE ROLE OF TAXES AND SOCIAL SPENDING

The analysis of income distribution and the distributional implications of taxes and government spending is subject to many conceptual and practical

³ Deininger and Squire (1996). The paper also examines the WIDER database, which includes before-tax and after-tax Gini coefficients for the same set of developing and transition countries.

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 are still not adequate. Internationally comparable data on before-tax *and* after-tax household incomes for the same 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.

Subject to the above caveats and based on Gini data compiled for 22 countries by Deininger and Squire (1996), *before-tax* Gini coefficients in developing (and transition) economies range widely, between 25 per cent and 52 per cent, averaging 38 per cent; by contrast, *after-tax* Gini coefficients range between 25 and 45 per cent, averaging 34 per cent. The difference of four percentage points between the two averages *does not* necessarily suggest the redistributive impact of taxes. The two samples comprise two different sets of countries. This small difference between the before- and after-tax Gini coefficients for developing countries contrast with the large reduction in Gini coefficients that industrial countries achieve through redistributive tax and government transfer programmes.

The WIDER income distribution database and the Gini coefficients reported in tax incidence studies also support the conclusion that, on average, the taxes do not significantly reduce the Gini coefficients of developing and transition economies. (See subsection 2.2.)

2.1 Selective literature survey

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 analyse the distribution of disposable incomes and all government services, including defence, 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 return 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 the work efforts of individuals. 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 (for example, health and education services), but also because they affect the distribution of the earning capacities of individuals and households and thus help shape the distribution of market incomes over time. Some social expenditures (for example, 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. Subsection A provides an overview of the literature on how taxes and social expenditures are distributed among different income groups. Subsection 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 (that is, tax structure and secondary enrolment rate). Section D discusses the relationship between income distribution and taxes and government social spending policies in selected countries.

2.1.1 Existing surveys of tax incidence studies

This subsection discusses five surveys of available 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, 1991).⁴

Bird and de Wulf (1973), covering 29 studies on 17 Latin American countries, conclude that the tax systems in these countries are often *ineffective* as

⁴ Any study of tax incidence confronts problems, including the coverage of incomes and taxes, assumptions about the shifting and the measurement of the tax burden, the estimation of *counterfactual* before-tax income distribution, the behavioural 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 this is even more true when a country's major tax reform has made the task of reaching a firm conclusion regarding tax incidence difficult.

redistributive tools. Bird and de Wulf note that only four of 29 studies suggest that there is 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: 671).⁵ 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), in a later survey he notes that it is 'difficult . . . not to conclude that tax systems in LDCs must be *regressive*' (de Wulf, 1983: 366). 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 per cent of urban households) are at least twice those of the urban poor (bottom 40 per cent 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, 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 the assumptions used, and general indirect taxes to have a U-shaped incidence pattern.⁶

2.1.2 *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).

⁵ 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.

⁶ 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. The 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.

TABLE 1: DEVELOPING COUNTRIES: TAX INCIDENCE

		All taxes	Direct taxes	Income	Payroll	Indirect taxes
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		
1971-5	Colombia	pp				
	Mexico	p				
	Korea	prop				
	Jamaica	mixed				
	India			p-		
1976-80	Mexico	p				
	Pakistan	p				
	Korea	prop				
	Korea	r				
	India			p-		
	India					p
1981-5	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 ()
1991-5	Guatemala	p				
	Jamaica	insig				
	Poland		mixed			
	Bulgaria			p		
	Hungary			p-		
	India			p-		
	Bulgaria				insig	
	Poland					mixed

Source: Calculated from the data in Table 10.

Notes: PP = strongly progressive. P = progressive. P- = decline in progressivity. Prop = proportional. Insig = insignificant effect. Mixed = mixed. R = regressive. RR = strongly regressive. () = selective taxes studied.

Fully-specified computable general equilibrium models have gradually replaced various (forward or backward) shifting assumptions that featured in a large number of studies surveyed by Bird and de Wulf (1973) and Shah and Whalley (1990, 1991), although in some cases the results of judgmental studies have been close to those of 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 Hossain, 1998).

Mostly, however, tax incidence studies still visually inspect the effective tax rates by income group and present a judgement 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 *et al.*, 1996), to permanent income (Gil-Diaz, 1984). In addition, there are significant differences in the taxes studied, the units of analysis and the underlying assumptions.

For a better understanding of the state of knowledge about 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, the concept of income used, the taxes included, the unit of analysis (for example, individuals or households), the coverage (for example, all individuals, wage-earners, or pensioners), the measure of tax progressivity, and the study's conclusion about the tax incidence (Table 1).

Table 1 suggests the following:

- As regards *overall tax systems* or both direct and indirect taxes in the 19 countries studied, only 13 of 36 cases are progressive; seven are proportional; seven are regressive, and the rest have mixed findings or insignificant effects.

- As regards *income tax systems* in eight countries, *12 of the 14 cases are progressive*; one is regressive, and one has mixed findings. In the five cases of payroll taxes in three countries, three cases are regressive, and two cases have insignificant effects.
- Eight studies report a *decline* in 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).⁷

2.1.3 *The benefit incidence of government spending*⁸

In an exhaustive survey around 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'.⁹ Benefit incidence analysis is meaningful only if the data can be interpreted properly.¹⁰ The concepts of targeting and progressivity employed in this paper and commonly used to interpret such data need to be defined as follows:¹¹

⁷ For example, value-added taxes have a progressive incidence in four African countries (Sahn and Younger, 1998). Sahn and Younger (1998) provide no explanation for this non-conventional finding. See Bird and Miller (1989) and Shah and Whalley (1990, 1991).

⁸ This section draws on Davoodi and Sachjapinan (forthcoming).

⁹ 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 (for example, 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 the benefits of government spending can be shifted as much as the tax burden can.

¹⁰ 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.

¹¹ These definitions are used, among others, by Selden and Wasylenko (1992) and Castro-Leal, Demery and Mehra (1999).

- Government spending is considered to be well (poorly) targeted if the poorest quintile's share of benefits from the spending is larger (smaller) than that of the richest quintile.¹² Spending is well targeted, for example, if the poorest 20 per cent benefit more than the richest 20 per cent in absolute terms as a given benefit is allocated among the quintiles.
- 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 the respective quintile's income or expenditure. With progressive (regressive) spending, benefits represent a smaller (larger) fraction of the income or expenditure at higher income or expenditure quintiles.¹³

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 still be either progressive, or regressive. Targeting an expenditure well is a much more demanding objective than making the expenditure progressive.

(i) *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 2).¹⁴

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.¹⁵ Sub-Saharan Africa's record stands out in this group: the poorest quintile receives the least (13 per cent of benefits), and the richest quintile receives the most (32 per cent of benefits).

- In all regions, government spending on primary education is well targeted, but there are notable differences across the regions. Of government primary education spending, the poorest quintile in sub-Saharan Africa receives

¹² For analytical convenience, the poor are assumed to be in the bottom quintile and the rich in the top quintile.

¹³ Note the asymmetry between the definition and that for tax progressivity.

¹⁴ This pattern holds regardless of whether benefits are expressed in percentages of income or of expenditure.

¹⁵ The coverage of the Middle East is too narrow, as Tunisia is the only country on which there are data in this region.

slightly more than the richest quintile, whereas the poorest quintile in Latin America receives over four times more than 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, too. The poorest quintile receives 4.5 per cent of the benefits from government tertiary education spending, whereas the richest quintile receives as much as 59 per cent.

TABLE 2: DEVELOPING COUNTRIES:
INCIDENCE OF SELECTIVE SOCIAL EXPENDITURES*
(FREQUENCY: NUMBER OF COUNTRIES)

Education	Targeting				Progressivity			
	All	Primary	Secondary	Tertiary	All	Primary	Secondary	Tertiary
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	38							
Good	21							
Poor	17							
Incidence					30			
Progressive					30			
Regressive					0			
Transfers								
Targeting	14							
Good	4							
Poor	9							
Inconclusive	1							
Incidence					15			
Progressive					14			
Regressive					0			
Inconclusive					1			

Source: Davoodi and Sachjapinan (forthcoming).

Note: * Central government data.

The data compiled by Davoodi and Sachjapinan (forthcoming) also allow an analysis of the changes in benefit incidence *over time*. The available data indicate that, relative to that of the richest quintile, the share of the benefits from education spending received by the poor has increased. Of the 11

countries for which benefit incidence data for education are available, *eight countries show improvements among the poorest quintile*, while *three countries show a deterioration*.¹⁶

(ii) *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'¹⁷ (comprising expenditures on health centres, hospitals and hospital inpatients and outpatients) in a sample of 14 developing countries is progressive during the years (1974-95) for which data are available.¹⁸ Much like the case of 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 1978-95. Sub-Saharan Africa and transition economies are the only regions in which government health spending is poorly targeted. In contrast, the poorest quintiles in Asia and Latin America receive, respectively, 1.5 and three times as much in benefits as the richest quintiles.¹⁹
- The benefit incidence of health spending has changed *over time*. Of the 10 countries for which data on health spending are available at two points in time, the poorest quintile's share of benefits *has increased relative to that of the rich in five countries*, but *has decreased in another five*. Similarly,

¹⁶ Using the two latest incidence data for each country, one measures the changes in benefit incidence as changes in the ratio of Q1 (quintile 1) to Q5, where Q1 and Q5 have been defined previously. Among categories of education, there are more countries showing improvement than deterioration for government primary education and tertiary education spending, but there are as many cases of improvement as of deterioration for government secondary education spending.

¹⁷ 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.

¹⁸ This pattern holds regardless of whether benefits are expressed as percentages of income or of expenditure.

¹⁹ Spending on each subcategory of health expenditure is, on average, well targeted except for the 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.

changes in incidence in the subcategories of health spending do not follow a uniform pattern.

(iii) *Benefit incidence: other government expenditures.* Table 2 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 programmes 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 (Edirisinghe, 1987), although both universal and targeted programmes are found to be progressive, the food stamp programme in fact has resulted in a greater degree of progressivity and better targeting. Universal food subsidies in the sample countries are poorly targeted, with upper-income quintiles obtaining more benefits in absolute terms (for example, in 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, better targeting is sometimes achieved when pensions are combined with pro-poor family allowances and other benefits (see for example Milanovic, 1995). Meanwhile, residential utilities are often poorly targeted (though there is the counter example of Colombia in 1970-4 mentioned below).

A limited number of studies allow for meaningful comparisons *over time*. They generally show that there has been some improvement in progressivity and targeting. For example, in Chile (Aninat, Bauer and Cowan, 1999), the share of cash transfers received by the poorest quintile increased from 33 per cent in 1992 to 40 per cent 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 in 1970-4 resulted in a larger percentage of households in the poorest quintile gaining 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 per cent in 1986 to 9 per cent in 1992, although this is still somewhat lower than the corresponding 1983 share (10 per cent).

2.2 Changes in income distribution, 1970s-90s

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-90s). 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.²⁰

The average Gini coefficient for the sample countries was *stable* during the 1970s-80s. The average remained at 44 per cent for the 19 countries. The average Gini coefficient for the 10 sample countries increased only slightly, from 32 per cent to 34 per cent, during the 1980s-90s.

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-80s, the Gini coefficient for Thailand increased by four percentage points, while the Gini coefficient for Turkey declined by seven percentage points. During the 1980s-90s, Thailand and two transition countries (Bulgaria and Hungary) experienced a large increase in the Gini coefficient (see subsection 2.3 for further discussion).

The WIDER database suggests that taxes in developing and transition countries do not significantly reduce Gini coefficients. The Gini coefficients reported in tax incidence studies also suggest that taxes do not improve income distribution. The WIDER database, however, is not large enough to allow an assessment of changes in Gini coefficients during the 1970s-90s for a large number of countries (Tables 11 and 12).

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-90s.

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.

²⁰ The discussion of income distribution in this paper 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*.

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-90s
(%, UNLESS OTHERWISE INDICATED)

Income distribution 1970s-80s	1970s: Gini Q5/Q1		1980s: Gini Q5/Q1						
All countries	44	12	44	11					
15 'b' countries	46	13	46	12					
4 'a' countries	36	7	36	7					
Tax burden/structure 1970s-80s (% GDP)	Total		Direct	Indirect	Total		Direct	Indirect	
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			
Income distribution 1980s-90s				1980s: Gini Q5/Q1		1990s: Gini Q5/Q1			
All countries				32	7	34	8		
5 'b' countries				31	8	33	9		
5 'a' countries				35	6	37	7		
Tax burden/structure 1980s-90s (% GDP)				Total	Direct	Indirect	Total	Direct	Indirect
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 and 10 and IMF International Financial Statistics and Government Finance Statistics database.

Notes: 'b' countries = Gini coefficient and Q1 and Q5 estimates based on before-tax incomes. 'a' countries = Gini coefficient and Q1 and Q5 estimates based on after-tax incomes. Discrepancies are due to rounding.

2.2.1 Changes from the 1970s to the 1980s

For the period 1970s-80s, 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 four countries ('a' countries). During the 1970s, Gini coefficients for 'b' countries ranged between 35 per cent and 54 per cent, those for 'a' countries between 31 per cent and 47 per cent (Table 4).

During the period 1970s-80s, although neither the averages, nor the ranges of the Gini coefficients changed significantly for the 19 countries, the Gini coefficients for some of these countries changed considerably. 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 appreciable improvement in income distribution, while Bangladesh, Singapore and Thailand experienced an appreciable deterioration.²¹

TABLE 4: NINETEEN DEVELOPING COUNTRIES: INCOME DISTRIBUTION, 1970s-80s
(%, UNLESS OTHERWISE INDICATED)

		(1) 1970s				(2) 1980s				(3) Change=(2)-(1)			
		Gini		Shares		Gini		Shares		Gini		Shares	
		Q1	Q5	Q1	Q5	Q1	Q5	Q1	Q5	Q1	Q5		
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 Rep.	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).

Notes: 'b' = based on before-tax income. 'a' = based on after-tax income. Discrepancies are due to rounding.

²¹ 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, were the subject of only three surveys during the 1970s-80s. The before-tax Gini coefficient for Trinidad and Tobago, at 51 per cent, was unusually high in 1971 compared with 1959, 1976 and 1981, when it ranged between 42 per cent and 46 per cent. The before-tax Gini coefficient for Turkey declined from 56 per cent in 1968 to 51 per cent in 1973 and to 44 per cent in 1986, with corresponding increases in the income share for the poorest quintile from 3 per cent in 1968 to 4 per cent in 1973 and 5 per cent in 1986.

Based on the economic growth and income distribution performances of the 19 sample countries, it is not evident that 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 experienced low growth and a deterioration in income distribution.²²

2.2.2 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 in 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 (Table 5). In the 1980s to the 1990s, however, unlike in the 1970s to the 1980s, a much larger number of countries experienced a considerable increase in Gini coefficients.

The 10-country sample for which comparable income distribution data are available for the 1980s and the 1990s includes several transition countries which experienced a substantial deterioration in income distribution during the 1980s-90s. Thus, the Gini coefficients for Poland, Bulgaria and Hungary increased by between four and nine percentage points. Bulgaria, having maintained a Gini coefficient of between 18 per cent and 26 per cent in the 1980s, experienced an increase in the Gini coefficient to 34 per cent by 1993, substantially higher than previously, but still low by market-economy standards. Similarly, Poland also experienced an increase in the Gini from between 21-27 per cent to 33 per cent.

As in the 1970s to the 1980s, the countries in which income distribution deteriorated included high-growth countries (for example, Thailand), as well as low-growth countries (Jordan and European transition countries). In contrast,

²² 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 the income shares of both 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) showed a large increase in the income share for the richest quintile, accompanied by a reduction in the share for the poorest quintile.

Mauritius improved its income distribution, while experiencing low economic growth.

TABLE 5: TEN DEVELOPING COUNTRIES: CHANGES IN INCOME DISTRIBUTION, 1980s-90s (% UNLESS OTHERWISE INDICATED)

		1980s (1)				1990s (2)				Change (3) = (2) - (1)			
		Gini		Shares		Q5/Q1		Gini		Shares		Q5/Q1	
		Q1	Q5	Q1	Q1	Q5	Q1	Q1	Q5	Q1	Q5	Q1	Q5
Average	All countries	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).

Notes: 'b' = based on before-tax income. 'a' = based on after-tax income. Discrepancies are due to rounding.

2.3 Econometric estimation of Gini equations

The 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:

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

where

- g = Gini coefficient (per cent)
- r = ratio of direct to indirect taxes (per cent)
- d = ratio of direct taxes to GDP (per cent)
- s = secondary school enrolment rate (per cent)
- u = urbanization (per cent)
- k = transition country dummy
- x = inflation dummy
- i, t = country subscript and time subscript for three decades (1970s-90s).

While the Deininger-Squire Gini estimates have been compiled using a reasonably comparable methodology across countries and through time, they are still not methodologically homogeneous since they are based on either consumption, or before- or after-tax income that often includes 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 the tax regime and the secondary school enrolment rate. The equation hypothesizes that the ratios both of direct to indirect taxes and of direct taxes to GDP affect the Gini coefficient.²³ In many developing countries, an increase in secondary school enrolment is a critical means of improving the distribution of human capital and of earnings capacity.

Table 6 offers the results of the estimation.²⁴ The results represent highly *tentative* evidence on the relationship between income distribution and the several potential determinants of income distribution: the tax regime, secondary school enrolment, urbanization and inflation. The hypotheses 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 enrolment 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 enrolment 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

²³ This specification is aimed at estimating the effects of tax composition and the increase in the tax-to-GDP ratio separately. Without, for simplicity, the country and time subscripts for r and d , for a given value of d , the effect of tax composition is estimated by $c_1 + c_2d$, with d assessed at the sample average. For a given r , the effect of the tax-to-GDP ratio is estimated by c_2r , with r assessed at the sample average; in this case, the increase in d implies an increase in the tax-to-GDP ratio. In an alternative specification, one could include the ratios of direct taxes and indirect taxes separately. See footnote 26 for an interpretation of the estimates of coefficients.

²⁴ The estimation is based on corrected heteroscedastic standard errors.

associated with high income inequality, although, over time, income distribution depends more on real factors (for example, skills distribution) than on inflation.

TABLE 6: DEVELOPING COUNTRIES: ESTIMATION OF GINI EQUATIONS (a)

	Constant	Direct Tax/Indirect Tax (b)	Multiply Direct Tax/GDP by (r)	Secondary School Enrolment Rate	Urbaniz'n Rate	Transition Country Dummy	Inflation Dummy
	(c)	(r)	(rd)	(s)	(u)	(k)	(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-sq.	0.200						
Total 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-sq.	0.230						
Total 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-sq.	0.620						
Total 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-sq.	0.430						
Total 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 data from Deininger and Squire (1996) and IMF International Financial Statistics and Government Finance Statistics database.

Notes: a. Estimates marked by A and B are, respectively, for the sample of developing and transition countries and for the sample of developing countries. b. For the sample of developing and transition countries, the average Gini is 41; the average of the ratio of direct taxes to GDP is 5.4 per cent (A). For the sample of developing countries, the average Gini is 43; the average of the ratio of direct taxes to GDP is 5.1 per cent (B).

The equation is estimated with various constraints for the 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 have inherited from the socialist era. The estimates suggest the following:

- The effects of the 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 enrolment 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 differences in the secondary school enrolment rate between the transition and the developing countries.
- The estimation suggests that inflation does not affect the long-term evolution of Gini coefficients.

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

2.4 The role of taxes and government social spending policy

2.4.1 Overview

The estimated equations reported in Table 6 suggest some evidence of the effects of the tax regime and of secondary school enrolment on income distribution. One of the equations, Equation (1.1.A), indicates statistically

²⁵ 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 that there are 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 per cent per annum; '0' otherwise. Alternative inflation thresholds do not change the results significantly.

significant effects of the two variables. The interpretation of the magnitudes of the estimated coefficients requires some caution, as follows:²⁶

- Other things being equal and in the neighbourhood of averages, a revenue-neutral increase of 40 percentage points (from 80 per cent to 120 per cent) 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 at the 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 enrolment rate would reduce the Gini coefficient by two 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 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.

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 7).

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 programmes. Indonesia had progressive and well-targeted (albeit increasingly less effective) education programmes, although its health programmes were poorly targeted. Moreover, Indonesia and Malaysia raised their tax-to-GDP ratio by increasing

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

direct taxes, but reducing indirect taxes relative to GDP. In particular, both countries reduced international taxes substantially.

TABLE 7: NINETEEN DEVELOPING COUNTRIES: CHANGES IN TAX STRUCTURE, 1970s-80s (PERCENTAGE POINTS OF GDP)

		Changes: 1980s less 1970s					Changes: Income Distribution
		All	Direct	Indirect			
				All	Domestic Goods	International 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+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 Rep.	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

Source: IMF International Financial Statistics and Government Finance Statistics database.

Notes: iid = improvement in income distribution. did = deterioration in income distribution.

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 programmes, although its health programme was considered progressive and well targeted. Singapore achieved 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 industrial, developing and transition countries (Table 7). No public spending incidence analysis is available for Mauritius, but available studies suggest that Jamaica's foodstamp programme was *progressive* and *well targeted*, although its tax system was considered to have a *highly regressive* (income tax), or *mixed*, or *insignificant* (overall tax system) incidence. Moreover, Jamaica's agricultural production responded strongly to the introduction of the market-oriented reforms of the 1980s (Handa and King, 1997).

TABLE 8: TEN DEVELOPING COUNTRIES: CHANGES IN TAX BURDEN/STRUCTURE, 1980S-90S (PERCENTAGE POINTS OF GDP)

		Changes: 1990s less 1980s					Changes: Income Distribution
		All	Direct	Indirect			
				All	Domestic Goods	International 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

Source: IMF International Financial Statistics and Government Finance Statistics database.
Notes: iid = improvement in income distribution. did = deterioration in income distribution.

Of the nine countries in which income distribution deteriorated, China, Poland, Bulgaria, Romania and Hungary were in transition and in general achieved low economic growth. Poland, Bulgaria and Hungary experienced a large decline in the tax-to-GDP ratio (Table 8). Of the other four, Hong Kong and Thailand achieved high economic growth, but Jordan and Nigeria experienced low economic growth. No public spending incidence study is available for Jordan, Nigeria, Hong Kong, Special Administration Region, China, or Thailand.

The increase in income inequality observed in the sample countries reflects, to a considerable extent, the increase in inequality in the several transition countries included in the sample. However, even if the transition countries were removed from the sample, the upward trend in Gini coefficients would be notable, with many market-oriented developing countries sharing a similar experience with industrial countries.²⁷

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

None of the eight developing countries of which the tax reforms have been studied in a recent World Bank report has a pre-reform schedule of progressive tax rates that successfully generates a progressive distribution of tax burdens (Thirsk, 1997). In general, the 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 may not be large.

Developing countries in general have been expanding primary and secondary school enrolment rates through public education programmes. Transfer programmes have often tended to take more 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. At the outset of the transition to the market in the early 1990s, the transition economies had expansive social programmes 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 have experienced a deterioration in social indicators.

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

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

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

- The opening up of low-income developing countries (for example, China and India) to foreign direct investment and trade tends to reduce the wages of unskilled workers in middle-income developing countries (for example, 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.

Among the countries which have defied this broad trend are those that had progressive and well-targeted education and health programmes that increased the earnings potential of low-income workers, as well as some countries that achieved 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 the industrial countries, for which separate Gini coefficient estimates are available for *before-tax, before-transfer* 'market incomes' and *after-tax, 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, before-transfer* Gini coefficient estimates or for *after-tax, after-transfer* Gini coefficient estimates. However, the relatively small cash transfer programmes in developing countries suggest that the two types of Gini coefficients for developing countries would not differ, on average, as substantially as they do in industrial countries.

2.4.2 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 Gini coefficients. All these countries increased the ratio of direct and indirect taxes and expanded secondary school enrolments. However, their achievements in income distribution diverged. While Indonesia reduced its Gini coefficients, Thailand and Hungary showed an increase in their Gini coefficients (Table 9).

TABLE 9: SELECTED DEVELOPING COUNTRIES: CHANGES IN GINI COEFFICIENTS, TAX STRUCTURES AND SECONDARY SCHOOL ENROLMENTS

		Change in Gini		% Change in		
		1970s-	1980s-	1970s-	1980s-	
Large decline in Gini						
Turkey	b	-7		151		128
Trinidad + Tobago	b	-7		136		149
Philippines	b	-3		100		116
Malaysia	b	-3		153		118
Indonesia	a	-3		147		190
Large increase in Gini						
Singapore	b	4		125		115
Thailand	b	4		138		112
Sri Lanka	b	6		90		131
Guatemala	b	9		119		146
Large decline in Gini						
Mauritius	a		-3		105	116
Large increase in Gini						
Poland	b		4		103	117
Thailand	b		4		172	148
Bulgaria	b		5		59	91
Hungary	a		9		124	122

Source: Tables 6, 7, 9 and 10.

Notes: b = before-tax Gini. a = after-tax Gini. DT/IT = direct taxes/indirect taxes.

(i) *Hungary*. During the 1980s-90s, Hungary's transition to a market-oriented society resulted in a large structural change in the economy, which suffered a long transitional recession. While modestly increasing both the ratio of direct to indirect taxes (by 24 per cent) and the secondary school enrolment rate (by 22 per cent), Hungary suffered a nine-percentage-point increase in the after-tax Gini. The changes in the tax system and social protection programmes discussed below had direct implications for the after-tax (and after-transfer) Gini. The changes in education programmes 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 enrolment 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 adjusting marginal tax rates and tax brackets for

personal and corporate taxes, as well as by reducing tax exemptions. A broadening of the value-added-tax base through rate rationalization and the extension of coverage has accompanied this effort. The Hungarian tax system now relies more on direct and broad-based consumption taxes than it did in 1988. Compared with 30 per cent in 1990, around 40 per cent of the revenue in 1998 accrued from personal, corporate and value-added taxes.

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 per cent; by 1999, there were three brackets, which ranged between 20 and 40 per cent. The general profit tax was 50 per cent in 1988, but was reduced to 20 per cent of the relevant corporate income in 1997. In 1988 the value-added tax comprised three rates: 0, 15 and 25 per cent. The zero rate applied to most food products, fuels, pharmaceuticals, household heating, and exports; the 15 per cent rate was levied on most services, and the 25 per cent rate applied to about 40 per cent of consumer expenditures. A major change was effected in the rate structure of the value-added tax in 1993; 80 per cent of food products and household heating were subjected to the lower rate of 10 per cent, and all public services began to be taxed at 25 per cent. In 1998 the 10 per cent rate was increased to 12 per cent, and zero-rating was confined to pharmaceuticals and exports. Financial, education, health care and postal services are still exempt from taxes.

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

(ii) *Indonesia*. During the 1970s-80s, Indonesia achieved sustained economic growth, improved income distribution and reduced poverty. Indonesia also made progress in improving the tax system and in expanding education programmes. In 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 per cent, although this ratio declined subsequently, and the secondary school enrolment rate almost doubled. It appears that tax and social spending policies 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 was designed to broaden the base of income taxes, but reduce the income tax rates. It also included a value-added tax and a luxury sales tax, which were implemented in 1985. Subsequent reforms broadened the property tax. The value-added tax, from which unprocessed foodstuffs, certain farm products, and services were exempted, was later extended to wholesale trade and other services. The result was a more broadly based, more equitable tax system.

Indonesia expanded social programmes largely on the strength of its sustained economic growth. Social indicators improved without a considerable increase in social expenditures relative to GDP. In the 1970s and the 1980s, the secondary school enrolment rate almost doubled. Significant improvements in school enrolments 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.

(iii) *Thailand*. Thailand is a high-growth country that has reduced poverty substantially. The head count index (the proportion of people below the poverty line) fell from about 23 per cent in 1981 to about 13 per cent in 1992. More recently, in response to the financial crisis, Thailand has expanded social safety net programmes. During the 1970s-90s, 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 in secondary school enrolments. In the 1980s and the 1990s, the Gini coefficient increased by four percentage points, while the secondary school enrolment rate increased by 48 per cent.²⁹ It is also unclear how the changes in the tax system have altered the after-tax Gini, which is not reported. The ratio of direct to indirect taxes increased by 72 per cent. This expansion of direct taxes perhaps tended to reduce the after-tax Gini. As discussed below, however, the tax system has been modified frequently in response to fiscal needs.

Thailand's shifts in direction in tax reform have often been triggered by macroeconomic imbalances. During the 1973-6 period, for example, indirect tax rates were reduced to alleviate the burden of the higher inflation and lower

²⁹ Studies of Thailand's income inequality based on household surveys show that the increase in income inequality over the last three decades has been driven primarily by structural factors, such as levels of education (particularly secondary education), the location of households (for example, urban/rural regions) and the occupational characteristics of households (for example, entrepreneur or farm labourer). See Ahuja *et al.* (1997).

real GDP growth that followed the oil shock of 1973-4. The deficit spending over the next two years that was intended to counteract the slower real income growth necessitated higher revenues. As a result, a series of tax rate increases were instituted in 1977-9, followed by income tax rate reductions between 1980 and 1986 in the aftermath of the oil shock of 1979-80.

The burden of the higher taxes in 1977-9 seems to have fallen mostly on indirect taxes that tend to be regressive; in the 1970s, indirect taxes, for example, made up almost 80 per cent of all taxes. The reduction in tax rates in 1980-86 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 increase in the 1980s as much as it had in the 1970s.³⁰ 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 brackets were reduced from 11 to six, and a greater number of low-income taxpayers were left out of the income tax net. No attempt was made to reduce expense deductions or allowances for business incomes.

In the early 1990s, Thailand introduced another series of tax reforms. The value-added tax was introduced in 1992 at a rate of 7 per cent, which replaced an inefficient and complex business tax with 21 rates ranging from 0.10 per cent to 50 per cent; the number of personal income taxes brackets was further reduced from six to four; the top personal income tax rate was reduced from 50 per cent to 37 per cent, and more incomes became subject to the lower tax rates. Other things being equal, these tax simplifications would not necessarily have led to a deterioration in income inequality. While the ratio of direct to indirect taxes rose by 70 per cent in the 1980s and 1990s, given the observed increase in income inequality in the 1990s, these reforms did not reverse the rise in income inequality,³¹ nor the legacy of the tax reforms of earlier decades.

Social spending does not seem to have had much effect on income inequality, although the secondary school enrolment rate increased substantially.

³⁰ The buoyancy of the personal income tax declined to 2.2 in the 1980s from 2.7 in the 1970s (Warr and Nidhiprabha, 1996).

³¹ Of course the counterfactual exercise always remains a credible explanation, that is, the rise in income inequality would have been higher in the 1990s had the tax system remained in the 1990s as it had been in the 1980s.

Government spending on transfer programmes (in-kind and cash), as well as employment generation programmes, constituted a small portion of government expenditure (about 1.6 per cent in 1990-5), and various programmes are not well targeted towards regions with a 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 per cent and 7 per cent of total expenditures, respectively. There is no benefit incidence study of government transfer programmes or social spending that can be used to analyse the incidence structure of past spending.

III SUMMARY AND CONCLUSIONS

Though the amount of income distribution data for developing and transition countries is growing, it is still not adequate. The available data indicate that, without the effects of redistributive tax and transfer programmes, *income inequality is lower, on average, in developing countries than in industrial countries*. However, while industrial countries improve income distribution effectively through taxes and transfers, developing countries do not have adequate redistributive programmes to achieve a post-tax, post-transfer income equality comparable to that in industrial countries.

- According to the data which have been compiled by Deininger and Squire (1996) and which are broadly comparable intertemporally and internationally, the before-tax (but after-transfer) Gini coefficients for developing (and transition) countries are, on average, lower than the 'market-income' Gini coefficients compiled by the OECD for industrial countries. In the 1990s, the former averaged 38 per cent; the latter averaged 44 per cent.
- There are indications that the tax and transfer programmes in developing (and transition) countries are not as effective as those in industrial countries. The before-tax and after-tax Gini values for two separate groups of developing countries average, respectively, 38 per cent and 34 per cent. The difference does not exceed four percentage points between the corresponding Ginis for the two transition countries for which comparable data are available.
- Existing studies on tax and transfer incidence support the argument that the redistributive effects of these programmes are not as large in developing countries as they are in industrial countries. (See below.)

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

- The tax structure in developing countries is dominated by indirect taxes, with only a limited menu of capital and wealth taxes. In general, weak tax administration in these countries gives rise to tax evasion, a marked difference between *de jure* and *de facto* tax regimes and a low tax-to-GDP ratio. These countries have only limited formal cash transfer and social protection programmes. These features cast doubt on the ability of the 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 studied have been found to be progressive; the rest are either proportional, or regressive. Over time, the progressivity has declined in several developing countries.
- It should be noted, however, that the survey has found that 13 tax systems are progressive. In particular, most income taxes are progressive.

The education, health and transfer programmes in developing countries, in general, showed a progressive incidence, but many of them were *not* well targeted.

- All primary and secondary education programmes, but only half of the tertiary education programmes assessed exhibited progressive incidence. The targeting, however, was less effective. While all health programmes were progressive, only half of them were well targeted.
- While 14 of the 15 transfer programmes were progressive, nine were not well targeted.
- The incidence of government spending programmes is not easy to assess because the effectiveness of these programmes is crucial. For example, government expenditure on an ineffective primary education programme might end up being a mere cash transfer to teachers rather than a direct benefit for schoolchildren.

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

- The experiences of the 1970s-80s and of the 1980s-90s appear somewhat different. In the 1970s and 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, in some cases significantly.
- In the 1980s and 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.³²
- While many global and country-specific factors may be contributing to the widespread increases in income inequality, it appears that sound economic and social policies help either limit a deterioration, or achieve an improvement in income distribution. High economic growth alone does not appear to ensure an improvement in income distribution.
- Possible factors underlying these changes are the impact on middle-income developing countries of the opening up of low-income developing countries and changes in social norms. The opening up of low-income countries may 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 income distribution, in spite of the limited equity objectives of the tax reforms. For example, some countries (for instance, Jamaica and Indonesia) 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 show the limited redistributive effect of certain taxes. For example, studies of industrial countries have found no evidence for a

³² 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 programmes in industrial countries in recent decades has had only a limited effect on social indicators in these countries.

positive association between the progressivity of the personal income tax on the one hand and the difference between before-tax and after-tax Gini coefficients on the other.³³

- The use of tax instruments for redistribution remains an interesting issue that needs to be explored further. The survey finds income taxes to have progressive incidence. Should developing countries actively promote an expansion of these taxes? Alternatively, should developing countries promote an increase in tax revenue and use the revenue to expand well-targeted social programmes? This question would be difficult to answer without considering the specific circumstances of individual countries such as the nature of the tax regime and of tax administration. Countries that have the capacity to increase tax revenue and favour 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 of the effect may be small. If the progressivity of the tax system is 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 the lost opportunities to use progressive expenditure-policy instruments.

³³ See Wagstaff *et al.* (1999). The before-tax and after-tax Ginis refer to the Gini based on the personal income tax alone.

TABLE 10: TAX INCIDENCE STUDIES, 1975-98: SUMMARY OF CHARACTERISTICS

Author/s, Year	Country/ies	Period	Inc. Concept	Households, Individuals Covered	Taxes Included	Measures of Progressivity ^(a)	Author's Conclusions ^(b)
COUNTRY STUDIES							
Chowdhury 1988	Bangladesh	1980-84	taxable inc.	CA & NCA ^(c)	inc. tax	not indicated	regressive in CAs, some degree of progression in NCAs
Hassan, Bogetic 1996	Bulgaria	1992	household inc. & expend.	all	inc. tax	not indicated	modest progression
Milanovic 1994	Bulgaria	1989	household inc.	all	payroll tax	Gini coefficients	small impact payroll taxes increase inc. concentration by 1.1
Foxley 1979	Chile	1969	household inc. & expend.	all	direct & indirect	not indicated	semi-proportional
Engel, Galetovic, Raddatz 1998	Chile	1996	household inc. & expend.	all	direct & indirect	Gini coeff.	slightly regressive
Gillis, McLure 1978	Colombia	1974	national inc.	high inc.	direct & indirect	not indicated	progressive
Berry, Soligo 1980	Colombia	1970	household inc. & expend.	all	direct & indirect	not indicated	substantial progressivity
Chia, Wahba, Whalley 1992	Côte d'Ivoire	1986	gross household inc.	all	direct, indirect plus subsidy	welfare impact	large redistributive effect but criss-crosses rich-poor spectrum
Holthus, Shams 1994	Côte d'Ivoire	Early 1990s	not indicated	not indicated	overall tax system	not indicated	slight improvement in redistributive effect
Sahn, Younger 1998	Côte d'Ivoire	1985	household inc. & expend.	all	direct & indirect	concentration curves	kerosene, excises, export and import duties are regressive, rest are progressive ^(d)
Milanovic 1994	Czechosl.	1988	household inc.	all	payroll tax	Gini coeff.	inc. concentration slightly reduced
Santana, Rathe 1993	Dominican Rep.	1989	household inc.	all	direct & indirect	not indicated	a degree of progressivity
EI-Edel 1979	Egypt	1958-9, 1964-5, 1974-5	household inc. & expendit.	all	total net tax	Gini coefficients	progressive

Author/s, Year	Country/ies	Period	Inc. Concept	Households, Individuals Covered	Taxes Included	Measures of Progressivity ^(a)	Author's Conclusions ^(b)
Younger 1993	Ghana	1977-8, 1981-2, 1987, 1990	household inc. & expend.	all	direct & indirect	progressivity coefficient	regressive in 1977-78 and 1981-82, but less so in 1987, then proportional in 1990
Galper, Ramos 1992	Guatemala	1992	household inc.	all	overall tax system	not indicated	progressive
Bahl, Martinez-Vazquez, Wallace 1996	Guatemala	1994 (est.)	household inc.	all	overall tax system	not indicated	progressive
Hicks, Lee 1997	Guatemala	1992	household inc. & expend.	all	direct & indirect	not indicated	mildly progressive
Sahn, Younger 1998	Guinea	1993-94	household inc. & expend.	all	direct & indirect	concentration curves	taxes on exports and kerosene are regressive, rest are progressive ^(d)
Dublin 1979	Guyana	1969-70	household inc. & expend.	all	central gov't taxes	not indicated	largely progressive
Milanovic 1994	Hungary	1989	household inc.	all	payroll & direct taxes	Gini coefficients	payroll taxes increase income concentration by 1.2; direct taxes reduce income concentration by 1.5
Jarvis, Pudney 1995	Hungary	1988-94	taxable inc.	all	personal income tax	not indicated	progressive, but progressivity reduced over time
Toth, Abraham 1996	Hungary	1994	total declared inc.	all	personal income tax	not indicated	progressive
Kattuman, Redmond 1997	Hungary	1987-93	household inc.	all	personal income tax	decomposition analysis	progressive and redistributive, but declining in importance
Newberry, Revesz 1997	Hungary	1991	household inc. & expend.	all	direct & indirect	not indicated	progressive, but reduced when analysis is restricted to active households
Jha, Srinivasan 1989	India	1983-84	personal expend.	all	indirect taxes	modified Kakwani index	mostly progressive or proportional
Murty 1989	India	1979-80	household inc. & expend.	all	commodity tax & personal income	Atkinson index	progressive

Author/s, Year	Country/ies	Period	Inc. Concept	Households, Individuals Covered	Taxes Included	Measures of Progressivity ^a	Author's Conclusions ^(b)
Aggarwal 1990	India	1961-62 to 1983-84	personal inc.	all	personal income tax	index of redistributive impact	redistributive, despite decreasing progressivity
Aggarwal 1991	India	1961-62 to 1983-84	personal inc.	all	personal income tax	'global' index of progressivity	redistributive, despite decreasing progressivity
Aggarwal 1994	India	1961-62 to 1983-84	personal inc.	all	personal income tax	RSTP and RISP indices	redistributive, despite decreasing progressivity
Achdut 1996	Israel	1979-93	household inc.	all	direct taxes	decomposition analysis	from 1979-84 taxes reduced inequality; however, redistributive effect weakened from 1985 onwards
Wasylenko 1986	Jamaica	1975	household inc.	all	direct & indirect	not indicated	both pro-poor and pro-rich
Bird, Miller 1989	Jamaica	1983-84	household expend.	low income	indirect taxes	not indicated	proportional
Wasylenko 1990	Jamaica	1983, 1986	comprehensive household inc.	all	direct & indirect	not indicated	in 1983, first 8 deciles progressive, then regressive; estimated more progressivity after reform
Alm, Bahl, Murray 1991	Jamaica	1983	comprehensive individual inc.	self-employed & employees	income tax	not indicated	highly regressive
Sjoquist, Green 1992	Jamaica	1990-91	not indicated	all	not indicated	not indicated	slightly more progressivity after 1986 reform
Holthus, Shams 1994	Jamaica	Early 1990s	not indicated	not indicated	overall tax system	not indicated	no improvement in distributional effects
Mwega 1986	Kenya	1976	household inc.	all	direct & indirect	not indicated	mixed, but broadly progressive
Heller 1981	Korea	1976	household inc.	all	direct, indirect & property	not indicated	roughly proportional; progressive for top 10%
Leipziger <i>et al.</i> 1992	Korea	1970-86	household & personal inc.	all	overall tax system	review of 4 studies	neutral with respect to income distribution
Choi 1997	Korea	1976-91	household & personal inc.	all	national & local	review of 6 studies	more or less regressive

Author/s, Year	Country/ies	Period	Inc. Concept	Households, Individuals Covered	Taxes Included	Measures of Progressivity ^a	Author's Conclusions ^(b)
Sahn, Younger 1998	Madagascar	1993	household inc. & expend.	all	direct & indirect	concentration curves	taxes on exports and kerosene are regressive, rest are progressive ^(d)
Andic, Othman 1977	Malaysia	1970	cash & in-kind household inc.	low income	rubber export taxes, import duties, excises, land & religious taxes	not indicated	federal taxes are progressive (export, import, excise)
Gil-Diaz 1984	Mexico	1972, 1980	permanent household inc.	all	direct, indirect & inflation	not indicated	progressive, but uneven in 1972, smoother in 1990
Malik, Saqib 1989	Pakistan	1978-79	household inc.	all	all federal taxes, except export duties	Suits index	slightly progressive
Escobal <i>et al.</i> 1993	Peru	1985-90	household expend.	all	fuel taxes	not indicated	gasoline tax is progressive, kerosene tax is regressive.
Yoingco, Guevara 1993	Philippines	1990	gross household inc.	all	direct & indirect	not indicated	generally progressive, though some regressivity in first quintile noted
Devarajan, Hossain 1998	Philippines	1988, 1989	household inc.	all	direct & indirect	not indicated	basically neutral
Milanovic 1994	Poland	1989	household inc.	all	payroll tax	Gini coefficients	income concentration increased by 1
Bolkowiak <i>et al.</i> 1996	Poland	1994	gross household inc.	employees, pensioners	direct taxes	not indicated	progressive over first 4 quintiles, then regressive
Bolkowiak <i>et al.</i> 1996	Poland	1994	gross household inc.	employees, pensioners	indirect taxes	not indicated	progressive among employees, U-shaped among pensioners
Huang 1976	Tanzania	1971	household inc.	all	direct & indirect	not indicated	progressive
Sahn, Younger 1998	Tanzania	1991, 1995	household inc. & expend.	all	direct & indirect	concentration curves	kerosene tax is regressive, rest are progressive ^(d)
Kibuka 1977	Uganda	1961-70	household inc. & expend.	all	direct & indirect	not indicated	progressive, biased against rural households
Kakwani 1996	Ukraine	1989, 1991+2	personal inc.	all	personal income tax	Gini coefficient, progressivity index	increasing progressivity
Milanovic 1994	Yugoslavia	1989	household inc.	all	payroll & direct taxes	Gini coefficients	direct taxes no impact; payroll taxes reduced income inequality by 0.6

Author/s, Year	Country/ies	Period	Inc. Concept	Households, Taxes Included Individuals Covered	Measures of Progressivity ^a	Author's Conclusions ^(b)
SURVEYS						
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				
Shah, Whalley 1990	Jamaica	1971-72				overall tax system is broadly progressive
	Pakistan					
Thirsk 1997 ^(e)	Colombia					no reform has led to progressive distribution of burden
	Sri Lanka					
	Jamaica					
	Brazil					
	Jamaica					
	Bolivia					
	Colombia					
Indonesia						
Jamaica						
Korea						
Mexico						
Morocco						
Turkey						

Sources: As indicated.

Notes: a. 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. b. When several types of taxes are included in the study, the conclusion refers to the overall tax burden (for example, direct, plus indirect taxes), unless otherwise indicated. c. Company assesseees (CAs) and non-company assesseees (NCAs). d. Progressive taxes include the value-added tax, all excise taxes, taxes on wages, transport and gasoline and, except for Côte d'Ivoire, import duties. e. 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.

TABLE 11: THIRTY DEVELOPING AND TRANSITION COUNTRIES: INCOME DISTRIBUTION, 1970s-90s

Country	Decade	Gini Coefficient			Total Observations		Years Covered*	
		Before-Tax	After-Tax	Difference	Before-Tax	After-Tax	Before-Tax	After-Tax
Armenia	1990s	26.9	56.4	29.5	1	4	1990	1994-97
Belarus	1990s	25.9	24.6	-1.3	2	3	1990, 1995	1995-97
Brazil	1970s	56.2	55.3	-0.9	8	1	1970, 1972, 1976, 1978-79	1974
Bulgaria	1990s	28.2	33.4	5.3	9	7	1990-93, 1996	1992-97
China	1970s	27.3	31.7	4.5	2	1	1970, 1975	1978
	1980s	31.7	33.3	1.6	10	2	1980, 1982-89	1983, 1988
	1990s	36.2	43.0	6.8	3	1	1990-92	1995
Czech Republic	1990s	28.3	22.1	-6.1	1	13	1994	1990-97
Ecuador	1990s	51.5	43.0	-8.5	2	1	1993-94	1994
Estonia	1990s	36.2	37.6	1.4	19	9	1990, 1993-96	1992-98
Georgia	1990s	29.1	55.3	26.2	1	2	1990	1996-97
Hungary	1980s	26.9	22.4	-4.5	1	7	1989	1982, 1987, 1989
	1990s	28.1	26.3	-1.9	2	12	1991	1991, 1993-97
India	1970s	40.5	30.9	-9.6	1	4	1975	1970, 1972-73, 1977
Indonesia	1970s	42.7	36.6	-6.1	1	2	1976	1976, 1978
Latvia	1990s	24.0	32.2	8.2	1	1	1990	1996
Mauritius	1980s	45.7	39.6	-6.1	1	1	1980	1986
Mexico	1970s	52.5	51.0	-1.5	3	3	1975, 1977	1975, 1977
	1980s	50.6	55.0	4.4	5	1	1984, 1989	1989
Nepal	1970s	50.2	53.0	2.8	1	1	1976	1977
Nigeria	1980s	35.7	37.0	1.4	2	1	1981-82	1986
Pakistan	1970s	33.5	31.2	-2.3	6	3	1970-71, 1979	1970-71, 1979
	1980s	33.4	32.0	-1.4	3	4	1985, 1987-88	1985-88
Peru	1980s	49.3	42.8	-6.6	1	1	1981	1986
Poland	1970s	24.5	25.8	1.3	2	1	1978-79	1976
	1980s	26.0	25.3	-0.7	14	17	1980-89	1983-89
	1990s	29.5	27.6	-1.9	8	14	1990-93	1990-97

Country	Decade	Gini Coefficient			Total Observations		Years Covered*	
		Before-Tax	After-Tax	Difference	Before-Tax	After-Tax	Before-Tax	After-Tax
Romania	1980s	31.2	23.4	-7.8	1	1	1989	1989
	1990s	27.6	24.2	-3.4	3	3	1991-92, 1994	1990-92
Russian Federation	1990s	29.8	45.5	15.7	4	2	1990, 1994-96	1992, 1995
Singapore	1970s	38.7	34.0	-4.7	3	1	1973, 1978	1978
	1980s	41.3	35.5	-5.9	6	3	1980, 1983, 1988-89	1983, 1988
	1990s	37.8	37.9	0.0	1	2	1993	1993
Slovak Republic	1980s	22.1	18.6	-3.5	1	3	1989	1988-89
	1990s	23.7	20.2	-3.4	6	14	1990-93	1990-97
Slovenia	1990s	27.1	23.5	-3.6	2	3	1992-93	1991-93
Taiwan	1970s	29.3	28.9	-0.3	3	20	1970-72	1970, 1972-79
	1980s	32.5	29.0	-3.5	2	33	1986	1980-89
	1990s	31.3	30.7	-0.5	2	25	1991	1990-97
Tunisia	1970s	53.0	44.0	-9.0	1	1	1971	1975
USSR	1990s	28.1	30.5	2.4	1	1	1990	1993
Yugoslavia, FR	1990s	31.3	33.5	2.2	1	8	1997	1990-97
Yugoslavia	1970s	34.5	22.0	-12.5	2	1	1978	1978
Average	1990s	30.6	34.1	3.5	4	7		
	1980s	35.5	32.8	-2.7	4	6		
	1970s	40.2	37.0	-3.2	3	3		

Source: WIDER Inequality database.

* Some years may have multiple observations from various different original sources.

TABLE 12: TAXES AND INCOME DISTRIBUTION: SELECTED STUDIES

Country	Year	Gini Coefficient			Type of Tax	Source
		Before-Tax	After-Tax	Difference		
Bulgaria	1989	24.5	25.6	1.1	payroll tax	Milanovic, 1994
Chile	1996	48.8	49.6	0.8	direct and indirect	Engel, Galetovic, Raddatz, 1998
Czechosl.	1988	26.9	26.0	-0.9	payroll tax	Milanovic, 1994
Egypt	1958-9	44.5	43.0	-1.5	direct and indirect	EI-Edel, 1979
Egypt	1964-5	43.1	41.8	-1.3	direct and indirect	EI-Edel, 1979
Egypt	1974-5	43.1	42.2	-0.9	direct and indirect	EI-Edel, 1979
Hungary	1989	30.4	31.6	1.2	payroll tax	Milanovic, 1994
Hungary	1989	24.8	23.3	-1.5	direct personal tax	Milanovic, 1994
Poland	1989	33.5	34.5	1.0	payroll tax	Milanovic, 1994
Ukraine	1989	26.5	25.8	-0.7	direct taxes	Kakwani, 1996
Ukraine	1991	21.8	21.2	-0.6	direct taxes	Kakwani, 1996
Ukraine	1992	23.4	22.6	-0.8	direct taxes	Kakwani, 1996
Yugoslavia	1989	38.7	38.1	-0.6	payroll tax	Milanovic, 1994
Yugoslavia	1989	37.9	37.9	0.0	direct personal tax	Milanovic, 1994
Average		33.4	33.1	-0.3		

Sources: as indicated.

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