

Any views expressed in the Departmental Memoranda (DM) Series represent the opinions of the authors and, unless otherwise indicated, should not be interpreted as official Fund views.

DM/73/8

INTERNATIONAL MONETARY FUND

Fiscal Affairs Department

Taxation and Income Distribution in Latin America:  
A Critical Review of Empirical Studies<sup>1/</sup>

Prepared by R.M. Bird and L. De Wulf

January 29, 1973

Economists in recent years have become increasingly aware of the deficiencies in their customary treatment of the distribution of income and wealth. The conservative bias toward accepting the distributional outcomes generated by the market system which has traditionally been common in the profession has been sharply eroded by the accumulating evidence of market imperfections, by the new respectability of radical ideologies, and, not least, by the exposure of many economists to the pervasiveness of distributional issues in the real world. This new interest in distribution has taken many forms, from the publication of several important treatises and symposia on the theory and practice of income distribution to frequent statements by the various international agencies of their concern with distributional questions.

This new interest in distribution has of course been reflected in public finance literature as well. In fact, the subject is hardly a new one there, for the major questions confronting fiscal experts have always been distributional in nature, even if it has not always been considered wise to acknowledge this fact. Nevertheless, it seems fair to say that in recent years there has been a marked revival of concern with the impact, actual or potential, of the fiscal system on the distribution of income and wealth.

One manifestation of this concern is the growing number of studies on the incidence of the tax system--and, less often, of government expenditures as well--in one or another developing country. More generally, the need to relate fiscal analysis more closely to development

---

<sup>1/</sup> Paper presented at a Conference on Equity and Income Distribution in Latin America, Georgetown University, November 17, 1972. The present version of the paper has benefited from helpful comments received from Fuat Andic, Charles McLure, Jacob Meerman, Carl Shoup, and Richard Webb.

theory by considering as explicitly as possible the interaction between tax and expenditure policy, income distribution, and economic growth has come increasingly to the fore. In addition, as has long been true, tax reports in all countries customarily contain many references to the progressivity or otherwise of this or that tax, references which presumably allude to its effect on the distribution of income and wealth, though this is not always made as clear as one might hope. Finally, no conference on either taxation or income distribution would be complete without a session on the connection between the two.

It is impossible in one article to review all the literature relevant to the effects of taxation on income distribution in Latin America. We have therefore chosen to focus here on the narrower subject of the methods, findings, and usefulness of those quantitative studies which seek to determine the redistributive impact of Latin American tax systems. The continuing production of such studies by scholars and fiscal reform commissions in Latin America, as in the rest of the world, sufficiently justifies this focus. Section I of the paper summarizes the principal characteristics of the available studies and considers the numerous definitional and statistical problems which bedevil them. Section II then discusses a number of more basic conceptual and technical problems which call into question both the underlying rationale and the usefulness for policy purposes of many of these studies. There is perhaps little that is surprising about any of the points made in this section except the fact that they are so commonly ignored. Section III of the paper sketches briefly a few suggestions for redirecting to potentially more useful ends some of the scarce talent which might otherwise be devoted to similar questionable calculations of the distribution of the tax "burden."

### I. Survey of Tax Incidence Studies

It is now over twenty years since studies on the distribution of the burden of government revenues made their first appearance in Latin America. While the methodology of these studies has changed over the years, the state of the art has not advanced very much since the first crude attempts, and the changes reflect more the increased availability of data and the greater emphasis on redistributive government policies than any improvement in the theoretical underpinnings of these studies. This section compares the approaches and concepts of some two dozen studies covering seventeen countries in the Caribbean, Central America, and South America. The principal characteristics of the studies surveyed are summarized in Table 1 and the results of several of the studies are depicted in Table 2.

Table 1. Studies of Tax Incidence in Latin America

Country and Year of Data	Author and Date of Publication	Classification	Taxes Included <sup>1/</sup>	Income Concept
1. Argentina				
a. 1950	Consejo Federal de Inversiones; 1963.	24 geographical jurisdictions.	Comprehensive. Includes foreign exchange profits. Explicitly excludes government deficit.	Estimated net national income at factor cost.
b. 1954	Herschel; 1965.	Functional. Employment and nonemployment income.	Comprehensive. Includes government deficit and foreign exchange earnings.	Net national income at factor cost plus capital gains.
c. 1959	Programa Conjunto de Tributación; 1967.	10 income size classes.	Comprehensive. Includes social security contributions.	Personal income.
d. 1965	Bobrowski and Goldberg; 1970.	10 income size classes.	Comprehensive. Includes social security contributions.	Personal income.
2. Brazil				
a. 1962-63	Sahota; 1971.	5 educational classes. (8 cities, 9 towns, and 7 rural areas).	Comprehensive. Computations done with and without social security contributions, and with and without inflation tax. Excludes the quid pro quo taxes, also electricity and fuel taxes.	Income data as provided in family budget data. It is not clear what this includes.
b. 1962-63	Sahota; 1968.	Geographical combined with income size classes. 9 income classes for 8 cities, 9 towns, and 7 rural areas.	Same as Sahota (1971).	Same as Sahota (1971).
c. 1961-62	Aaron; 1968.	9 income size classes. National, rural and urban.	Same as Sahota (1971).	Probably same as Sahota (1971) although not explicitly stated.
3. Chile				
a. 1948 1952-54	Kaldor; 1956.	Functional: (a) wages and salaries; (b) self-employed income; (c) profits, interest, and rent.	Comprehensive. Direct and indirect taxes. Includes social security taxes.	Net national income at factor cost plus stock appreciation plus transfer payments.
b. 1963-67	Gillis; 1968.	4 income size classes.	Sales taxes.	Data obtained from consumer survey. Income is approximated by adding consumption to savings.
4. Colombia				
a. 1961	Taylor; 1965.	Income size classes. Quartiles.	Comprehensive. Not considered: exchange rate profits and fees.	National income at factor cost.
b. 1963	Bird; 1970.	Quartiles.	Same as Taylor (1965).	Personal income.
c. 1966	McLure; 1971.	9 income size classes.	Comprehensive. Included are exchange rate profits.	Disposable income adjusted for undistributed profits and unshifted corporate income taxes.
d. 1965 (on 1953 survey data)	Levin; 1968.	Employee income classes.	Sales tax.	Income reported in consumer survey.
5. El Salvador				
1946	Wallich and Adler; 1951.	Typical families.	Comprehensive. Includes fees.	Total family income (probably money income which might include transfer payments).

Table 1 (concluded). Studies of Tax Incidence in Latin America

Country and Year of Data	Author and Date of Publication	Classification	Taxes Included <sup>1/</sup>	Income Concept
6. Guatemala 1947-48	Adler, Schlesinger, and Olson; 1952.	Typical families: by giving weights to these families seven income classes were obtained. Indigenous and nonindigenous economy.	Comprehensive. Includes fees and social security contributions.	Total family income (probably money income, which might include transfer payments).
7. Jamaica 1958	Lovejoy; 1963.	9 income size classes.	Comprehensive. Includes fees.	Data obtained from consumer survey. Income is approximated by adding saving to consumption.
8. Panama 1969	McLure; 1971.	11 income size classes.	Comprehensive. No fees, no social security contributions.	Gross income to which unshifted corporation tax and retained earnings are added.
9. Peru a. 1958	Hunt; 1971.	Income in classes. Quartiles.	Comprehensive. Indirect-direct classification. Only Central Government taxes.	Refers to Musgrave (1963) concept and the Taylor (1965) concept.
b. 1960-63	Schydrowsky; 1971.	Traces redistributive effects of the "extra-budgetary tax and subsidy" effects of import duties.	Effect of import duties.	Referred in general to "income."
c. 1963	Brady; 1968.	25 income size classes.	Corporate profit tax.	Personal income.
d. 1961 1966 1969	Webb; 1972.	14 income size classes.	Comprehensive.	Personal income.
10. Puerto Rico a. 1958	Bhatia; 1960.	7 income size classes.	Comprehensive. No social security.	Not specified.
b. 1955-58	Andic; 1964.	17 income size classes for the allocation of personal income taxes. 9 income classes for the allocation of indirect taxes.	Personal income taxes. Indirect taxes.	Adjusted gross income for the allocation of personal income taxes. Personal income for the allocation of indirect taxes.
11. Surinam 1953-64	Andic and Andic; 1968.	Income classes: no formal description of these given. General references to lower-income, middle-income and upper-income classes.	The discussion covers all taxes classified as direct and indirect.	Refers in general terms to income--this type of approach need not specify income more fully.
12. Venezuela 1957	Shoup; 1959.	Typical families. 3 income size classes.	Comprehensive: but excludes some local gross receipts.	"Private income" arrived at from survey data, where respondents indicated their income bracket. Minus social security payments.
13. 10 Latin American countries	Musgrave; 1965.	Income size classes. Quartiles.	Comprehensive: individual income tax, company tax, property tax, indirect taxes, import tax.	See Shoup (1959).

<sup>1/</sup> All studies included the taxes levied at all different government levels except where noted otherwise.

Table 2. Estimated Effective Tax Rates by Income Size Class: Selected Latin American Countries

Country, Author and Year of Estimate	Monetary Unit	Income Classes														
<b>1. Argentina</b>																
Pesos																
Programa Conjunto; 1959	Total	Less than 25,000	25,001- 35,000	35,001- 50,000	50,001- 75,000	75,001- 100,000	100,001- 135,000	135,001- 175,000	175,001- 250,000	250,001- 375,000	Over 375,000					
	19.4	17.1	21.3	21.7	21.3	21.1	19.5	16.9	17.1	17.4	21.6					
Bobrowski and Goldberg; 1965	Total	Less than 90,000	90,001- 130,000	130,001- 185,000	185,001- 275,000	275,001- 365,000	365,001- 500,000	500,001- 650,000	650,001- 900,000	900,001- 1,400,000	Over 1,400,000					
	19.5	17.7	21.9	22.2	21.6	21.5	19.8	16.8	17.1	17.3	21.4					
<b>2. Brazil</b>																
In thousands of old cruzeiros																
Aaron; 1961-62	Total	Less than 99	100- 149	150- 249	250- 349	350- 499	500- 799	800- 1,199	1,200- 2,499	Over 2,500						
Rural		5.2	7.8	10.6	10.5	14.3	17.0	18.7	15.3	14.8						
Urban		3.6	4.4	4.6	4.1	4.1	4.6	5.3	6.4	6.5						
		16.2	19.8	21.6	22.5	23.3	24.1	23.3	19.9	18.0						
Sahota; 1962-63		3.6	4.4	4.6	4.2	4.4	4.7	5.4	6.4	6.3						
Rural	4.9	16.0	19.5	21.3	23.1	23.4	23.2	24.2	19.7	18.3						
Urban	21.0															
<b>3. Colombia</b>																
Pesos																
McLure; 1966	Total	Less than 3,000	3,001- 4,000	4,001- 5,000	5,001- 9,000	9,001- 15,000	15,001- 25,000	25,001- 80,000	80,001- 250,000	Over 250,000						
	14.8	12.6	10.4	13.4	12.8	11.8	13.2	15.4	17.1	19.7						
<b>4. Guatemala</b>																
In thousands of quetzales																
Adler et. al.; 1947-48	Total	Less than 300	301- 600	601- 1,200	1,201- 2,000	2,001- 5,000	5,001- 10,000	Over 10,000								
	9.0	4.0	7.0	9.0	11.0	12.0	12.0	11.0								
<b>5. Jamaica</b>																
Weekly income group in pounds																
Lovejoy; 1958	Total	Less than 2	2-4	4-6	6-8	8-10	10-15	15-20	20-30	Over 30						
		7.7	7.2	8.7	8.5	10.1	8.4	10.5	15.3	21.2						
<b>6. Panama</b>																
Balboas																
McLure; 1969	Total	Less than 500	501- 1,000	1,001- 1,500	1,501- 2,000	2,001- 2,500	2,501- 3,600	3,601- 6,000	6,001- 10,000	10,001- 20,000	Over 20,000	20,001- 50,000	50,001- 70,000	70,001- 100,000	Over 100,000	
	13.3	7.0	9.7	10.5	10.6	11.1	11.7	12.1	13.5	15.5	21.6	25.0				
<b>7. Peru</b>																
Soles																
Webb; 1961	Total	Less than 2,000	2,100- 3,000	3,100- 5,000	5,100- 7,500	7,600- 10,000	10,100- 12,500	12,600- 15,000	15,100- 20,000	20,100- 30,000	30,100- 50,000	50,100- 70,000	70,100- 100,000	100,100- 150,000	Over 150,000	
	14.5	3.6	4.0	4.7	6.4	7.7	8.1	9.9	11.1	11.9	14.7	17.2	21.4	26.8	23.4	
Webb; 1969	Total	Less than 5,900	6,000- 8,800	8,900- 13,000	13,100- 18,000	18,100- 22,000	22,100- 29,000	29,100- 37,000	37,100- 44,000	44,100- 59,000	59,100- 73,000	73,100- 103,000	103,100- 147,000	147,100- 220,000	Over 220,000	
	20.3	4.8	5.5	6.3	9.2	13.3	14.6	14.6	17.4	17.8	18.7	21.3	26.3	27.7	26.6	
<b>8. Puerto Rico</b>																
Dollars																
Bhatia; 1958	Total	Under 2,000	2,001- 3,000	3,001- 4,000	4,001- 5,000	5,001- 7,500	7,501- 10,000	Over 10,000								
	13.7	9.9	12.3	11.5	12.0	13.2	17.0	27.5								

It should be made clear initially that no study in any country has attempted the probably impossible task of tracing the total effects of government finance on the economy, or on the distribution of income in the economy between different subgroups. Instead, most studies, in essence, compare the observed net after-tax incomes with the existing tax system to those which, it is assumed, would prevail if the same revenue were collected through a proportional income tax. This "differential incidence" approach is employed because taxes cannot simply be subtracted in order to yield an estimate of after-tax incomes, and a proportional income tax is assumed to be the most neutral alternative means at hand to finance government expenditures. Few studies are as clear on these matters as Musgrave's (1951) pioneering study of the United States, however, perhaps because most of them take for granted the formulation of the problem in that study and in Musgrave's subsequent paper on the Latin American scene (1965). In this respect, the Latin American studies are an interesting contrast to most of the similar studies on India, which tend to follow a rather different methodological approach, although the results are not very different (De Wulf).

The Musgrave paper (1965) is also much clearer on both the limitations of his empirical estimates and the rationale for nevertheless publishing them than are most studies. "This kind of analysis," he argued, "is needed for the simple reason that distributional considerations are and should be an important factor in tax policy and that the economist's informed guess, based on explicit and reasoned hypothesis, is to be preferred...to the implicit and haphazard assumptions of the practical man" (p. 31).

Although many tax incidence studies have been carried out more or less as a matter of course without any explicit mention of the purpose of making such a study or the use to which it might be put (Brady; Lovejoy; Shoup, 1959), it can probably be assumed that their purpose was in line with this statement. Other studies have focused more explicitly on the income redistributive role of government (Adler; Andic, 1964; Bhatia; Wallich; Webb, 1972a), while concern with the progressivity of the effective tax rate structure was the apparent rationale for some other studies (McLure, 1971b; Consejo Federal; Taylor). Finally, a few studies were carried out with very particular ends in mind, such as Sahota (1971), which attempts to provide information on the taxes borne by persons at specified educational levels in order to measure more accurately the private rate of return on investment in education.

## Alternative Approaches to Tax Incidence Studies

### Typical household approach

Data on the distribution of income, consumption patterns, and the allocation of tax revenues by income size classes are extremely unreliable in most developing countries. It is therefore not surprising that the earliest systematic approach to estimating the incidence of the tax system in these countries was the typical household approach, which was also used in the earlier studies in developed countries (Shoup, 1939; United Kingdom).

In this approach the taxes paid by a number of households which are assumed to have a predetermined size and source of income, family size, and pattern of consumption are estimated. The geographic location (Shoup, 1959) or the wealth (Adler; Wallich) of these families may also be specified. The three studies which used this approach in Latin America analyzed the incidence of the tax system for between 12 and 16 families considered to be representative of various significant groups in the economy. The assumed consumption pattern was used to determine the amount of indirect taxes paid, while their income taxes were computed in accordance with the provisions of the tax law. Some insight into the impact of the tax system may then be obtained by comparing the estimated taxes paid by the different families.

Given the method used to calculate tax liability in these exercises, however, it is clear that the results must be interpreted as legal or intended tax incidence rather than as actual tax burden estimates: "the tax burden shown...reveals computed tax liabilities and not actual tax payments" (Wallich, p. 135). The actual taxes paid by different groups depend also on tax evasion, which was not explored in these studies, as well as on the reality of the incidence assumptions. It is thus rather misleading to say, as does one study using this approach, that what is computed is "the annual amount of tax the family pays" (Shoup, 1959, p. 456).

The effective tax rates for typical families may be converted to an income size group classification by giving each a specified weight for its respective income class. This procedure clearly illustrates how the average effective tax rate for any income class may sometimes hide great differences in the taxes paid by individuals. While the average effective tax rate for the Q 10,000 and over income class in Guatemala in 1947-48 was estimated at 11 per cent, for example, a sugar cane producer with Q 10,000 of income was estimated to be taxed at 10 per cent while a coffee exporter was taxed at 22 per cent (Adler, p. 144). This method thus has the advantage of highlighting the often dramatic effects of geographical location, source of income, consumption pattern, and family size on tax liability.

Despite the potentially interesting results achievable with this approach, however, it appears in recent years to have been completely abandoned in favor of approaches which ignore individual variations and compute average effective tax rates for certain subgroups of the taxpaying population by comparing total income and estimated total tax payments for these subgroups.

#### Incidence by income size classes

Since most studies are interested primarily in the redistributive effects of government revenues, the approach most frequently adopted is to attempt to distribute the tax burden by income size classes. Because of the lack of data on income distribution in Latin America, most authors in practice used any available size classification that seemed half-way reliable, though most of them properly worried that the unreliability of the data impaired the quality of the results: "It must be recognized at the outset that because of the difficulty of obtaining data on income distribution, the estimates...can give no more than rough indications of the true pattern. Thus, these estimates should be interpreted with extreme caution" (McLure, 1971b, pp. 239-40). Surprisingly, however, some studies (e.g., Bhatia) use income distribution data found in other papers or publications without alerting the reader to their probably low reliability. Perhaps inevitably, even the more cautious studies sometimes leave the reader with an unwarranted impression of the accuracy and significance of their results: the insidious power of calculated numbers to prevail over cautionary words no doubt contributes to this outcome.

Most studies employing absolute income size classes (e.g., McLure, 1971a and 1971b; Lovejoy; Bobrowski; Bhatia) raise a problem related to the estimated effective tax rate for the open-ended upper-income group. With the inequality of income distribution typical in Latin America, it is usually important that one be informed of the percentage of the population belonging to this highest income class and of the share of total income accruing to them in order to evaluate the significance of the results. McLure (1971b), for example, estimates that Colombian families with incomes in excess of Col\$250,000 obtain 7.8 per cent of total income, comprise 0.1 per cent of total population, and have an estimated effective tax rate of 19.7 per cent. This estimate, which deals with a rather homogeneous group of families, is more informative when compared to the rates for lower-income classes than when the highest income group considered is much larger and heterogeneous (as in Bobrowski's estimates for Argentina). In some instances, the studies were unable to provide information on the income accruing to the highest income group and/or the share of total population belonging to this group (e.g., Gillis; Bhatia), which for many purposes substantially reduced the usefulness of the results.



Studies which use deciles and quartiles for income size classes (Musgrave, 1965; Hunt; Taylor; Bird, 1970a) get around the problem of open-ended income classes in a way, but at the cost of an upper-income class that is even more heterogeneous than in studies with a low cutoff point for the upper income class. On the other hand, the quartile approach avoids the distortions in effective rate patterns which can result from improperly chosen absolute income classes and permits interstudy comparison.

A number of techniques have been used to estimate the income distribution in particular countries, ranging from specially constructed income distribution series (e.g., McLure, 1971b; Webb, 1972b) to the simple assumption that the income distribution of Venezuela is a good enough approximation to the income distribution of other Latin American countries to permit the study of tax incidence for these countries on the basis of the Venezuelan income distribution (Musgrave, 1965). This latter assumption is obviously crude, as illustrated by Hunt for the case of Peru, where a substantial change of the structure of effective tax rates resulted when the Colombian income distribution was used instead of the Venezuelan one. A still greater change resulted when Webb (1972a), employed a specially constructed income distribution series for Peru. On the other hand, Musgrave's estimates for Brazil are in broad agreement so far as the directions of variations in the effective tax rate structure are concerned (while differing in their magnitude) with a later, much more detailed study for that country (Sahota, 1968). This result emerged, presumably, because the Venezuelan income distribution turned out to be a good approximation to that used for Brazil in the latter study.

Estimates of effective tax rates by income size classes, within severe limits discussed later in this paper, provide some information of interest in the evaluation of tax systems. However, as noted earlier, this procedure also suppresses individual differences which may have a considerable bearing on the effective tax burden of the families within any particular income size class. Adler (p. 149), for instance, estimated that in Guatemala the effective tax rates for heavy consumers of taxed goods and services exceeded those on light consumers of these items by 30 or 35 per cent. For some purposes, this sort of information is at least as interesting as the calculated average effective tax rates. It would appear that studies utilizing different approaches and different ways of grouping the population of a particular country might be more illuminating in many respects than still further studies of different countries along the now conventional income size class lines.

#### Other classification schemes

Interestingly, relatively little attention has been given to the factor share approach to tax incidence and income distribution, which is the only one with much basis in economic theory (compare, for example,

Ricardo with the latest growth models). Kaldor's study of Chile, however, compares the tax burden on wages and salaries, on profits and interest, and on income from the self-employed. The absence of data on the distribution of income by size class and the problems that would arise in the process of constructing these data also led Herschel to concentrate on a more aggregative classification for Argentina which bears some resemblance to a functional classification, although he distinguishes only between employment and nonemployment income.

A subsequent Argentine study (directed by Herschel for the Consejo Federal de Inversiones) faced the same data problems but resolved them differently by estimating the effective tax rate of 24 geographical jurisdictions, then relating these rates to the estimated per capita incomes of the jurisdictions. In this way, an impression was obtained of the distributional impact of the government revenue system.

This geographic approach, however, is not necessarily only a second-best solution to be used where data on income size distribution are unavailable. The absence of a clear relation between per capita income and effective tax rates for the different geographical jurisdictions found by the Argentine study is interesting in itself. Its value is enhanced when, as in the Argentine study, an attempt is also made to allocate government expenditures to the different jurisdictions. A similar approach may, for example, be useful in analyzing the role of local government finance in the process of economic development (Bird, 1970b, chapter 5). An alternative approach employed in a Brazilian study (Sahota, 1968) estimated the effective tax rates for nine income size classes in eight cities, nine towns, and seven rural areas. The same data were used by Aaron to obtain on the one hand estimates by income classes for the nation and on the other for an urban-rural classification. In an earlier, cruder study of Guatemala a similar split between the indigenous and nonindigenous economy was considered in "an attempt to take account of one of the major discontinuities in the Guatemalan income distribution" (Adler, p. 221).

No Latin American study appears to have taken the sectoral approach to the distribution of taxes (e.g., agricultural versus nonagricultural income), which has been frequently used in India (e.g., Gandhi). In view of the considerable policy interest and the large amount of theorizing on the transfer of resources between sectors in the course of development, the absence of such studies is rather surprising. Difficult as it would be to satisfy the data requirements for such a study, it would seem no harder than for most of the income size class studies and at least as relevant for policy formulation.

### A descriptive approach

Where data with respect to income distribution, consumption patterns, or tax revenues are unavailable or extremely unreliable, as is true in many developing countries, the most useful approach to the study of tax incidence may simply be to rely on logical deductions based on theoretical considerations and on the piecemeal information available in the country analyzed without going through a pseudo-rigorous exercise of aggregating all the results into a tax burden table. A good example of this approach is found in Andic (1968).

On the basis of available information about the government revenue structure in Surinam and reasonable assumptions on the consumption behavior of the different income classes, the Andics concluded in this study, for example, that "the relatively heavy weight of indirect taxes in the tax system of Surinam cannot be taken as an indication of the regressivity of the tax system as a whole. Nor, for that matter, is the progressivity of the rate structure of import duties a definite indication to the contrary" (p. 137). Exemptions from taxation and the assumed consumption pattern of the different income size classes helped the authors to "reach a conjectural statement that the effect of import duties is possibly not regressive" (p. 137). A similar approach was used to evaluate the redistributive impact of direct taxes, considering, for instance, the generous deductions and allowances for personal exemptions, the degree of evasion and the income levels at which it occurs, and the absence of capital gains taxation. The conclusions drawn from this analysis are necessarily very cautious: for example, "it would not be surprising...that it is the middle income groups that bear the highest share of the direct taxation" (p. 139).

In this approach no attempt was made to quantify assumptions or to prove anything. The illusion of exactness which so often deceptively emerges from the other approaches was thus avoided. Regular consumers of the output of such exercises might well, of course, be unsatisfied and press for more quantifiable results. The Andics themselves resorted to this descriptive approach because "the most basic data fail" (p. 136); and not as the result of any conviction that this approach would yield more meaningful results than alternative approaches. In fact, however, it may be in many circumstances that the descriptive method is a theoretically defensible approach and not merely a second-best solution to data difficulties.

### The Concept of Income

Concern with tax incidence often arises from concern with the welfare implications of government activity. The usual approach to tax incidence studies in effect implicitly equates welfare with income, without alerting the reader to the many problems in thus linking the two (Bentzel).

Another general problem with this approach is that a cross section comparison of effective tax rates, such as is provided in almost all the studies surveyed, misses completely the important time dimension of income distribution. People who have just entered the labor market and part-time workers (often second income earners in a family), for example, will belong to a lower income group in an instantaneous comparison than if their lifetime income were considered. As each taxpaying unit passes through its life cycle, it passes through different income size groups. The introduction of this consideration suggests that more thought is needed as to the significance of calculated differences in effective tax rates (Dich; Morgan; Ruggles). This question might not be important if the researcher is solely interested in what different taxpayers pay in a specific year, but it seems relevant when the concern is with the equity of the burden distribution, given the varying needs of taxpayers who are in different phases of the life cycle (and probably have different amounts of accumulated wealth). Data difficulties may prohibit doing anything about the time dimension of income distribution, but it would seem to deserve more recognition than it usually has received.

Even when these conceptual problems are assumed away, as is usually done, it still needs to be determined what income concept will yield the most meaningful results for the purpose at hand. That this question was important was shown by Musgrave (1965), who calculated substantially modified effective tax rate structures for two different income concepts.

Surprisingly little attention has been given to this problem in the studies reviewed here, however, perhaps because the authors found it so difficult to obtain any income distribution data that they could not afford further to refine these already imperfect data in order to conform better to some conceptually preferable income concept or to test alternative concepts. Musgrave himself illustrates the point: after an explicit account of the pros and cons of alternative income definitions that might be used in tax incidence studies, he proceeds to calculate the tax incidence for ten Latin American countries relying on a distribution for Venezuela borrowed from Shoup (1959), who defines the income distributed as "private income." The data on which this particular distribution was based were obtained through manipulation of the results of a survey in which "those interviewed were shown a list of monthly income groups and asked to say in which group their own income fell" (Shoup, 1959, p. 35). It is not very clear exactly what this income concept means.

Ideally, to estimate the tax burden on specific categories of income earners it would be desirable to compute for each income earner his broadly defined income, i.e., his income defined so as to include

anything that "adds to his power to consume" (in the Simons tradition). Income would thus include money income, income in kind, fringe benefits received as personal income, gifts, transfers, capital gains, undistributed corporate earnings (for corporate capital owners), as well as that part of social security contributions which is assumed to be unshifted, and foreign income.

No study in fact adjusted for all these factors, though most made some adjustments. The line must always be drawn somewhere between those items which are included and those which are not, if only for data reasons: what matters is that the biases introduced into the final estimates by the point at which the line is drawn be explicitly noted and taken into account in interpreting the results. Few studies satisfied this requirement.

Since each particular adjustment is likely to have different repercussions on effective tax rate structures, it is therefore always important to note the precise income concept used. Capital gains, for example, are explicitly added to net national income in Herschel and stock appreciation is added to gross national product in Kaldor. These adjustments increase considerably the incomes of the upper-income groups, and, since capital gains are lightly taxed in Latin American countries, decrease the effective tax rates for these income classes. The addition of (untaxed) income in kind would presumably add income mainly to the lower-income groups and thus reduce the effective tax for these classes, though income in kind would also have to be added, for example, to the incomes of executives of corporations (Andic, 1964).

The addition of retained earnings (McLure 1971a and 1971b; Bobrowski) and the unshifted corporate income tax (McLure 1971a and 1971b) to the income of those families assumed to receive them, while not affecting the tax payments for those families, reduces the effective tax rates for higher-income groups. Similarly, for those studies that allocate the burden of social security contributions (see following section) it would seem necessary to add the unshifted portion of social security contributions to the income base of employees. In fact, although several studies analyzed the burden effect of these social security contributions, only McLure consistently adjusted the tax base for this factor.

Most tax incidence studies are interested solely in the distributional effects of the revenue system on the residents of a particular country. The data must therefore be adjusted for income accruing to nonresidents and for the taxes borne by that income. In the same vein, foreign income that accrues to residents ought to be included in the income concept used to estimate effective tax rates. The omission of this last adjustment was explicitly acknowledged by Taylor although no other study mentioned it. Where the income distribution data include income that accrues to foreigners but the estimates of total taxes exclude the taxes borne by foreign income,

an underestimation of the taxes borne by residents results (Bhatia; McLure 1971a). Where both income and tax estimates include amounts which should be imputed to nonresidents, some distortion of the effective tax rates will result unless the income that accrues to nonresidents is distributed in the same pattern over the income size classes as income that accrues to residents, which seems unlikely.

Government transfers may for many purposes be considered to be negative taxes. However, when effective tax rates are estimated it seems better to include transfers with government expenditures rather than deducting them from taxes. The exercise of estimating effective tax rates under the differential incidence methodology assumes the structure of government expenditures, including transfers, is unaltered, so that it can be argued that these transfers should be included in the income base. This inclusion occurs when personal income (Bird, 1970a; Bobrowski; Brady) or disposable income (McLure, 1971b) is distributed among the different subgroups considered. Studies using consumer survey data (Gillis; Levin; Lovejoy; Taylor) also tend to include transfer payments in their income data. However, the use of net national income data leads to the exclusion of those transfer payments from income data (Consejo Federal; Herschel; Kaldor; Taylor). The use of adjusted gross income as reported on tax returns (Andic, 1964) also excludes transfers, which are exempted from tax in Puerto Rico. Where transfer payments are important, their omission from the income base of the lower-income classes will tend to overstate the effective tax burden of these classes, although this bias may not be too serious in Latin America.

Several studies use tax return data (Andic, 1964; McLure, 1971b; Sahota, 1968 and 1971), as sources for their data on income distribution, and/or tax payments for the subgroups considered. An adjustment has to be made in these cases for underreporting, nonreporting and nonpayment of assessed taxes. Some adjustment for these factors was in fact made in Sahota (1971) and McLure (1971b). Sahota (1971) for example, took into account "a rough average of tax evasion from incremental incomes, as translated from the income tax brackets to the family budget income classes" (pp. 443-444). McLure obtained estimates on underreporting of taxable returns by comparing the estimates of reported income obtained from tax returns with national income accounts (p. 243). Several methods of estimating tax evasion are reported in Oldman and Holland; this study also illustrates the fact that the tendency to underreport or not to report income depends on the income size group and on the source of income. Further analysis of these factors should yield better correction factors for studies which attempt to construct income distribution data using tax returns as primary data sources. The unadjusted data are usually inadequate to support generalizations with respect to the distributional effects of taxes (Andic, 1964).

Where the main data source for a tax incidence study is a consumer survey, income tends to be approximated by adding consumption to saving (Gillis; Lovejoy). Family consumption tends to be less variable than family income because lower-income classes contain a certain number of families with negative transitory incomes while higher-income classes include a certain number with positive transitory incomes (Friedman). A given distribution of tax payments expressed as a proportion of permanent income (consumption plus saving) for different income classes will therefore yield more progressive rates than if these tax payments were expressed as a share of annual income. For different purposes, either presentation may be the more suitable.

Consumer survey data were also the main source in Levin's study on sales tax incidence in Colombia, including the income data reported by the interviewed households. This use of the reported income data will provide a more progressive effective tax rate structure than if income data were computed by adding reported consumption and reported savings (as was done by Gillis and Lovejoy).

Most studies surveyed used the family as the unit of analysis on the grounds that this unit is the most interesting one in relation to income distribution and tax burden, or because the data available pertained to families. McLure, on the other hand, used an income distribution by individuals (1971a) and income earners (1971b) because no alternative was available. The use of individuals instead of family units alters the pattern of income distribution (and thus the effective tax rates estimated) because some families are not headed by an employed income earner while others have more than one income earner.

Finally, it deserves emphasis that all the tax incidence studies borrowed income distribution data or constructed their own using sources gathered to serve other specific purposes (price indices, consumption surveys, or national accounts). Differences in the income data used and in the adjustments made to these data in the process of preparing them for use in the incidence studies influenced the results in various, largely unspecified, ways. This factor makes intercountry and interstudy comparisons extremely hazardous. The sensitivity of such tax incidence patterns as those displayed in Table 2, for example, to alternative income concepts and variations in other assumptions is striking, as is demonstrated in a companion study (De Wulf).

### Tax Coverage

Most of the studies covered in this survey have tried to be as comprehensive as possible in their consideration of taxes to be allocated. Four studies were by purpose, however, only partial studies, i.e., two on sales tax incidence in Chile (Gillis) and Colombia (Levin); one on corporate profit taxes in Peru (Brady); and one on Puerto Rico (Andic, 1964), which analyzed separately (for the methodological reasons discussed in Section II) the incidence of personal income taxes and of indirect taxes.

Import duties, which affect the real income of the consumers of the imported and related products on one hand and the incomes of producers of the goods on the other hand may clearly have a marked income distributional impact beyond that measured by the revenues collected. This point was briefly discussed by Wallich (p. 136) and Taylor (p. 228) and constituted the main topic of a note by Schydrowsky. In general, however, the undoubted effects of protective policies on incomes would not seem suitable for inclusion in an analysis of tax incidence since they do not result in budgetary revenues.

Most studies tend to be comprehensive in their coverage of taxes. Social security taxes, however, were explicitly excluded by some authors (Bhatia; McLure, 1971a). Other authors, noting the rather unique nature of social security contributions as nonvoluntary payments to a kind of insurance system, estimated effective tax rates both with and without inclusion of contributions to the social security system (Herschel; Sahota, 1971). A third group simply considered social security contributions to be the same as any other tax (Bobrowski; Kaldor; Adler). In view of the numerous institutional variations in both the financing and the provision of social security in different countries (Forget, chapter 4), the appropriate treatment of social security taxes cannot readily be determined by a general rule: in most cases, alternative estimates with and without social security contributions would appear to be the safest policy to follow.

The inclusion of fees also varied from study to study. Although in theory it is usually easy to distinguish between a fee or charge for a government service and a tax, it often proves harder to do so in empirical studies. In any case, there was no uniform treatment of fees in the studies reviewed here. Similarly, while profits accruing to the government from the operation of a multiple exchange system were included with other government revenues by some authors (McLure, 1971b; Consejo Federal), others excluded it (Taylor; Bird, 1970a). The profits of liquor monopolies and government lotteries also require careful treatment and are significant in some countries.



Finally, of particular interest in Latin America, the incidence of the government deficit (viewed as a contributing factor to inflation) was analyzed in two studies (Herschel; Sahota, 1968). The problem with this approach is that it is difficult to know where to draw the line. Deficit financing adds to budgetary revenues and thus is a legitimate candidate for analysis from one point of view. On the other hand, the incidence of the deficit is conceptually and empirically extremely difficult to determine, especially in view of the numerous changes in asset values associated with inflation. As a general rule, it would seem better to avoid this morass, recognizing that doing so reduces the potential scope of any conclusions on the redistributive effects of government fiscal policy while probably increasing the reliability of the analysis as a whole.

As indicated earlier, most tax incidence studies are interested in measuring the burden of the tax system on residents. An appropriate adjustment of total taxes levied in the country to exclude taxes borne by nonresidents is thus required. Taxes borne by nonresidents could include some or all export taxes, excise taxes paid by nonresidents (e.g., tourists), the unshifted portion of the corporation profit tax where capital is foreign owned, and the shifted part of corporate profit taxes that falls on exported goods. McLure, (1971b), Lovejoy, and Webb excluded taxes assumed to fall on nonresident capital from the total taxes allocated to national income. The absence of such an adjustment was acknowledged by Bhatia and Taylor, although the former "excluded the withholding tax from the tax burden because it falls on non-residents" (p. 10). Export taxes were excluded by Sahota (1968) on the assumption that they were all borne by foreigners, which seems rather implausible in the Brazilian case. Other studies, however, treated export taxes as falling on domestic income. These assumptions with respect to shifting will be further considered immediately below.

All studies which considered the tax incidence of more than just one tax encompassed all different taxing jurisdictions in their analysis, and some singled out the effective tax rate structure of the different jurisdictional levels (e.g., McLure, 1971a).

#### Incidence Assumptions

As explicitly acknowledged by most authors of the studies surveyed, the incidence assumptions adopted in their papers have a considerable bearing on the results obtained. Because these results may be sensitive to the use of alternative assumptions, extreme care should be given to the assumptions actually used. The state of the art of incidence theory, however, is very unsatisfactory, and it is not, perhaps surprising to find that the methodology used in an early study by one of the authorities in the field (Musgrave, 1951) has often been simply copied. Reference to the specific shifting assumptions used there or in some other study of a developed country permitted a quick and welcome escape from theoretically unsatisfying conceptualization to the realm of superficially more real statistical estimation.

Some authors who were dissatisfied with the applicability of the generally accepted shifting assumptions to the quite different economies of particular Latin American countries did not feel able to choose any particular assumption as more realistic. Adler and Wallich, for example, in two of the earliest tax incidence studies in Latin America, estimated the results using alternative shifting assumptions such as 50 per cent shifted forward and no shifting for the corporate profit tax (Adler) and, for export taxes, no shifting and 50 per cent backward shifting to the incomes of agricultural producers (Wallich). The results of the use of these alternative shifting assumptions, however, were "the modified assumption does not change the basic character of the results obtained" (Adler, p. 141) and "the results are not materially changed" (Wallich, p. 134). By way of contrast, when Schultze (p. 445) used different shifting assumptions with respect to property taxes in the United States, the results proved very sensitive to the assumptions: on the one hand, assuming property taxes to fall on capital resulted in the effective tax rates being U-shaped and highly progressive at the upper end of the income scale; and on the other hand, assuming them to be borne by renters and consumers yielded a consistently regressive pattern of effective tax rates. A somewhat similar conclusion was found by Musgrave (1951), who investigated six different shifting assumptions for the corporate profit tax and three for the property tax. McLure (1971a) also reports that different shifting assumptions would have made his estimated tax rates proportional, rather than progressive. There is some evidence that the results in other studies are equally sensitive to variations in crucial incidence assumptions (De Wulf).

All studies, without exception, assumed individual income taxes not to be shifted, "following generally accepted practice" (Musgrave, 1951, pp. 13-14). Although Musgrave (1951) suggests several possibilities for shifting this tax, twenty years have lapsed and no study has even attempted to carefully investigate any of these possibilities, let alone allow for them in the estimates. A similar comment can perhaps be made with respect to the strikingly uniform treatment of social security contributions and the inheritance tax.

The corporate profit tax, on the other hand, has been analyzed under a variety of shifting assumptions. At one extreme there are some studies (Bobrowski; Consejo Nacional; Kaldor; Musgrave, 1965; Wallich; McLure, 1971a; Brady) which assume no shifting of this tax. While several studies adopt this procedure without giving any reason, others bring forward some arguments for it. Wallich, faced with a serious statistical problem because corporate profits were lumped together with individual incomes in the available statistics, contended that the "likelihood of shifting (of corporate profit taxes) is relatively small because corporations must compete with partnerships where any shifting of the income tax is relatively unlikely" (p. 123). McLure (1971a, p. 34n) took the argument of imperfect competition--on which others (see below) based their forward shifting arguments--to an extreme: "The assumption that

the corporation income tax is not shifted is based upon the view that in the thoroughly monopolized parts of the economy profits would have been maximized in the absence of any tax." He admits, however, that "time did not allow either a detailed analysis of the likelihood of shifting the tax or the construction of estimates for alternative assumptions about the incidence of the tax."

The other studies assumed that various proportions of the corporation profit tax were shifted forward in higher consumer prices. The proportions assumed to be shifted range from one third (Sahota, 1971) to one half (McLure, 1971b; Adler; Lovejoy; Taylor) to two thirds (Bhatia; Herschel). The forward shifting assumption was generally defended by referring to the noncompetitive market structures in the countries studied (Bhatia; Lovejoy). Nowhere in the studies surveyed was a 100 per cent shifting assumption adopted, however. In view of the results in some studies on the United States (Krzyzaniak and Musgrave) Germany, (Roskamp) and India (Lall; Laumas), which suggest full shifting of the corporation profit tax, the absence of a full shifting assumption among the great variety of assumptions used is curious. While these results have been challenged for the United States (e.g., by Cragg *et al.*) and for India (Rao; Gandhi), it would still seem as valid on the basis of existing evidence for Latin America to assume full forward shifting as some other arbitrary percentage, and it is rather surprising that no one appears to have done so.

Only one study mentioned the possibility of backward shifting of corporate profit taxes (Lovejoy). He rejected this possibility, however, arguing that the unionization of labor in Jamaica strongly limited this possibility. Backward shifting of these taxes to other factors of production was not considered by anyone. In view of the importance of profit taxes on export industries in some countries, it is curious that more attention has not been given to possible backward shifting.

Excise taxes and other indirect taxes are almost unanimously assumed to be shifted forward. Two minor exceptions are for Guatemala, where 10 per cent of customs duties were assumed to be unshifted (Adler), and Colombia, where one third of motor vehicle taxes were assumed to be unshifted (Taylor). In general, however, the authors of the studies surveyed agreed with the conventional wisdom on this question, as stated, for example, in Due. Due, however, mentions some exceptions to this forward shifting rule, noting that "the significance of those exceptions will vary with the circumstances of the country and are impossible to ascertain even for a particular country" (p. 3). The possible importance of these exceptions has been noted in Pakistan (Radhu) and Colombia (Bird, 1970b, p. 110). Musgrave (1965, p. 46) also ignores backward shifting of excise taxes on the ground that "if it can be assumed that the size distribution of income originating in various industries is the same, changes on the income sources side may be safely neglected," because "our task is not to determine the distribution of tax payments by individuals, but to estimate the resulting changes in the size distribution of income."

But is it safe to make this assumption for developing countries? No one appears to have looked further than this authoritative citation.

Finally, the shifting assumptions adopted on property and wealth taxes also varied. Some studies assume no shifting (Consejo Federal; Herschel; Wallich; Musgrave, 1965), while others allowed for some forward shifting of the property tax on rental property. The proportion of this tax that is assumed to be shifted forward varied greatly from study to study: for example, McLure (1971b) assumes the taxes on business property (76 per cent of the total) to be shifted forward for his Colombian study, while only three eighths of the total property tax was similarly treated in Taylor. No one appears to have considered the implications for incidence analysis of the phenomenon of tax capitalization, in which tax changes affect wealth holdings at the time they are made, although some recent U.S. studies suggest these implications may be significant (e.g., Smith, chapter 6).

The paucity of data, combined with the lack of definitiveness in incidence theory, perhaps explains why few of the authors of the studies reviewed here elaborated at any length on their shifting assumptions. Some did not even explain their assumptions at all. The results of the studies surveyed, each of which reflects a peculiar combination of shifting assumptions, should thus be viewed with extreme caution--and probably compared not at all.

## II. Some Conceptual Problems

A number of serious statistical difficulties which hamper attempts to measure the incidence of the tax system in developing countries have been noted in the previous section. The problems with studies on tax incidence do not stop there, however. They go much deeper--so deep, indeed, that some have questioned whether the game is worth the candle at all. This section discusses briefly some of the conceptual arguments which point toward this negative conclusion.

### Meaningfulness of the exercise

One of the best of the recent studies of tax incidence in Latin America has argued that "without knowledge of the effective incidence of existing and potential taxes, it is not possible to know how either existing or proposed taxation corresponds with society's views of equity. An ideal of equity in taxation is of little use if the incidence of taxes can not be compared with that ideal, with the goal of modifying the existing system to bring it more nearly in line with the ideal" (McLure, 1971b, p. 239). This position is certainly appealing in many respects, although it should be noted that it is not necessarily identical to the view that the purpose of these studies is to measure the distributional impact of tax policy. More important, one can argue at least as convincingly that statistical studies of tax burden have, in most instances, little to do with measuring the deviation of reality from an ideal of equity and in fact do not even display the effective incidence of taxes.

By now, for example, it should be clear that the results obtained in these studies are heavily dependent on the kind of income data used, the particular taxes allocated, and the precise assumptions used in distributing the tax burden over the different income classes or other groupings of the population. Substituting one income concept for another can result in a tax rate structure that looked progressive becoming proportional or even regressive; the same is true with respect to some assumptions concerning shifting of taxes (De Wulf). The warnings most authors give concerning the nondefinitive nature of their results should thus not be ignored, as is usually the case after the initial pro forma mention of them, but underlined.

To put this point at its strongest, it can be convincingly argued that the usual statistical calculations of tax burden are virtually without merit as a basis for policy formulation. Conceptually, as Shoup notes in his recent treatise, "the distribution of total burden under any one tax system is an invalid concept; it assumes what is either untrue or meaningless, namely, that the existing distribution of income-before-tax would remain unaltered if the tax system did not exist" (Shoup, 1969, p. 11). Calculations which assume a situation which is not only untrue but impossible must, to say the least, be regarded with a certain degree of skepticism.

What does it mean to be told, for example, that the lower-income groups in Colombia pay from 12 to 13 per cent of their income to the Government in taxes while the highest income groups pay 15 to 20 per cent (McLure, 1971b, p. 256)? In one view, almost nothing. Even the comparisons of alternative burden distributions which Shoup considers useful in some cases as a guide to policy are, it may be suggested, unlikely to be of much use in developing countries in view of the wide differences in the size distribution of income among industries and the consequent virtual certainty that any wholesale tax substitution will alter the distribution of pretax incomes (Prest, 1955). The impact of a marginal change on income patterns may of course be analyzed in the conventional fashion, but there seems to be no merit in pretending that in doing so one is comparing the entire distributional effect of two alternative tax systems.

Most careful studies of these matters note these problems and then proceed to ignore them. Why? Three reasons may perhaps be suggested. The first is the phenomenon of number magic, or the idea that describing an assumed phenomenon with numbers somehow makes it more real and subject to control, a disease to which the training of economists makes them particularly likely to succumb. To be fair, however, one should note that economists often perform these exercises at the behest of political decision makers who themselves feel the need for simple "hard" (even if invalid) descriptions of complex phenomena.

Another reason may be as a result of the well-known international tax league syndrome, or the belief that quantitative international comparisons somehow establish standards of reference or at least set limits of possibility as to what can be done in any particular country. Unless one has a very strong deterministic view of the developmental process, however, this belief seems highly suspect (Bird, 1970e).

Perhaps the major reason for these exercises, however, is the desire to provide quantitative, and therefore supposedly definitive, support for particular policy positions--which usually means to demonstrate the case for a more progressive tax system. A number of comments must be made in connection with this worthy end, however.

The measurement by fiat which largely (and inevitably) characterizes most burden studies generally reveals nothing about the tax system which has not been assumed to start with. Consideration of the formulas employed to allocate taxes among income classes in the various studies reviewed here, for example, suggests that most of the allocations made in these studies are surprisingly similar in view of the often different economic circumstances of the countries concerned. Indeed, studies of Latin American countries tend to employ assumptions on the incidence of the corporate income tax, indirect taxes, and property taxes which are generally similar to those used in the pioneering studies in the United States and other advanced countries (Recktenwald), despite the substantial differences between these economies. That this is so, is not, of course, too surprising in view of the underdeveloped state of incidence theory. It is generally easier--and often, in fact, as useful--to refer (or defer) to prior authority than to grapple anew with the intractable conundrums of tax incidence theory.

More importantly, the conclusions which emerge from this kind of analysis basically depend upon two factors--the assumed incidence and the tax structure. Since most authors tend, for want of anything better, to assume more or less the same pattern of incidence, what many burden studies really reduce to is a critique of tax structure. Since most Latin American countries rely mostly on indirect taxes, it is thus expected that their tax burdens will be regressively distributed for the most part--and so they often turn out to be in these studies. That is, to oversimplify only a little, income taxes are almost invariably assumed to be distributed progressively with income, while indirect taxes are generally assumed to be distributed regressively, if only because consumption falls as a proportion of income as income rises. The overall progressivity of a tax system calculated by this method therefore depends, to a large extent, on the importance of the personal income tax in the total tax mix. Neither the particular distribution of income employed nor any individual peculiarities of the allocation formulas appear to affect the results of this sort of study as much as does the composition of the tax structure.

The point may perhaps be illustrated by referring to an earlier (and very simple) study of Colombia by one of the present authors (Bird, 1970a), which assumed that the entire personal income tax was paid by the highest income quartile. Clearly, if all other taxes were replaced by this tax, the Colombian fiscal system would look as progressive as any one could possibly want. While exaggerated, this example serves to illustrate the point that what we are in effect often doing when we calculate the incidence of a country's tax system is simply to display in a different fashion the readily ascertainable facts on the composition of its tax structure. This display may be useful for some purposes, but it should not be taken to reflect anything more real than the assumptions upon which it is based.

The better studies, of course, examine the details of the structure with sufficient care to see, for example, that sales taxes are not always necessarily regressive. For Panama, for instance, it was found that taxes on food were regressive, taxes on tobacco and alcoholic beverages were first progressive and then regressive, and taxes on jewelry, perfume, and crystal were highly progressive (McLure, 1971a). Total commodity taxation in Panama--a weighted average of these individual taxes--was then progressive in the lower-income classes, proportional in the middle-income classes, and substantially regressive for the higher-income group. In Colombia, a somewhat similar situation was encountered: while customs duties were found to be progressive, total commodity taxation was substantially regressive as a result of the regressive features of the taxes on tobacco and alcohol (McLure, 1971b). A study of Chile, on the other hand, estimated the incidence of the sales taxes to be progressive because of exemptions and the consumption pattern, with families from higher-income groups consuming more of those items which were taxed at higher rates (Gillis).

These conclusions are useful and not intuitively obvious. One must go through the arithmetic exercise in order to derive them. On the other hand, nothing much is gained by aggregating the results of these and similar exercises for other taxes into a burden table, nor does this form of presentation necessarily add anything to our understanding of the system, although it may perhaps make it easier to explain that understanding to others, at the risk of conveying a spurious impression of the extent and accuracy of our knowledge.

In view of the apparent importance in most analyses of the tax mix and the basic assumptions, to put it rather crudely, that indirect taxes are fully shifted forward and direct taxes on persons are not shifted at all, it is worth noting again that these assumptions are in fact questionable in the circumstances of many developing countries, where Prest's well-known criticisms (Prest, 1955 and 1968) on the logical inconsistencies of these two propositions--one of which really assumes factor supplies are perfectly elastic while the other assumes they are perfectly inelastic--appear to have merit. Only Andic (1964) appears to have taken these strictures seriously: while

he estimated the incidence of personal income taxes and of indirect taxes by income class, he refused to add these together on the grounds that "it is impossible to establish statistically the incidence of different taxes on different income groups" (p. 118).

In reality, neither extreme conventional assumption is likely to be true, so that, for example, all indirect taxes are not unlikely to be shifted forward, analytically convenient though it usually is to neglect this point: the different time dimension of various incidence assumptions is another troublesome problem in this area. For example, direct personal taxes probably are shifted at least in part over time. This conclusion often seems to surprise people, though there is no reason why it should, since it has long been accepted, for example, that differential taxation of income streams is likely to affect occupational choice (Goode). There can be no question that the income tax in less developed countries impinges very differently on different incomes, whether earned or unearned, for both structural and, especially, administrative reasons. Kuznets' suggestion (pp. 2-3) that effective progressive income taxation is likely, over time, to lead to compensating adjustments in the pretax distribution of income is another manifestation of the same line of thought.

In these circumstances, it might seem that attempting to correct inequalities, at least those in earned income, through taxation amounts to chasing a will-of-the-wisp. This view is overdrawn, however, since taxation can affect both the distribution of wealth (and hence of property income) and, through affecting factor prices, the mix of factors employed and consequently the distribution of earned incomes (Bird, 1972). The direct progressive personal income tax may, in some Latin American countries, be neither direct nor progressive nor personal, but this does not mean that the tax system is necessarily completely ineffective as an income redistributor. The point here is that our knowledge of these matters is simply too inadequate to permit us to measure its redistributive impact with any confidence.

#### Rationale of burden studies

There can thus be little question that the common construction of tax burden tables is, as a rule, a conceptually and statistically dubious exercise. It is therefore rather puzzling why such calculations are so common. The answer may simply be that, to some extent, this quantification of the hypothetical implications for income distribution of the standard incidence assumptions may serve the important negative purpose of discrediting even more unfounded views about the progressivity of the tax systems (based usually on the rate structure of the personal income tax while neglecting the bulk of the tax system) which are commonly propagandized in most countries by interested groups. This aim is surely a worthy one. It therefore seems unfortunate that tax burden studies appear in fact to have had as yet little effect on public opinion (always a treacherous concept) concerning the nature of the tax system.



In no country, for example, have more burden studies been made than in the United States. Almost without exception, every study which has been made in the last thirty years has shown that the U.S. tax system is highly regressive in the lower-income range and over the total of incomes is at most U-shaped (Recktenwald). Nevertheless, the positive impact on public attitudes to redistributive policy and taxes of repeated demonstrations that half or more of the (nontransfer) income of the very poorest groups in the U.S. are apparently paid in taxes appears to have been negligible. It seems unlikely that the more recent thinking on property tax incidence reflected in, for example, the Schultze estimates cited earlier, which calls this traditional result into question, has been influential in shaping this unreceptive attitude. Two other reasons for this apparent ineffectiveness may perhaps be suggested.

The first is that the results may simply not be believed because they do not accord with what people want to believe or with their common sense or subjective attitudes to taxation. That this may be the case is suggested, for example, by such trends as the current revival of populist sentiment for tax reform in countries such as the United States where we once again see, as de Jouvenal (p. 24n) well put it twenty years ago, that "many of those who denounce the disproportionate share of the 'upper tenth' are blissfully unconscious of belonging to it." It is a cliché to say that to most people tax reform means reforming the other fellow's taxes; but it is perhaps truer to say that many people resent not tax inequities, but taxes, period, and that they do so in part at least because they feel increasingly dissatisfied with the performance of governments (Kristol). The increasing weight of taxation in the industrial countries as a result of rising expenditures and inflation has clearly greatly increased popular sensitivity to taxes, especially to those taxes of which people are most aware (Bird, 1970d). Similar forces, of course, are at work in shaping the attitudes, and reinforcing the prejudices derived from vested interests, of the educated classes which constitute public opinion in Latin America toward taxes and tax reform.

Related to this line of thought is the inherent subjectivity of concepts of tax burden. In a sense, what one is really attempting when measuring something called tax burden is to objectify an inherently subjective concept. As Buchanan (1969, pp. 52-55) has noted, individuals may prefer an inefficient tax system despite its higher costs to them, because, for example, taxation through excises leaves them a wider range of options or because they may agree with the sumptuary purpose of lowering the consumption of particular goods. These ideas on the differing distribution of tax burden when viewed from different perspectives have received substantial support in recent years in several studies (Tanzi; Bracewell-Milnes), which suggest that it may be possible to quantify at least to some extent the subjective burden of taxation--and, more important, that this burden is likely to look rather different than that which emerges from the more usual objective studies of tax burden.

As Amotz Morag (p. 21) once put it, "an important factor in the realities of the limits of taxation are the psychic costs of paying tax, costs which politicians will carefully heed because they are clearly relevant to the prospects of re-election. Economists should heed them too." It seems clear that economists have unduly neglected the importance of fiscal psychology and of political reality in designing tax reforms, particularly those aimed at altering the progressivity of the tax system. Such intangibles as tax tension, tax sensitivity, tax consciousness, tax awareness, tax visibility, and tax illusion, all of which phrases appear in the scanty relevant literature (Buchanan, 1967, chapter 10) need to be much more closely considered than has been the case to date if economists are to contribute more usefully to the evolution of tax policy in developed or less developed countries. Whatever the objective merits of these popular attitudes, they deserve more careful consideration by reform-minded tax experts than they have generally received, since they seem to be more important factors in shaping the direction and outcome of tax policy efforts than many of the more objective exercises in which economists customarily engage (Bird, 1970d).

A second point limiting the influence of burden studies may be that few people anywhere seem much interested in reducing inequality simply for the sake of reducing it. Nor is it entirely clear that this attitude is mistaken. Any attempt to determine the appropriateness of the distribution of the tax burden must, at base, rest on some conception of social justice, as indeed, must concern with the degree of inequality in income distribution as such. Yet, in practice, the reasons why we are, or should be, concerned with inequality per se are seldom articulated. One reason for this obscurity of aim may be that most writers have simply never thought through the implications of their egalitarian bias (Lampman). The most common justification for progressivity in taxation, for example, is probably in terms of the ability-to-pay doctrine, a doctrine which, at best, seems to be one of those attractive generalizations which can not be pressed very far before it disintegrates. A more useful approach to the problem would appear to be to judge the desirability of any particular tax change in terms of its likely effects on income distribution, if that is what interests us, and not by its degree of agreement with some vague notion of propriety or impropriety (Bird, 1967). There is no magic shortcut which enables tax policymakers to avoid facing up to the real issues of social policy on income distribution.

Even more relevant to the present discussion is the argument that most people are not concerned with inequality as such at all: rather their concern is with the extremes of the income distribution (Rawls, chapter 5). The real concern of social reformers, for example, is usually, and in general surely properly, with reducing the power of the rich on the one hand and improving the living standards of the poor to accord with some notion of an acceptable social minimum on the other (Bird, 1967). While Lorenz curves and Gini coefficients

are useful measures for many purposes (Hainsworth), they are not as useful in depicting the redistributive impact of tax systems as is sometimes thought, because they are not very sensitive to the changes at the extremes of the income distribution which may be most interesting to policymakers (Polinsky; Bracewell-Milnes). Some studies of income inequality and of the ameliorative effect of the fiscal system on that inequality thus do not seem to be focused adequately on the relevant problems of the extremes, especially when undue attention is paid to compressing information into a single simple measure.

### III. Statistics and Policy

The previous section cast doubt both on the meaningfulness of tax burden tables such as those constructed in the studies reviewed in this paper and on the usefulness of these tables as guides or spurs to policy action. This critique of statistical calculations of the burden of the tax system is not meant to deny, however, that as good data as we can get on income distribution will help in policy formulation. Instead, our intention has been to suggest that the use of these data to produce fundamentally rather dubious estimates of the burden of the total tax system by size classes is usually a relatively unrewarding exercise. If, as suggested above, our principal concern in designing redistributive tax policy is usually to reduce the concentration of income and wealth at the top of the pyramid, it is not particularly important what the present computed burden of taxes in the fifth decile is as compared with the sixth. The important matter is that this concern in itself reflects the judgment that the rich are not being taxed adequately. What matters in this case is thus that the tax system be altered to tax the well-to-do more effectively, not what proportion of their income is hypothetically taken by the present tax system. It is not really necessary to know anything about the data in order to reach this policy conclusion, and the policy conclusion does not, we think, receive much support either in real or publicity terms from the usual statistical presentation of tax burden tables. Nevertheless, these calculations may be useful in some respects, and their usefulness can be improved. This section suggests a few ways in which the statistical ingenuity devoted to tax burden calculations might perhaps be adapted to produce a higher policy payoff.

Income distribution in Latin America is clearly very unequal (United Nations). Fiscal policy--government revenues and expenditures--has traditionally been regarded as an important instrument for effecting any desired redistribution of income. Latin American tax systems do not appear to do very much in this respect, according to most of the studies reviewed here. With due regard to the inherently dubious value of statistical estimates of effective tax rates, we may mention that of the studies reviewed here only four suggest clearly that the tax system of the country study results in some mild income redistribution

(Lovejoy; Bhatia; McLure, 1971a; Webb). Since Table 2 includes these four studies, it gives a somewhat misleading view of the results of the entire group of studies, most of which unfortunately do not lend themselves to tabular summary. The results of most other studies suggest mixed pictures of rough proportionality and even regressivity over large segments of the income size class distribution. Although no author has suggested what a satisfactory income distribution should be or what a satisfactory pattern of effective tax rates would look like, everyone seems to be in favor of a progressive tax rate structure. The policy conclusion of most studies is clearly that more progression is needed in the tax system in order to obtain a more equitable tax system and greater income redistribution.

Only one study, however, explicitly established a standard of progressivity which could be used as a yardstick for evaluating the present system. In the light of the prevailing income inequality in Brazil, Sahota (1968) proposed  $t=(y-s)^{1.5}$  as the desired tax function, where  $y$  is per capita income,  $s$  is subsistence income, and  $t$  per capita tax payments. Since his effective tax rate estimates indicated the present Brazilian system resulted in proportionality or even regressivity, he did not feel that it was important to indicate explicitly just what an equitable tax system would look like before advocating greater progressivity.

Considering this matter from another angle, the usual calculation and comparison of effective tax rates by income class really takes proportionality as the relevant standard of comparison--a position which seems odd in view of the underlying utilitarian framework of this sort of analysis (Rawls; Lampman). It would appear more sensible to adopt some sort of progressive norm in interclass tax comparisons, as has often been done in intersectoral (Gandhi, 1966) or international (Bird, 1964) comparisons, rather along the lines suggested by Sahota (1968). The rationale for adopting this procedure would be precisely to get a closer approximation to the burden of taxes on the grounds that paying a certain proportion of income in taxes is more burdensome to a poorer than to a richer man. In view of the doubts we have expressed on the usefulness of such calculations, we are not prepared to push this idea very far, but some of the issues at stake in these calculations might be clarified if all authors postulated explicit progressivity norms as standards to which to compare the present or proposed systems.

When burden studies are extended beyond the tax system, the confusion and uncertainty noted above multiplies. As already mentioned, for example, there are many government policies ranging from deliberate inflation through public pricing to multiple exchange rates which may supplement, complement, or replace those policy instruments which are conventionally labeled taxes. Different analyses take these measures into account to quite different extents. The more one is interested in the impact of government policy on the distribution of income, the wider one's net should presumably be cast--but the more likely it is

that the results will in fact be analytically meaningless because of the increased unrealism of the assumption that the ex-government distribution of incomes is the same as the cum-government distribution.

Taxes cannot, of course, make poor people rich. If our main concern is with poverty as such, with the waste and misuse of human resources, and the stunted opportunities of those whose incomes fall below some minimum decent standard, remedies must come primarily through the expenditure side of the budget, either by direct public provision of such services as housing, medical care, and education, or by simple transfers of income, or through employment-creating policies. If the principal aim of redistributive policy is to level up--to make the poor better off--the main role the tax system has to play is thus the limited and essentially negative one of not making them poorer. This is, of course, the traditional argument against heavy taxes or mass consumption goods and the like. It is also a reason for considering explicitly the distributional effects of public expenditures, as a number of studies have recently attempted to do.

The study of government expenditure incidence rests on even more uncertain premises and hypotheses than the investigation of tax incidence. However, several studies have tried to include this aspect in their analysis of tax incidence in order to provide an estimate of total budget incidence (Aaron; Adler; Consejo Federal; Bhatia; Wallich; Meerman). Several studies have attempted more specifically to estimate the incidence of government expenditures by income size groups (Sahota, 1972; Urrutia; Manrique). The conceptual problems inherent in this kind of study are very great, as can be imagined. There is, for instance, no measure of output for most public sector activities, so that what is done in these studies is not to allocate benefits but rather the cost of inputs which are assumed to produce something (Bird, 1970c). Furthermore, the conventions on expenditure incidence are not nearly as generally accepted as those on taxes. Some authors attempt to avoid this problem by not even attempting to allocate difficult expenditures (Bird, 1970a). Most, however, proceed to allocate such items as defense expenditures either by income or per head, in either case without much rationale.

In any event, the general results of these studies are that specific government expenditures (e.g., agriculture, education) as opposed to general expenditures (e.g., military, justice) tend to be distributed in a regressive pattern (pro-poor) while the general expenditures are assumed to be distributed more proportionally. Subsequent work with U.S. data has suggested that the distributional effects of general expenditures may even be progressive--that is, pro-rich (Aaron and McGuire, 1970; Maital).

Although this last point may be a little overdrawn, there does appear to be an emerging consensus that many government expenditures in developing countries are largely progressively distributed by

income class, with the urban middle class perhaps benefiting most. Again, however, it must be noted that this conclusion emerges from an examination of the specific government activities in question and really has little or nothing to do with incidence studies. The latter do not support the former; they derive from it. Even if it comes to be conventional wisdom that, say, educational expenditures in Latin America tend to benefit only the upper quartile of the income distribution, what this means is that the apparent progressivity or regressivity of the expenditure side of the budget, like that of the tax side, will come to depend more on the composition of expenditures and less on the analyst's possibly idiosyncratic allocation formulas. The basic conceptual problems with this analysis will remain: they are explored further in De Wulf.

Another point perhaps worth comment is that the usual statistical study on tax burden amounts to a snapshot of a dynamic process. The concept of equity conventionally applied in appraising the results of such studies is similarly a concept of instantaneous equity. Yet, as already noted, we know that the distribution of income and assets among individuals at any point in time depends in part on their ages, so that any cut across this dynamic process will reveal a picture which may be misleading in part. While this problem may be less serious in the developing countries than in the developed if it is thought that the higher income groups are better able--for example, because of their control over investment in human and physical capital--to perpetuate their positions, it is still a problem. It appears that more attention to the dynamic incidence of tax systems and its relation to static progressivity is needed, along the lines suggested by Dosser some years ago. In particular, focusing on changes in income over time brings out the very substantial importance of the initial distribution of wealth, human and nonhuman, which in turn suggests one obvious focus for redistributive tax policy (Atkinson; Bird, 1972). Empirical work on this subject would be very difficult but potentially very rewarding.

Where a comparison of tax burdens between two different time periods is made, interesting policy conclusions may sometimes be suggested. Argentina's tax burden pattern, for example, was studied for 1959 and 1965 using the same methodology in both years (Programa Conjunto; Bobrowski). The fact that the estimated regressivity of tax rates was accentuated between 1959 and 1965 is more meaningful than the simple fact that under a given methodology the effective tax rate structure at a point in time was found to be regressive. It illustrates, for example, that changes in the tax mix over this period are assumed to have had, if anything, a perverse redistributive effect. Webb's recent study of Peru is particularly suggestive in its use of intertemporal comparisons. This intertemporal approach to burden studies may become even more significant if recent information concerning a

widening income inequality in some Latin American countries is confirmed and generalized (Weiskoff; Fishlow). What has happened to the fiscal system over this period? Intertemporal tax incidence comparisons in the same country may thus provide a more useful guide to policy and a better investment of scarce research resources than still more snapshot estimates for a single year in different countries.

As noted earlier, most studies refer to the tentative nature of the results, which cannot be any better than the data (and assumptions) on which they are based. One is often left with the feeling that the results of most studies might have been anticipated by the authors after analyzing the total tax structure and other features of the tax system, as was done by Andic (1968) for example. Chile's sales tax, was for instance, found to be slightly progressive by Gillis, contrary to conventional wisdom. The exemption structure and the sales tax rate structure, as well as the high spending habits of the Chilean high-income families, were among the reasons given to explain the progressive nature of the sales tax. These factors were, of course, known to the author before he made his study and might have led him to anticipate these results. Nevertheless, the detailed quantification of such intuitions and of the appraisals of informed observers may sometimes aid others in the attempt to press for tax reforms that would help make effective tax rates more progressive. Similarly, the extent of the nonprogressive nature of the tax structure sometimes emerges from these studies in an unexpected way. In Brazil, for example, neither the extent of the differences in estimated tax burden between educational classes in Brazil nor the extent of tax differentials between the rural and urban areas was expected (Sahota, 1968 and 1971).

#### IV. Conclusion

The principal potential role of the tax system in redistributive policy is not to make the poor richer, but the rich poorer. If the objective is a more equal income distribution, the tax system in theory can help achieve it most effectively not by leveling up but by leveling down. Precisely this is the alleged function of most existing wealth taxes, which ought therefore to play a key role in any redistributive fiscal policy even when, as is common, their revenue yield is small (Bird, 1972). Equalization as an end in itself is also a justification for high, even confiscatory, income tax rates--at least in theory--quite apart from any ability-to-pay argument (although the traditionally most widely accepted version of the sacrifice doctrine--the least aggregate sacrifice view of Edgeworth--also leads to the same result). The major function of the tax system with respect to the distribution of income is thus as a possible instrument for lowering the incomes of the well-to-do.

In a sense, then, it is true to say, as has been recently noted, albeit rather cynically, that the tax system is the "supreme equalizer" of economic theory (General Secretariat, p. 7). Furthermore, few will probably disagree with the proposition that taxation in most Latin American countries appears to have done little to correct this initial inequality, both because of its relatively light burden in total in most countries and, more specifically, because of the apparent regressive or proportional nature of its incidence. We too do not disagree with what we take to be the major message of this line of argument--that taxes have done and can do little to correct the distribution of incomes generated by the combination of imperfect markets and myriad interventionist policies which characterizes most Latin American countries. But we think the argument is both too optimistic in assuming we know or can know what the burden of taxes is and, perhaps, though of this we are less certain, too pessimistic in ignoring the potential distributional effect of certain kinds of taxes in reducing the income, wealth, and power of the rich.

A serious problem with the more intensive use of the tax system for redistributive purposes is that, while income in Latin America is so unequally distributed that there are, by anyone's standards a great many poor people, there are only a small number of rich people by relative national standards. This is not a mere play on words. The point is that the average incomes and consumption standards of those at the top of the Latin American pyramid, while much higher than those at the bottom, are in general only roughly equivalent to the average levels prevailing in the developed countries. There are, of course, some very wealthy people in most countries, but it seems nevertheless true that most of the relatively rich in Latin America appear to consider themselves to be middle class, the middle class to be poor, and the poor to be virtually nonexistent. The cosmopolitan perspective from which professionals and other members of this upper-income group tend to view their relative position in the world is at least a partial explanation for the apparently widespread existence of this truncated perception of the national distribution of the good things of life. Combined with the political dominance of the (relatively) well-to-do in Latin America, this fact is perhaps more than sufficient to explain why few efforts, and even less success, to redistribute income and wealth through the fiscal system may be noted in most countries. Those who feel they are middle-class and overtaxed, will not be much moved by studies which categorize them as the lightly taxed rich. Tax burden studies must therefore probably find their justification elsewhere than in their alleged influence on public opinion.

We have also suggested that most such studies are too conceptually and statistically questionable to bear the weight of interpretation that is sometimes put upon them. At most, properly constructed and heavily qualified incidence estimates can be a useful supplement to efforts to appraise and improve tax systems in developing countries:



they can not in themselves provide a road map to the better world, however. Important as the impact of taxation on income distribution may be, economists are not as yet capable of evaluating that impact in quantitative terms with much confidence, and the attempt to do so may, if carelessly presented, be as misleading as it is helpful. Empirical studies of tax incidence and income redistribution will doubtless continue to be made, but we hope that in the future the assumptions will be stated more explicitly and argued more convincingly and the results displayed with more caution and humility, as befits the present state of the art. If so, this critical review of the pioneer efforts of a number of researchers will have served its intended purpose.

Bibliography

- Aaron, Henry, "Estimates of the Distributional Impact of Brazilian Taxes and Expenditures," Council for International Progress in Management (U.S.A.) Inc., July-August, 1968. Mimeographed.
- Aaron, Henry, and Martin McGuire, "Public Goods and Income Redistribution," Econometrica, Vol. XXXVIII (November 1970), pp. 907-20.
- Adler, John, E.R. Schlesinger, and Ernest Olsen, Public Finance and Economic Development in Guatemala, (Stanford University Press, 1952); reprinted by Greenwood Press Publication, Westport, Conn., 1970.
- Andic, Fuat M., Distribution of Family Incomes in Puerto Rico, Caribbean Monograph Series No. 1 (University of Puerto Rico, 1964).
- Andic, Fuat M. and Suphan Andic, Government Finance and Planned Development: Fiscal Surveys of Surinam and the Netherlands Antilles, Caribbean Monograph Series No. 5 (Institute of Caribbean Studies, University of Puerto Rico, 1968).
- Atkinson, A.B., "Capital Taxes, the Redistribution of Wealth and Individual Savings," Review of Economic Studies, Vol. XXXVIII (1971), pp. 209-27.
- Bentzel, Ragnar, "The Social Significance of Income Distribution Statistics," Review of Income and Wealth, Vol. 16 (September 1970), pp. 253-64.
- Bhatia, Mohinder S., Redistribution of Income Through the Fiscal System of Puerto Rico, (Puerto Rico Planning Board, Bureau of Economics and Statistics, 1960).
- Bird, R.M., "A Note on 'Tax Sacrifice' Comparisons," National Tax Journal, Vol. XVII (September 1964), pp. 303-308.
- \_\_\_\_\_, "Equity and Taxes in the Carter Report," Proceedings of Twentieth Tax Conference, Canadian Tax Foundation (Toronto, 1967), pp. 256-64.
- \_\_\_\_\_, "Income Distribution and Tax Policy in Colombia," Economic Development and Cultural Change, Vol. XVIII (1970), pp. 519-35. (1970a)
- \_\_\_\_\_, Taxation and Development (Harvard University Press, 1970). (1970b)
- \_\_\_\_\_, The Growth of Government Spending in Canada, Canadian Tax Foundation (Toronto, 1970). (1970c)
- \_\_\_\_\_, "The Tax Kaleidoscope: Perspectives on Tax Reform in Canada," Canadian Tax Journal, Vol. XVIII (September-October, 1970), pp. 444-78 (1970d)

- Bird, R.M., "Optimal Tax Policy for a Developing Country: The Case of Colombia," Finanzarchiv (N.F.), 29 (February 1970), pp. 30-53. (1970e)
- \_\_\_\_\_, "Tax Policy as a Determinant of Income Distribution: Comments," Third Inter-American Conference on Taxation, Mexico City, September 1972. Mimeographed.
- Bobrowski, L., and S. Goldberg, "Presión Tributaria por Niveles de Ingreso: Un Analisis Comparativo," Finanzas Públicas, Segundas Jornadas 1969 (Córdoba, Argentina, 1970), pp. 392-445.
- Bracewell-Milnes, Barry, The Measurement of Fiscal Policy (Confederation of British Industry London, 1971).
- Brady, E.A., The Distribution of Total Personal Income in Peru (Department of Economics, Iowa State University, 1968).
- Buchanan, James M., Cost and Choice (Markham, Chicago, 1969).
- \_\_\_\_\_, Public Finance in Democratic Process (University of North Carolina Press, 1967).
- Cline, William R., Potential Effects of Income Redistribution on Economic Growth: Latin American Cases (Praeger, New York, 1972).
- Consejo Federal de Inversiones, Política Fiscal en la Argentina, (Buenos Aires: Edición del CFI, 1963).
- Cragg, John G., Arnold C. Harberger, and Peter Mieszkowski, "Empirical Evidence of the Incidence of the Corporate Income Tax," Journal of Political Economy, Vol. LXXV (Dec. 1967), pp. 811-21.
- De Wulf, Luc, "Fiscal Incidence Studies in Developing Countries: Survey and Critique," forthcoming.
- de Jouvenal, Bertrand, The Ethics of Redistribution (Cambridge, 1951).
- Dich, Jørgen S., "On the Possibility of Measuring the Distribution of Personal Income," Review of Income and Wealth, Vol. XVI (September 1970), pp. 265-72.
- Dosser, Douglas, "Tax Incidence and Growth," Economic Journal, Vol. LXXI (September 1961), pp. 572-91.
- Due, John, Indirect Taxation in Developing Countries (The Johns Hopkins Press, 1970).
- Fishlow, Albert, "Brazilian Size Distribution of Income," American Economic Review, Papers and Proceedings, Vol. LXII (May 1972), pp. 391-402.

- Forget, Claude, International Tax Comparisons, "Studies of the Royal Commission on Taxation, No. 14" (Queen's Printer, Ottawa, 1966).
- Friedman, Milton, A Theory of the Consumption Function (Princeton University Press, 1957).
- Gandhi, Ved, "Incidence of Corporation Tax," Artha Vijnana, Vol. X (March 1968), pp. 11-28.
- \_\_\_\_\_, "Indirect Taxes and Personal Income Distribution," Unpublished draft paper, April 1972.
- \_\_\_\_\_, Tax Burden on Indian Agriculture (Harvard Law School, 1966).
- General Secretariat, Organization of American States, "Tax Policy for Income Redistribution," Third Inter-American Conference on Taxation, Mexico City, September 1972. Mimeographed.
- Gillis, S.M., "Sales Taxation in a Developing Economy: The Chilean Case" (Ph.D. dissertation, University of Illinois, 1968).
- Goode, Richard, "The Income Tax and the Supply of Labor," Journal of Political Economy, Vol. LVII (October 1949), pp. 428-37.
- Hainsworth, G.B., "The Lorenz Curve as a General Tool of Economic Analysis," Economic Record, Vol. XL (1964), pp. 426-41.
- Herschel, Federico Julio, Comment on "Estimating the Distribution of the Tax Burden," in Problems of Tax Administration in Latin America by R.A. Musgrave (The Johns Hopkins Press, 1965), pp. 76-90.
- Hunt, Shane, "Distribution, Growth and Government Economic Behavior in Peru," Government and Economic Development, Gustav Ranis (ed.), (Yale University Press, 1971), pp. 374-416.
- Kaldor, Nicolas, "Economic Problems of Chile, 1956," Essays on Economic Policy, 2 vols. (London, Gerald Duckworth & Co., 1964), pp. 233-87.
- Kondor, Yaakov, "An Old-New Measure of Income Inequality," Econometrica, Vol. XXXIX (November 1971), pp. 1041-42.
- Kristol, Irving, "Of Populism and Taxes," The Public Interest (Summer 1972), pp. 3-11.
- Krzyzaniak, Marian, and Richard Musgrave, The Shifting of the Corporation Income Tax (The Johns Hopkins Press, 1963).
- Kuznets, Simon, "Quantitative Aspects of the Economic Growth of Nations: VIII, Distribution of Income by Size," Economic Development and Cultural Change, Vol. XI (January 1963), pp. 1-29.
- Lall, V.D., "Shifting of Tax by Companies," The Economic and Political Weekly, Vol. XI (May 1967), pp. 839-49.

- Lampman, Robert J., "Recent Thought on Egalitarianism," Quarterly Journal of Economics, Vol. LXXI (May 1957), pp. 234-66.
- Laumas, Gurcharan S., "The Shifting of the Corporate Income Tax: A Study with Reference to Indian Corporations," Public Finance, Vol. XXI (1966), pp. 462-73.
- Levin, Jonathan, "The Effects of Economic Development on the Base of a Sales Tax: A Case Study of Colombia," Staff Papers, Vol. XV (1968), pp. 30-101.
- Lovejoy, R.M., "The Burden of Jamaican Taxation (1958)," Social and Economic Studies, Vol. XII (1963), pp. 442-58.
- Maital, Shlomo, "Public Goods and Income Distribution: Some Further Results" Unpublished paper, 1972.
- Manrique, Rodrigo, "The Incidence of Public Expenditures in Colombia," (Master's thesis, Vanderbilt University, 1972).
- McLure, Charles, "The Distribution of Income and Tax Incidence in Panama, 1969," (U.S. Agency for International Development, Washington, 1971). Mimeographed. (1971a)
- \_\_\_\_\_, "The Incidence of Taxation in Colombia," Fiscal Reform for Colombia, Malcolm Gillis, ed., (Harvard University, 1971), pp. 239-66. (1971b)
- Meerman, Jacob, "The Treatment of Fiscal Incidence in Empirical Studies in Income Distribution in Poor Countries," (U.S. Agency for International Development, Washington, June 1972). Mimeographed.
- Morag, Amotz, On Taxes and Inflation (Random House, New York, 1965).
- Morgan, J.G., "The Anatomy of Income Distribution," Review of Economics and Statistics, Vol. XLIV (August 1962), pp. 270-83.
- Musgrave, Richard A., "Estimating the Distribution of the Tax Burden," Problems of Tax Administration in Latin America (The Johns Hopkins Press, 1965), pp. 31-75.
- Musgrave, Richard A., J.J. Carroll, L.D. Cook, and L. Frane, "Distribution of Tax Payments by Income Groups: A Case Study for 1948," National Tax Journal, Vol. IV (March 1951), pp. 1-53.
- Nicholson, J.L., "Redistribution of Income--Notes on Some Problems and Puzzles," Review of Income and Wealth, Vol. XVI (September 1970), pp. 273-78.
- Oldman, Oliver, and Daniel Holland, "Measuring Tax Evasion" (Harvard Law School and the Sloan School of Management, 1971). Mimeographed.

- Polinsky, A. Mitchell, "A Note on the Measurement of Incidence," (Urban Institute Working Paper 1200-15, Washington, January 1972). Mimeographed.
- Prest, Alan R., "Statistical Calculations of Tax Burdens," Economica, Vol. XXII (August 1955), pp. 234-45.
- \_\_\_\_\_, "The Budget and Interpersonal Distribution," The Budget and the Distribution of National Income (Institut International de Finances Publiques, York, 1968), pp. 80-98.
- Programa Conjunto de Tributación, Estudio sobre Política Fiscal en Argentina (versión preliminar), 7 vols. (Consejo Nacional de Desarrollo, Buenos Aires, 1967).
- Rao, V. Ganapathi, and K.S. Hanumantha Rao, "The Incidence of the Corporate Income Tax in the Short-run: The Case of Indian Corporations," Public Finance, Vol. XXVI (1971), pp. 586-606.
- Ghulam, Mohammed Radhu, "The Relation of Indirect Tax Changes to Price Changes in Pakistan," Pakistan Development Review, Vol. V (Spring 1965), pp. 54-61.
- Rawls, John, The Theory of Justice (Harvard University Press, 1971).
- Recktenwald, Horst-Claus, Tax Incidence and Income Redistribution (Wayne State University Press, Detroit, 1971).
- Roskamp, K.W., "The Distribution of Tax Burden in a Rapidly Growing Economy: West Germany in 1950," National Tax Journal, Vol. XVI (March 1963), pp. 20-35.
- Ruggles, Richard, "Income Distribution Theory," Review of Income and Wealth, Vol. XVI (September 1970), pp. 211-19.
- Sahota, Gian, "The Distribution of Tax Burden in Brazil" (Sao Paulo, June 1968). Mimeographed.
- \_\_\_\_\_, "The Distribution of the Tax Burden among Different Education Classes in Brazil," Economic Development and Cultural Change, Vol. XIX (April 1971), pp. 438-60.
- \_\_\_\_\_, "Public Expenditures and Income Distribution in Panama," (U.S. Agency for International Development, Panama City, August 1972). Mimeographed.
- Schultze, Charles L., Fred Edward, Alice Rivlin, and Nancy H. Teeters, Setting National Priorities: The 1973 Budget. (The Brookings Institution, Washington, 1972).

- Schydrowsky, David M., Comments on "Distribution, Growth and Government Behavior in Peru," in Government and Economic Development, Gustav Ranis ed. (Yale University Press, 1971), pp. 416-28.
- Shoup, Carl S., Public Finance (Aldine, Chicago, 1969).
- Shoup, Carl S., Roy Blough and Mabel Newcomer, Studies in Current Tax Problems (Twentieth Century Fund, New York, 1939).
- Shoup, Carl S., et al., The Fiscal System of Venezuela: A Report (The Johns Hopkins Press, 1959).
- Simons, Henry, Personal Income Taxation (University of Chicago Press, 1938).
- Smith, R. Stafford, Local Income Taxes: Economic Effects and Equity (Institute of Governmental Studies, University of California, Berkeley, 1972).
- Tanzi, Vito, "International Tax Burdens," Taxation: A Radical Approach (Institute of Economic Affairs, London, 1970), pp. 1-49.
- Taylor, Milton, et al., Fiscal Survey of Colombia (The Johns Hopkins Press, 1965).
- United Kingdom, Report of the Committee on National Debt and Taxation (Colwyn Report) (1927).
- United Nations, Economic Commission for Latin America, Income Distribution in Latin America (New York, 1971).
- Urrutia, Miguel M., and Clara E. de Sandoval, "Política Fiscal y Distribución del Ingreso en Colombia," Revista del Banco de la República (July 1971).
- Wallich, Henry, and John Adler, Public Finance in a Developing Country: El Salvador--A Case Study (Harvard University Press, 1951).
- Webb, Richard C., "Tax Policy and the Incidence of Taxation in Peru," Discussion Paper No. 27, Research Program in Economic Development, Woodrow Wilson School (Princeton University, September 1972). Mimeographed. (1972a)
- \_\_\_\_\_, "The Distribution of Income in Peru," Discussion Paper No. 26, Research Program in Economic Development, Woodrow Wilson School (Princeton University, September 1972). Mimeographed. (1972b)
- Weisskoff, Richard, "Income Distribution and Economic Growth in Puerto Rico, Argentina, and Mexico," Review of Income and Wealth, Vol. XVI (December 1970), pp. 303-32.