VAT, INCOME DISTRIBUTION, AND TAX INCIDENCE

By

Charles E. McLure, Jr.
Stanford University

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ABSTRACT

The paper describes the problems encountered in appraising the incidence of a tax, in particular, that of the VAT. The futility of attempting to evaluate the incidence of entire tax systems is outlined: limitations on data and severe conceptual and methodological problems render the answers obtained quite unreliable. The results of studies of tax incidence that express tax burdens as effective tax rates can be no better than the incidence assumptions and data underlying them. This paper was prepared for the Conference on Value Added Taxation in Developing Countries, sponsored by the Public Economics Division, Development Research Department, The World Bank.
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VAT, INCOME DISTRIBUTION, AND TAX INCIDENCE

I. Introduction

Policymakers considering the adoption of a value added tax (VAT)—or any other tax—generally, and quite appropriately, are interested in the distributional implications of the tax, whether it is to be a new source of additional revenue or a replacement for revenues from another source. This interest is generally captured in the question "who pays the tax?" There is naturally a desire to want to place the answer to this question in the context of knowledge about the incidence of the existing tax system and to know how the distribution of tax burdens compares with the incidence of the benefits of government spending.

Incidence studies can usefully be characterized as the "quantification of incidence assumptions." That is, economic theory provides "best guesses" as to the incidence of various taxes among such broad groups as consumers, workers, and owners of capital, or burdens on such finely delineated groups as consumers of tobacco products, workers in a given industry, corporate shareholders, etc. These group burdens are then attributed to income classes on the basis of the best available information on the distribution of the economic activity bearing the tax (consumption, labor income, capital income, cigarette smoking, or whatever) among the income classes. The tax burdens are ordinarily expressed as effective tax rates,

* The author wishes to thank Wayne Thirsk for helpful comments on an earlier draft of this paper.
that is, as percentages of income in each income class, so that a judgment can be made about the progressivity of the various taxes. ¹

Clearly the results of such studies of tax incidence can be no better than the incidence assumptions and data underlying them. In some cases, for example, an excise tax on tobacco products or even a broad-based value added tax, tax incidence may be relatively straight-forward: smokers and consumers, respectively, probably pay these two taxes. ² But in other cases, including the corporation income tax and the property tax, the answer is far less clear. Theory may give conflicting answers, even for thoughtful analysts, and empirical evidence is woefully deficient and ambiguous. Even worse, "standard" incidence assumptions are often uncritically applied in situations in which they are not appropriate. Finally, the data required for a careful analysis of tax incidence often do not exist, especially in developing countries. Thus results for effective tax rates reported to the second decimal place exhibit "misplaced concreteness." Analysts are lucky if they know the last digit before the decimal with any confidence, and should not pretend otherwise. Unfortunately, few admit the weaknesses of their analyses (even if they recognize them), and the reader is often left to his or her own devices in discovering what has been done that may not be legitimate. ²

The situation is even worse if one turns to the expenditure side of the budget, where theory and methodology are less developed. Too little attention is paid to the basic distinction between benefit incidence (who gets the benefits of public services) and expenditure incidence (how private income is changed by public expenditures). ³ This confusion is compounded by the fact that in some cases, particularly in developing countries, ostensibly
exhaustive expenditures (purchases of goods and services) are really thinly disguised transfers that have little real benefits except to those who receive the payments from the fisc.

This paper elaborates further on a few of the difficulties of tax incidence studies. Section II provides a comparison of partial and general equilibrium incidence analysis. Section III describes difficulties of studies of tax incidence. Problems that arise in appraising the incidence of a value added tax are described in section IV. No attempt is made to discuss the corresponding difficulties of performing and interpreting studies of benefit and expenditure incidence.

II. Partial vs. General Equilibrium Analysis

The objective of most studies of tax incidence is to determine "who pays the tax." It is not to determine in a more comprehensive manner the overall effects of taxation on the distribution of income or of welfare. As a general rule, incidence studies do not report benefits, as well as burdens of taxation, except when the differential incidence of taxes (the difference in the burden of two taxes) is being examined. Yet some taxes can create important benefits, and taxation can alter the distribution of income or well-being in ways that are captured quite inadequately by standard (especially partial equilibrium) incidence analysis.

Consider a protective tariff that chokes off virtually all imports of a product, thereby encouraging import substitution that allows monopoly profits to be earned by domestic producers. Standard incidence analysis would
report only that the import duties are borne by consumers of the imported product. It would fail to report that a quasi-tax is borne by consumers of the domestically produced import substitute, who pay a price that is above the world price because of the protective tariff. Nor would it record the corresponding transfer of real income to the local producer earning monopoly profits. These unreported effects may be vastly more important than the tax burdens that are reported by standard incidence analysis. In the extreme case of complete protection, there would be no revenues to allocate to consumers, but the transfers from consumers to producers created by protection could be quite significant.

Consider next the incidence of the corporation income tax, ignoring for now both the important implications of international capital mobility and the foreign tax credits granted by some capital exporting countries. (These are discussed in section IIIC below.) The closed economy general equilibrium analysis pioneered by Harberger (1962) indicates that the corporate income tax is likely to (a) reduce the incomes of owners of all capital by roughly the amount of the tax and (b) cause the prices of products of the corporate sector to rise relative to those of the non-corporate sector. Incidence studies often present estimates of burden distribution based on the "Harberger" assumption that the tax is borne by all owners of capital, as well as alternative estimates based on the more traditional views that it is borne by shareholders or is shifted to consumers or to workers. But they hardly ever mention that those who consume disproportionate amounts of corporate products experience an additional burden on the uses side of income, whereas those who prefer products of the non-corporate sector benefit from the shift in relative
product prices. This oversight may be relatively unimportant, especially in developed countries, where the corporate/non-corporate composition of consumption may not differ significantly across income classes. But in developing countries--especially the poorest ones--this may be an important omission, since consumption of products of the corporate sector would appear to be significantly more important for high-income groups.

Economists have long recognized that taxes generally impose burdens on consumers and producers that exceed the amount of revenues obtained by the government. The so-called excess burdens of taxation reflect the loss of welfare that results from tax-induced distortions of economic decisions. Traditional incidence studies never attempt to take account of these excess burdens, even though they may often be quite large relative to tax revenues (or even exceed them).

To some extent the problems just described result from the mindset created by the way the incidence question is commonly asked. Concentration on "who pays the tax" does not naturally lead one also to ask who benefits from taxes and whose income is reduced as a result. Nor, as noted, does it take account of excess burdens of taxation.

A different methodology--applied (or computable) general equilibrium analysis--creates a different mindset and leads to a conceptually more satisfactory analysis of the distributional effects of tax policy. In it an attempt is made to specify production and consumption decisions (and financial decisions in some models) and interactions in the economy in a way that assures methodological consistency and allows general equilibrium effects on
economic welfare to be captured. Such analysis inherently incorporates all effects on the distribution of income and economic welfare. Excess burdens of taxes are automatically captured in this type of analysis.

Despite these advantages, general equilibrium analysis is not without problems, some of which it shares with traditional incidence studies (e.g., problems of data and issues of which taxes to analyze). A complete description of such problems is beyond the scope of the present paper, but a few can be noted. First, it is often difficult to describe complicated features of tax law in a "model specific" way that allows their incorporation into a computable general equilibrium model. For example, an attempt to model integration of the corporate and personal income taxes may fail to capture important institutional realities. This problem is discussed further in the context of the VAT in section IV below.

Second, the incidence of taxes revealed by the model is dictated by the theoretical structure of the model and the values of key parameters. This may appear to be an attraction, since it reduces the latitude of the analyst in choosing incidence assumptions. But it can be a trap based on illusion; after all, someone must choose the theoretical structure, and judgements must be made about the values of key parameters in the model. At least in traditional analyses of tax incidence it is less likely that unconscious decisions are made about incidence assumptions or that they are hidden deep in the bowels of a complicated system of equations.
III. Problems of Incidence Studies

Incidence studies commonly report effective tax rates at various points in the income distribution, since the distribution of tax burdens (their relation to income) across income classes is generally thought to be more relevant for policy analysis than the functional distribution emphasized by classical economists. In the more ambitious studies, separate incidence patterns for the urban and rural (or agricultural and nonagricultural) sectors are also calculated. In this section, we examine some of the difficulties that can be encountered in implementing (and utilizing results from) incidence studies. 10

A. Data

The distribution of income among households or families seems more relevant than that among individuals for appraising income distribution and tax equity. Thus income distribution and incidence studies commonly employ information on the distribution of family (or household) income and consumption patterns taken from household budget surveys, where such surveys are available. But investigators are sometimes limited by the lack of data to using a distribution of income for the economically active population. Sometimes, even this is not available, and it is necessary to build up an estimate of the income distribution from fragmentary information taken from such diverse sources as employment surveys, income tax records, and surveys of agriculture, commerce, industry, transportation, etc. Involving as it does the piecing together of data originally collected for other and usually different purposes, covering different years, and employing different income
concepts, such estimates are inherently subject to considerable uncertainty. They may include the unemployed only with difficulty, and it is difficult to consolidate recipients of income and others into families or households, in any event. Moreover, the absence of a suitable household budget survey poses severe problems when one turns to the attribution of indirect taxes to various income classes on the basis of consumption of the taxed items.

Even if a fairly recent household budget survey is available, troubles may still be encountered. Some such surveys are intended primarily to reveal the consumption patterns of urban workers needed for the calculation of a consumer price index, rather than the distribution of income. Results from such a survey can perhaps be employed to attribute indirect taxes to income classes and to calculate effective tax rates, but they can be used as the foundation for an estimate of the distribution of income only with considerable trepidation.11

At least two other problems face the incidence analyst. First, "income" in the sample is almost certainly not what economists mean by income. Most obviously, it might be money income, and exclude income in kind such as the services of owner-occupied housing, consumption by subsistence farmers, etc. Omitting certain forms of income in kind overstates the inequality of income and any tendency for taxes to be regressive. Beyond that (and producing an opposite bias), it may exclude valuable perquisites and fringe benefits supplied by employers, such as housing, meals, automobiles, cash allowances of various types, etc.12 Finally, the treatment of such items as withheld income and payroll taxes and unrequired transfers from abroad is often far from obvious.
A further difficulty arises from the inherent difficulty of measuring capital and business income, especially in an inflationary environment. First are important issues of timing of the recognition of income and expenses. How, for example, has the respondent treated the increase in value of growing timber and the related expenses of silviculture? Related issues arise in other instances of multi-period production. Second, has adjustment been made for inflation in calculating income? For example, has the loss in real value of unindexed bonds and other obligations fixed in nominal value been recognized? Are depreciation allowances adjusted for inflation? Since it is difficult for trained specialists to construct proper measures of income in cases such as these, there is no reason to expect survey respondents to treat them correctly.

Many public finance economists would attempt to approximate the Haig-Simons definition of income -- consumption plus change in net wealth -- in the classifier and in the denominator used in calculating effective tax rates in incidence studies. The most important step, inclusion of unrealized capital gains, is almost impossible to take, and even reliable data on realized capital gains may be difficult to obtain. But an important source of unrealized gains, retained earnings of locally owned corporations, can generally be attributed to shareholders. Once this step is taken, however, there is little reason not to include the corporation income tax in the before-tax income figure for shareholders, if (or to the extent that) it is thought that the tax is not shifted. After all, the income (dividends or retained earnings) of shareholders could be higher in the absence of such a tax. Much the same can be said of export taxes that reduce the incomes of
those in the export sector. But not all analysts will agree on the incidence of these various taxes; this issue is discussed further below.

Another problem involves the time span over which income is measured. A reliable picture of income distribution and tax incidence cannot be gained from a survey covering a short period. The problem is not eliminated even if a full year is covered by the survey, though it is greatly reduced. Not only do transitory elements such as unemployment distort any estimate of income distribution; to the extent that consumption patterns are determined more by permanent (or life cycle) income than by current income, the regressivity of indirect taxes will be overstated if families are classified according to income. Classifying families by total consumption, rather than by current income, might help to alleviate this problem, but the data necessary to do so are generally not available -- or are available only from special tabulations.

In most developing countries data on income distribution and consumption patterns are readily available only for the population as a whole or for major sectors (e.g., urban and rural) of the economy. Only rarely are such data available for particular age cohorts. Yet a society composed entirely of families with identical life-cycle incomes who happened to be at different points in the life cycle would not have a rectangular distribution of income. Rather, the old and the young would be counted as relatively poor and those in their middle years as relatively well-off. While this kind of inequality of income across age-cohorts might be disturbing, it should have nowhere near the same consequences for public policy as inequality within age cohorts.
A related problem with the income-distribution approach is inherent in concentration on the calculation of effective tax rates at various income levels. A given income class will contain smokers and non-smokers, teetotalers and drinkers, workers and capitalists, farmers and urban families, etc. As a result, the effective tax rate for the income class as a whole can mask large differences in the effective rates of tax paid by various families within the income class, that is, horizontal inequities. The problem is not as bad if urban and rural sectors are considered separately, as is often the case. But even if this is done, horizontal differences within sectors can be considerable. It may be of little comfort to the heavily taxed Colombian coffee farmer or the Malaysian smallholder who raises rubber, for example, to know that on the average the rural family with his income is relatively lightly taxed.

Diverse items may fall into the same category in a consumer budget survey. Heavily taxed Scotch whiskey and French champagne consumed primarily by the affluent; locally produced rum, gin, vodka, piscos, and aguardientes; popularly consumed local beers; and untaxed non-commercial drinks may all fall under the heading of "alcoholic beverages," in a consumer survey. Without a finer breakdown of consumption, the taxes collected on these items may be allocated among households in a way that is quite incorrect and misleading, even if respondents report their consumption accurately (which for alcoholic beverages may be far from certain).

Many of the problems described above can be alleviated, though at some cost, by calculating the taxes paid by a representative household at a given income level. Under this "typical household" approach allowance can be
made for the age of the head of the household, for particular aspects of consumption, and for various sources of income. In this way age-specific tendencies in effective tax rates and horizontal inequities can be isolated and emphasized. Moreover, since consumption would presumably be related to permanent income, distortions created by transitory charges in income would not appear.

Despite the clear advantages of the typical household approach for some purposes, there are equally clear disadvantages. First, one must know something about the underlying distribution of income if one is to define the typical household. Beyond that, one must know the consumption pattern of the typical family (or families), including especially the relationship between consumption and permanent income. But if one has this much information it might be possible to overcome most problems of the traditional approach.

B. The Taxes Included

The object of incidence studies might reasonably be taken to be the determination of who pays for providing general governmental services. This view has important implications for the choice of taxes and other sources of government revenues to include in -- and to exclude from -- incidence studies.

First, taxes that are related closely to benefits received from government services should be excluded from the analysis, or at least segregated from other receipts and their incidence reported separately. A simple but extreme hypothetical example should clarify this. Suppose that the government supplies the optimal quantity of a service that has no external
benefits and is produced under conditions of constant costs, charging consumers just enough to cover costs of production. By assumption people would get just what they pay for, and the incidence of the fees charged would be of little interest, whether they took a greater or smaller share of income at the top of the income scale than at the bottom. While this example is admittedly extreme and artificial, its lesson is none the less important: benefit taxes should not be included in incidence analysis. Thus in many countries there is a valid reason to exclude social security taxes (where benefits are closely related to taxes), some export taxes (where revenues are plowed back into the export sector), and perhaps part of motor fuel and other automotive taxes from incidence analysis. In principle, any of these -- and others -- should be included only to the extent that revenues exceed costs of providing identifiable benefits. Conversely, to the extent that revenues fail to cover marginal costs of public services with identifiable beneficiaries, a subsidy exists and should be recognized in incidence analysis. 17/

Second, there is no reason to limit analysis to sources of revenue that are designated as taxes, either officially or by common practice. Profits of liquor monopolies and lotteries should be (and usually are) included in incidence analysis. But so should the excess (or deficiency) of charges of governmentally owned public utilities over marginal costs. By focusing upon those revenues traditionally labelled as taxes, to the general neglect of tax and subsidy elements in public utility prices, incidence analysts overlook a potentially important source of income redistribution through the fisc.
Finally, it is common to employ a differential foreign exchange rate for important exports (with the central bank or the government appropriating the differential), rather than explicitly levying a tax on export earnings. Official earnings from such differentials are generally similar to taxes and should be treated as such in incidence studies. 18/

C. Incidence Assumptions

For many taxes the assumptions made about incidence are more or less conventional and non-controversial. Such is the case especially for indirect taxes, which ordinarily can reasonably be attributed to consumers. 19/ But for other taxes the proper incidence assumptions are more controversial and deserve brief discussion.

Perhaps the incidence of no tax is more controversial than that of the corporation income tax. Fortunately, the area of controversy is greatly reduced by the existence of foreign tax credits in some important capital-exporting countries. To the extent that such credits are available, the developing host country simply appropriates revenues that would otherwise flow to the treasury of the home country of the multi-national and tax is exported.

Theoretical arguments and empirical evidence for developed countries can be marshalled to support tax burdens on shareholders, diffusion to owners of all capital, and shifting to either consumers or labor. 20/ Appraisal of incidence in developing countries may have to be based largely on theoretical arguments, for several reasons. First, empirical estimates of shifting in developing countries are virtually non-existent. Second, the empirical literature from developed countries is far from conclusive, and it would be of
limited relevance in developing countries, even if it resolved the issue for advanced countries.

A theoretical argument that is particularly compelling rests on the international mobility of capital. If the developing country's corporate tax is below the tax creditable in the home country of multinational firms, the gross return earned by these firms effectively acts as a ceiling on gross returns in the domestic market. Thus the tax on domestic corporations is likely to be borne by local capitalists to the extent that it does not exceed the rate creditable in home countries of multinational corporations. Once that key tax rate paid by multinational firms is exceeded, the argument changes drastically. In this case it can be argued that investment will be made in a developing country only if the corporation income tax can be shifted, say to consumers and labor. But international capital mobility may not be great enough to guarantee this result. Moreover, potential economic rents and the desire to penetrate a market before it is preempted by competitors may induce firms to invest despite the corporate tax; in such a case shifting would not occur. Thus the conscientious incidence analyst may have little alternative but to present alternative estimates for two or more incidence assumptions. This uncertainty is particularly unfortunate, since in many countries the degree of progressivity in the overall tax system depends crucially upon how the corporation income tax is allocated among income classes.

During the 1970s a "new view" that the incidence of the property tax on improvements falls on owners of capital has come to replace the more traditional view that such a tax is borne by consumers. But reasoning
similar to that in the previous paragraph suggests that the tax on improvements may be borne primarily by consumers, and perhaps by workers and landowners, after all. Since in most developing countries the property tax is a relatively minor source of revenue, the uncertainty over its incidence is less disconcerting than that about the incidence of the corporation income tax.

Export duties are generally borne by those factors employed in production for export, except under very special circumstances. Yet some incautious analysts simply assume that such taxes can be shifted to foreign consumers like indirect taxes on local consumption.

D. The Possibility of Comparisons

Given the difficulties just described, comparisons of tax incidence in different countries, and even in the same country at different times, are hazardous. Two issues deserve special attention. The choices of taxes to include and incidence assumptions to use must be based on the economic realities prevailing in the country in question. That is, in one country social security benefits may be closely linked to contributions, whereas in another the link between taxes and benefits is so tenuous that these taxes should be included in the analysis. Similar comments apply in such areas as public utility pricing and the relation between automotive taxation and highway finance.

Similarly, the incidence analyst cannot simply go from country to country with a standard cookbook of incidence recipes, one for each tax. Because the appropriate incidence assumption depends on conditions in a given
country, the analysis of tax incidence must, to alter the culinary analogy, be done "from scratch," instead of being "ready-mix." That is, the incidence of the corporation income tax is likely to depend upon the degree of production by state-owned enterprises, the extent of participation by multinational corporations in the corporate sector, the availability of foreign tax credits or tax sparing in the home countries of multinationals operating in the country, the mobility of capital in and out of (and perhaps within) the economy, the composition of corporate output, the structure of industry in the country, etc. -- things that can be known only through detailed analysis.25

Similar comments can be made about the treatment of other taxes.26

E. Concentrating on Tax Changes

A somewhat different final point relates to the purpose, legitimacy, and usefulness of tax incidence studies. There is an almost irresistible tendency to want to know the incidence of all existing taxes, so that we can know whether the system is progressive or regressive and how it compares with the distributional effects of expenditures. After all, a regressive levy may be more palatable if it is part of a system that is progressive overall. But the theoretical legitimacy of employing partial-equilibrium analysis in "thinking away" the entire tax system is questionable; eliminating all taxes might have repercussions that are captured only quite imperfectly by standard incidence analysis.27 Moreover, the usefulness of knowledge of the incidence of the entire tax system is also doubtful; after all, virtually no one seriously (and hardly ever successfully) suggests either abolishing the present tax system or doubling it. Rather, they may propose marginal additions or changes in present taxes. The analysis of such marginal changes is, of course, not subject to the methodological flaw just mentioned.
Future research should be devoted more to examining the incidence of politically feasible changes in existing taxes. In such studies attention could be paid to details that are inevitably passed over in general incidence studies, which tend to be done with a broad brush. Care could be taken, for example, in assessing the likelihood that an export tax might be partially shifted, the extent to which a higher corporation income tax might not repel capital because of unused foreign tax credits, economic returns or quasi-rents, or international immobility of capital, the possibility that urban property taxes might not burden the poor because of either legal or de facto exemptions, etc. Especially important in the present context, it could reveal the distributional effects of differential rates, zero rating, and exemptions under the VAT. (See also the next section.) Such studies would tend to lead directly to policy implications, as well as being interesting in their own right.28

IV. Incidence of the VAT

The incidence of the value added tax (VAT) can be examined on several levels, depending on the exact type of tax involved and the availability of data. The simplest approach is simply to allocate the tax among income brackets on the basis of total consumption expenditures or total expenditures on non-food consumption, depending on whether or not food is taxed. Such an approach is likely to be satisfactory only if coverage is more or less universal, only one rate is applied to taxed consumption, and if food is excluded, it is via zero rating, rather than exemption. Of course, these conditions are rarely encountered, and a more sophisticated analysis would
ideally take account of both differential rates and exemptions from the tax base.

Unfortunately, it is no easy task to meet this mandate. Though I cannot be exhaustive in describing problems likely to be encountered, I can be suggestive. In doing so I will concentrate on problems of methodology, playing down data problems.

In order to allocate to various income classes the value added tax included in the prices of products bought by households in the income class, it is generally necessary to know how much VAT has been borne at pre-retail stages, as well as at the retail stage. Concentrating on the net tax paid at the retail stage (i.e., tax liability after credit for tax paid at prior stages) is almost never satisfactory. Focus on gross tax liability at the retail stage (i.e., tax liability before credits) is satisfactory only under the very special circumstances that: a) the retail stage is subject to VAT, b) retail sales are made only to households, and c) all prior stages of production have been taxed (even if at a zero rate), with no breaks in the chain of credits. Under this textbook specification only the tax rate levied on retail sales actually matters, since all VAT collected at prior stages is exactly offset by credits at the retail stage. Posing the problem in this way indicates two important sources of problems. First, retail sales are not necessarily sales of final products to consumers, except in selected industries. More generally, retail sales include sales to business, for which an adjustment must be made in calculating gross liability on sales to consumers.
Second, and more important, the other two requirements listed above -- coverage of all sales to households and no break in the chain of credits -- are unlikely to be experienced in practice. A few examples will indicate the importance of this qualification. Retail sales of certain goods and services may be exempt from VAT; housing, financial services, education, and medical services are common examples. Exemption of the retail stage does not, however, necessarily mean that no tax is embodied in the price of such goods and services. Unlike zero-rating, exemption does not provide for the recoupment of taxes paid before the retail level. A thorough analysis would attempt to allocate pre-retail taxes to consumers of these exempt products.

A break in the chain of credits will also imply that total taxes embodied in the price of a given product subject to tax will exceed the gross liability at the retail stage. This can happen, for example, in the case of exempt financial and insurance services provided to businesses, exemptions for farmers and small business, and commercial and industrial real estate (if construction and sale of buildings are taxed, but rentals are exempt). In most cases results will probably not be greatly distorted if the excess taxes that result from breaks in the chain of credits are simply allocated on the basis of some broad measure of consumption such as total consumption or non-food consumption. But in other cases, such as exemptions for small business and farmers, forward shifting to consumers would appear to be unlikely, and an assumption of burden on the exempt group would appear to be more reasonable. Quantifying these excess taxes may generally be quite difficult in the absence of a general equilibrium methodology of the type described below.
No partial equilibrium analysis that only focuses on sales to ultimate consumers, with ad hoc adjustments for taxes paid at prior stages is likely to be truly satisfactory in capturing the effects just described. Clearly what is required is the use of a general equilibrium framework that allows for input-output relationships. With such a framework explicit account can be taken of taxes paid at pre-retail as well as retail stages of production and distribution. Such an analysis would ideally reflect the mechanics of the credit method of collecting the VAT: gross liabilities would be calculated by applying the appropriate tax rate to sales, and credit would be allowed for taxes paid on inputs by registered sectors (those not making exempt sales); in the case of exempt sectors, no credit would be allowed for tax paid on inputs. In all cases, net liabilities at all stages of production would be aggregated via input-output relationships.

I am unaware of any study that actually follows this methodology. The ambitious study by Ballard, Scholz, and Shoven (1986) examined the effects of both a flat rate VAT and a VAT with differential rates, but does so in a way that neglects important aspects of the problem just described. For example, in the differential rate analysis it assigns financial services, other services, and housing a zero tax rate, thus ignoring all taxes collected at prior stages. Nor is there any allowance for breaks in the chain of credits in the production and distribution of other goods and services under either the flat rate or differential rate analysis. The approach used by Ballard, Scholz, and Shoven is thus perhaps best characterized as an analysis of a tax levied at differential rates on sales to ultimate consumers; it is not truly an analysis of a value added tax as one actually works.
FOOTNOTES


2. But even here, see the contrary view expressed by Browning (1978 and 1985) that where transfers are important such taxes are borne by owners of productive factors, rather than by consumers.

3. For more on this distinction, see Musgrave (1959, chap. 10) and McLure (1971) and (1974).

4. For more complete and more technical discussions, see Bird and Dewulf (1971) and (1974).

5. But see McLure (1974) and Dewulf (1975).

6. Devarajan, Fullerton, and Musgrave (1980) indicate that partial equilibrium analysis actually does fairly well in indicating the general equilibrium incidence of taxation in many cases.

7. See, however, the excellent summary by Shoven and Whalley (1984) and the articles in Scarf and Shoven (1984).

8. Shoven and Whalley (1984, p. 1045) warn "Model preselection can thus powerfully affect the conclusions that are reached."


10. The problems described here are not encountered in all countries. But my own personal experience in a half-dozen countries -- including some recent experience -- suggests that even in the mid-1980s problems of the type described are likely to be encountered in many countries.

11. For this reason estimates of effective tax rates are probably more reliable than the estimates of income distribution.

12. Whether benefits of public services should be included in income or should only be the subject of expenditure analysis is controversial.

13. Social security and other data on earnings could be employed to reveal the distribution of earnings among and within age cohorts. Household surveys generally cannot be tabulated to provide similar information on age-specific non-labor income and consumption patterns because the samples are not large enough for such tabulations to be statistically meaningful.

14. An interesting methodological issue in developed countries, if not in developing ones, is how to treat contributions to pension funds, earnings of such funds, and retirement pensions. A cash-based definition of income would report income only upon the receipt of the pension, but an
accrual based system would report it as contributions are made and as earnings on funds accrue. See U. S. Department of the Treasury (1984), vol. 1, pp. 57-61.

15. For a persuasive plea for more attention to horizontal inequities and description of ways to analyze them, see Bird and Miller (1984).

16. Bird and Miller (1984) describe the use of results from a special survey to analyze both horizontal and vertical aspects of various tax policies in Jamaica.

17. In this discussion we take marginal cost pricing as the proper benchmark for measuring tax or subsidy elements in prices. A discussion of the relative merits of using average and marginal cost pricing as the basis for comparison would take us too far afield, but the modifications are clear.

18. A final problem in the choice of which taxes to include is well illustrated by the following quotation from a document published by the U.S. Treasury Department (1977):

> Present law does not tax the interest on municipal bonds; therefore, a holder of such bonds receives less interest than he might receive if he invested his funds in fully taxable securities. The difference between what he receives and what he could receive is his implicit tax. It is implicit because no revenue is paid to the U.S. Treasury. It is nonetheless a tax because the bondholder's after-tax income is reduced in the same way as if he paid a tax....

> There is an implicit tax corresponding to many tax benefits to capital income .... Implicit taxes make the present tax structure as measured by effective tax burdens somewhat more progressive than it may at first appear.

Taking account of these implicit taxes in developing countries might be an almost insurmountable task, given the lack of readily available data on returns to various types of investment. Moreover, they may be somewhat less important in developing countries than in developed countries a) because capitalists may not make marginal investment decisions with the same precision found in (or at least attributed to capitalists in) developed countries and b) because taking account of implicit taxes would change the estimated incidence within a relatively small fraction of the population at the very top of the income scale that pays income tax.

19. But see Browning (1978) and (1985). As noted earlier, import duties also act as a subsidy to protected domestic producers. They may also burden other export industries.
20. For a summary of this literature and further references, see Musgrave and Musgrave, (1980), Ch. 19.

21. This line of reasoning is suggested by the analysis in Ballentine Thirsk (1977).

22. See Mieszkowski (1972), Aaron (1975), and McLure (1977). For an extended discussion of the incidence of the property tax in developing countries, including additional refinements and references, see McLure (1979).

23. For a discussion of these circumstances in a slightly different context, see Gillis and McLure, (1975). Dominance of the world market by taxing nation(s) is generally required if such taxes are to be shifted to consumers. See also McLure (1981a), (1983a), and (1983b). If export duties result in devaluation, part of their burden is shared by consumers.

24. Bird and De Wulf (1973) clearly recognize the importance of the list of taxes subject to analysis, for they note whether social security taxes, earnings on differential foreign exchange rates, and fees are analyzed in each country. Even so, one can determine whether the particular choices made in specific studies follow a clear cut rationale, instead of being haphazard, only by reading the original studies. Unfortunately even a careful reading is not adequate to this task if the author has failed to explain the choice of taxes included.

25. For a more detailed discussion of the pitfalls in using standard incidence assumptions for the corporate income tax, see McLure (1981b).

26. Again, Bird and De Wulf (1973) recognize the importance of incidence assumptions, devoting three and one-half pages to their attempt to categorize and appraise the assumptions made in the studies surveyed. But once again it is difficult to know whether the assumptions made in a given country reflect careful analysis or the myopia of the analyst. This being the case, we have yet another reason to be suspicious of any efforts at comparisons across countries or time.

27. This point is made with particular force in DeWulf (1975), pp. 96-98. Bird (1980, p. 77) has written, "Empirical studies of the extent of income redistribution through the fiscal system have clearly opted for scope rather than reliability, so it should not be surprising that the significance of the results of such studies must be regarded with great doubt." General equilibrium analysis is somewhat less vulnerable to this objection.

28. For a provocative example of the analysis of the incidence of changes in indirect taxation, see Bird and Miller (1984).

29. Exceptions would be totally vertically integrated production (including some services), direct imports by consumers, and sales of imports not subject to VAT at the border or subsequent preretail sales.
30. This discussion is couched entirely in terms of the credit method of implementing a VAT. Focus on tax liability at the retail level would never be satisfactory under the subtraction method, except in the cases listed in footnote 29 above. Feeding prior-stage taxes through the input-output analysis (described below) should be somewhat simpler for the "naive subtraction method" (a term given the standard textbook description of the subtraction method in McLure, forthcoming, 1986), but not for the "sophisticated subtraction method" (also described there).

31. See Aaron (1968) for an early attempt to utilize input-output analysis to determine the differential price effects of a gross product type VAT. The methodology of the Aaron analysis appears to be most appropriate for a subtraction method VAT. Thus it does not address the difficulties noted in the remainder of this paragraph.

32. It would, of course, be unusual that a model would have enough disaggregation to allow distinction between exempt small businesses and other businesses.

33. Because housing, financial services, and other services are not really tax-free in the typical European VAT, Ballard, Scholz, and Shoven's estimates of welfare loss probably understate the relative neutrality of the differential rate VAT. Because some breaks in the chain of credit are virtually inevitable for administrative reasons (e.g., for financial services), any flat rate VAT levied in the real world is not likely to be as neutral as this study suggests.
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