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by

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ABSTRACT

Although economists have long been concerned with the effects of government activities (especially taxes) on the size distribution of income, there has recently been a growing interest in other dimensions of income distribution, e.g., among regions, age groups, etc. In this paper we have documented this development, and have examined some of the possible reasons and justifications for it. In addition, we have shown the danger in the common practice of looking only at average taxes paid or average benefits received within any given group, when there is significant variation within the group. Finally, in connection with efforts to relate the distribution of benefits from a particular program to the distribution of taxes paid for it, we have pointed out the conceptual and empirical difficulties of specifying who pays the taxes for any single government program.

The distribution of benefits from government programs is a matter of growing interest. In this paper we point out the variety of ways in which distributional effects have been examined in recent research and consider possible justifications for the varying perspectives. In addition we show that serious conceptual and empirical problems arise in linking the distribution of benefits--however that distribution is viewed--to the distribution of tax burdens.

Dimensions of Distributional Effects

Because of economists' long-standing concern with the size distribution of income, empirical work on the distributional effects of both taxes and public expenditures has concentrated on the income level of beneficiaries.[1] Yet a perusal of the literature shows that beneficiaries have been classified on a wide variety of bases other than income. There have been studies of the geographic distribution of program benefits, e.g., involving such diverse programs as federal water resource expenditure and defense.[2] Other studies show the distribution by demographic variables: e.g., a recent Social Security Administration report showing the distribution of government outlays for "personal health services (mainly Medicare and Medicaid)" by the age of the recipients;[3] unpublished reports of the U.S. Office of Education indicating the extent to which college students of different racial and ethnic backgrounds benefit from federal student financial aid expenditures;[4] and a public education study classifying beneficiaries and taxpayers by "stage in adult unit life cycle"--marital status, age of head, and ages of children.[5] Finally, there are studies that examine

benefits by a variety of other characteristics, e.g., farm subsidies by size of farm and type of crop,[6] OASDI pensions benefits by industry (retail trade, manufacturing, mining, etc.),[7] and higher-education subsidies to students by type of college attended.[8]

Justifications for Using Various Distributional Dimensions

Given the economist's traditional interest in the size distribution of income, there is a clear case for examining the distribution of program benefits and tax burdens by income level of the unit involved. But why use other classification schemes? One answer is that the data required to estimate these distributions by level of income are not always available, in which case the use of other classificatory variables may sometimes be justified on the ground that they are proxies for income. When the cost of redistributing income--costs of identifying "the poor," of administering programs specifically for them, and the stigma costs associated with participation in programs only for the poor--are considered, it may be more efficient to redistribute income by area, color or age, as proxies for "poverty," than to redistribute it directly by level of "income"; if the prevalence of low-income people in any of these groupings is relatively high, if persons in the group can be easily identified, and if membership in the group is not easily subject to voluntary change, then the use of one of these proxies for income will be an efficient method of redistributing to the poor.[9] Similarly, when we consider the costs of obtaining data for such programs on the distribution of benefits among persons classified by "income," it may be efficient to settle for proxies such as the distribution of benefits by age or geographic area.

Even when data are inexpensively available, however, there may still be a case for examining the benefit and burden distributions by characteristics other than income. Thus, a second answer to the question of why economists may be concerned with distributional effects other than by income class is that the economist's traditional concern--at the conceptual level--has been not with the size distribution of current money income, as commonly measured, but rather with "economic welfare," as might be reflected by the distribution of lifetime real income. To the extent that current income is an imperfect proxy for lifetime income, and money income is an imperfect proxy for real income, then the search for better measures is understandable. The use of distributions based on such variables as age, race, and region could reflect, at least in part, concern not with these variables per se, but with their use as proxies for the distribution of lifetime real income.

The deficiencies of current money income as a measure of lifetime real income have been documented in a number of ways. In an earlier paper we showed that because of systematic variation in the ratio of current money income to wealth holdings, money income gives a deceptive picture of real purchasing power.[10] The inadequacy of money income as a measure of real income is reflected in the Social Security Administration definition of "poverty" which adjusts for the nonmoney income of farm families.[11] That current money income is often a poor proxy for future money income, especially for young persons investing in their own human capital through education or training, is well recognized. Hence we have part of the answer to the question, Why examine the distributional effects of government activities among people classified

by variables other than income, even when income data are available? The answer may be that it is "income" in which we are interested, but since current money income is such a poor measure of real lifetime income, some other measure may be preferred to current money income.

A third answer is that interest in the distribution of taxes and/or benefits among geographic regions, ethnic groups, and races may reflect political pressures such as the power of particular groups or the fact that the Constitution recognizes states or provinces.[12] If the French-speaking population of Quebec, for example, act as though the distribution of federal taxes and program-benefits between their province and the rest of Canada is a proper objective of social policy, then there is, ipso facto, a case for obtaining information on this (geographic) distribution. The same reasoning applies to people in Appalachia and to blacks in the U.S. This is not to deny that poverty in Quebec, in Appalachia, or among blacks is high relative to the national average; rather, it is to say that the distributional effects of government activities on these groups may be of concern independently of the effects on the nation's size distribution of individual income.[13] Public services to persons in these groups may be thought of as collective-consumption, or "public," goods for all members of the group, and taxes paid by the group are a collective-consumption "bad" for all members.

Some Consequences of Alternative Classification Schemes

Whatever the rationale for classifications by variables other than individual income, it is important to note the dispersion of income within these groups. The point is that equalization of per capita incomes among groups can actually make the size distribution of income

among persons more unequal. This would be the case if, for example, the bulk of benefits from a program in a low-income area were received by high-income persons.

We have suggested that there are various justifications for classifying people in ways other than by income. Whatever the classification principle, however, it is important to have information not simply about the average effects on all the people in each class, but also to note how equally the effects are distributed among the persons in the class. For example, if one looks at the distribution of program benefits (or taxes) among persons within income classes, then the income variance within each class will be "small" (or even zero, depending on the class interval) but the variance in benefits received within any class may well be large, since some persons in the income class may be ineligible for the particular program or, even if eligible, may receive few benefits or none. By contrast, if one looks at the distribution of program benefits among persons grouped by amount of benefits received, then there will be little or no within-class variance of benefits but possibly quite large within-class variance in income, since the receipt of benefits may not be entirely conditioned by income level.[14]

These two ways of looking at the relationship between income and benefits (or taxes)--by size-of-benefit (or tax) group or by size-of-income group--can be illustrated by two recently published papers. One shows the average (parental) income of students grouped by the amount of benefits received from each of the three public higher education systems in California.[15] A second paper proposes an alternative way of viewing the data; it shows the average benefits received within income

classes.[16] For illustrative purposes, condensed and edited versions of both of the tables are shown below.

The two tables actually use identical data but aggregate them differently: Table 1 focuses attention on income by benefit level, without regard for the variation in income within each of the benefit-size groups, whereas Table 2 focuses attention on benefits by income level, without disclosing the variation in benefits within each income-size class.[17] Another way to see the difference between the two tables is to note that the Table 1 approach shows the subsidies and parental income only for persons who actually received benefits, while all those persons who received no benefits were grouped into a single class. Table 2, by contrast, shows for each income group an average of the substantial subsidies received by a small fraction of the persons in each income class and the zero subsidies received by the (varying) majority of persons in each income class.

Both approaches seem "relevant." It is useful to know not only the extent to which average subsidies vary by income level (Table 1), but also the extent to which average incomes vary by level of subsidy received--among the three school (subsidy) programs (Table 2). Students attending each of the three higher-education systems can be viewed as representing distinguishable groups that are worthy of being studied, just as residents of different regions or persons of differing ages may constitute groupings with which public policy is interested.

This conclusion follows from the fact that different levels of subsidies received by college students in the three separate systems do not reflect simply consumer preferences; they reflect public

Table 1

Relationship between Average Annual Public Higher-Education Subsidies and Average Parental Income, by Level of Subsidy (Type of College)

Size of Public Higher Education Subsidies (and type of College) (1)	Average Parental Income (2)	Ratio of Subsidies to Parental Income (1)÷(2) (3)
$ 0 (No College)	$ 7,900	0
720 (Junior Colleges)	8,800	.082
1,400 (State Colleges)	10,000	.140
1,700 (University)	12,000	.142

Source: Derived from W. Lee Hansen and Burton A. Weisbrod, "The Distribution of Costs and Direct Benefits of Public Higher Education: The Case of California," Journal of Human Resources 4 (Spring 1969), Table 10 (lines 3 and 2), 190.

Table 2

Relationship between Average Annual Public Higher-Education Subsidies and Parental Income, By Level of Parental Income

Level of Parental Income (1)	Average Public Higher Education Subsidies (2)
$ 0-3,999	$ 56
4,000-5,999	122
6,000-7,999	129
8,000-9,999	126
10,000-11,999	179
12,000-13,999	167
14,000-19,999	229
20,000-24,999	271
25,000 and over	291

Source: Joseph A. Pechman, "The Distributional Effects of Public Higher Education in California," Journal of Human Resources 5 (Summer 1970), Table 3, panel B, cols. 1 and 3, 366.

decisions--on student eligibility, campus location, expenditure per student, and tuition for each of the three systems of higher education.[18] These public decisions have been made in such a way--not necessarily intentionally--that: (1) Higher-income students are disproportionately eligible to attend schools where the legislature has made expenditures (subsidies) per student the highest. (2) The legislature has made or permitted to be made location decisions such that attendance at schools with higher subsidies is more likely to require incurring the costs of living away from home, thus tending to handicap lower-income students. (3) The legislature has adhered to policies producing only small differences in tuition levels in the face of large differences in public expenditures per student in the three systems, thereby making tuition a smaller fraction of income for higher-income students.[19]

Without a further specification of precisely why one is examining a distribution, it is impossible to say which of the two approaches contrasted here is most important. Both have a story to tell. In future work on the distributional effects of public programs it would be useful to have information displayed in both ways.

The Distribution of Taxes That Finance Specific Programs

Assume that the distribution of benefits from some particular public-expenditure program has been identified, whether among people grouped by income or in another way. It then seems reasonable to ask, What is the corresponding distribution of the taxes that pay for these benefits? With this information, net redistributive effects could be estimated. Several recent papers have made statements about these tax

allocations, and we can expect more to result from the growing interest in distributional effects of public expenditure programs.[20]

What can be said about the distribution of burdens of the taxes for a particular public program? If one percent of a government's total expenditures go for a particular program, can it be said legitimately that this same proportion of each and every tax dollar paid by every group of taxpayers--whether they are classified by income or something else--goes to support that particular program? We believe the answer is no. It is surely a logical fallacy to assume that what is true for a total is true for each of its parts. When the federal government tells us that 27 cents out of every tax dollar we pay goes for national defense, it is explaining the budget to the average citizen; it is not reflecting the wisdom of economic analysis. There is no nonarbitrary way to say which tax dollars and whose tax dollars go to finance any particular expenditure!

This last statement is too strong. We do not mean that there is no way to get at the question of who pays for the taxes for a particular public program, but only that the proportional allocation assumption has no logical foundation. Actually, one can make sense of the question of who pays for a given program by rephrasing the question in marginal terms. Thus one should ask: If expenditures on some program were reduced (or increased), ceteris paribus, which taxes, falling on which taxpayers, would be cut (or raised)? This is, of course, a factual question, although since it is hypothetical the facts are by no means easy to adduce. It seems clear, however, that there is no reason to expect an equiproportional cut (increase) in the taxes paid by persons

in every income class (or whatever other set of classes is considered); yet this is precisely the assumption that is implicit in a number of recent studies.[21]

The tax-allocation problem is not eliminated even when "earmarked" taxes are employed to finance some public expenditure. If we want to determine who is paying for local public school expenditures, for example, we would need to ask whose taxes would be reduced (or increased) if public expenditures on schools were decreased (or increased). If expenditures were cut or even eliminated, there is little reason to believe that only the "earmarked" tax on real property would be cut. While this tax would be cut somewhat, so might other local and state taxes, and so might user charges for school books and instructional materials.

We conclude that there is no simple basis for allocating tax burdens for any particular public expenditure program.[22] The equiproportionality assumption is quite arbitrary, and the marginal approach, while conceptually correct, presents data requirements that are virtually impossible to meet.

This is not, we believe, a counsel of despair, but rather a counsel of caution. Before a researcher automatically assumes that the <u>average</u> tax allocation applies to <u>changes</u> in expenditures on each and every program, he should ask whether he really believes that the average allocation is a good proxy for the marginal allocation which is conceptually relevant. If his answer is no, then the use of the current average allocation of taxes by income or other classes is no more justifiable than any random set of numbers.

One might attempt to justify the use of the (admittedly convenient) average tax allocation as a proxy for the marginal on the ground that

if a number of expenditure programs were expanded or contracted, the allocation of taxes among taxpayer groups would remain proportionately unchanged. One can, perhaps, appeal only to intuition as to whether this is a reasonable assumption; our own conjecture is that it is not. In fact, both the mix of expenditure programs and the mix of taxes have been shifting, enough we suspect to make this assumption an unreasonable one.

Given a desire to examine the redistributive effects of public expenditure programs, and in the absence of estimates of the marginal distribution of tax burdens to finance any particular program, our judgment is in favor of concentrating solely on the distribution of benefits. If a comparison with taxes is to be made, we suggest some magnitude, such as total taxes paid, which does not require a determination of whose tax dollars finance a particular program.

Summary

Although economists have long been concerned with the effects of government activities (especially taxes) on the size distribution of income, there has recently been a growing interest in other dimensions of income distribution, e.g., among regions, age groups, etc. In this paper we have documented this development, and have examined some of the possible reasons and justifications for it. In addition, we have shown the danger in the common practice of looking only at average taxes paid or average benefits received within any given group, when there is significant variation within the group. Finally, in connection with efforts to relate the distribution of benefits from a particular program

to the distribution of taxes paid for it, we have pointed out the conceptual and empirical difficulties of specifying who pays the taxes for any single government program.

NOTES

[1]Among the more noteworthy examples in the taxation area are Richard A. Musgrave et al., "Distribution of Tax Payment by Income Groups: A Case Study for 1948," National Tax Journal 4 (March 1951), 1-53; George A. Bishop, "The Tax Burden by Income Class, 1958," National Tax Journal 14 (March 1961), 41-59; and Gerhard N. Rostvold, "Distribution of Property, Retail Sales, and Personal Income Tax Burdens in California: An Empirical Analysis of Inequality in Taxation," National Tax Journal 19 (March 1966), 38-47; Economic Report of the President (January 1969), p. 191. For additional references see Carl S. Shoup, "Quantitative Research in Taxation and Government Expenditure," presented at National Bureau of Economic Research Meeting, Washington, D.C., December 4, 1970.

For one of the most recent and comprehensive studies, which allocates both taxes and benefits by income level, see W. Irwin Gillespie, "Effect of Public Expenditures on the Distribution of Income," in Richard A. Musgrave (ed.), Essays in Fiscal Federalism (Washington, D.C.: The Brookings Institution, 1965), pp. 122-86.

[2]Robert H. Haveman, Water Resource Investment and the Public Interest (Nashville, Tenn.: Vanderbilt University Press, 1965), chap. 4; Murray Weidenbaum, The Modern Public Sector (New York: Basic Books, 1969), pp. 177-82.

[3]Barbara S. Cooper and Mary McGee, "Health Care Outlays for the Young, Intermediate, and Older Age Groups," Research and Statistics Note, U.S. Department of Health, Education, and Welfare, Social Security Administration, Note No. 17--1970, p. 5.

[4]For some of the types of data available, see W. Lee Hansen, "Financial Barriers to College Attendance," in Trends in Post-Secondary Schooling (Washington, D.C.: U.S. Government Printing Office, 1971), forthcoming.

[5]James N. Morgan, Martin H. David, Wilbur J. Cohen, and Harvey E. Brazer, Income and Welfare in the United States (New York: McGraw-Hill, 1962), Table 19-10, p. 302.

[6]James T. Bonnen, "The Absence of Knowledge of Distributional Impacts: An Obstacle to Effective Public Program Analysis and Decisions," in U.S. Congress, Joint Economic Committee, The Analysis and Evaluation of Public Expenditures: The PPB System, vol. 1, pp. 419-49; Charles Schultze, "The Distribution of Farm Subsidies: Who Gets the Benefits?" (Washington, D.C.: Brookings Institution, unpublished paper, 1969)

[7]Henry Aaron, "Social Security: International Comparisons," in Otto Eckstein, ed., Studies in the Economics of Income Maintenance (Washington, D.C.: Brookings Institution, 1967), Table 4, p. 68.

(Notes cont'd)

[8]W. Lee Hansen and Burton A. Weisbrod, Benefits, Costs, and Finance of Public Higher Education (Chicago: Markham Publishing Co., 1969), chap. 4.

[9]Burton A. Weisbrod, "Collective Action and the Distribution of Income: A Conceptual Approach," in Analysis and Evaluation of Public Expenditures, vol. 1, pp. 177-98.

[10]W. Lee Hansen and Burton A. Weisbrod, "An Income-Net Worth Measure of Economic Welfare," American Economic Review 58 (December 1968), 1315-29.

[11]Mollie Orshansky, "Counting the Poor: Another Look at the Poverty Profile," Social Security Bulletin (January 1965), pp. 9-10.

[12]For a recent discussion of the theoretical relevance of such identification for determination of "appropriate" governmental units, see Douglas G. Hartle and Richard M. Bird, "Criteria for the Design of Governmental Decision-Making Units," Institute for the Quantitative Analysis of Social and Economic Policy, University of Toronto (June 1969, mimeo).

[13]See Martin C. McGuire, "Program Analysis and Regional Economic Objectives," in Analysis and Evaluation of Public Expenditures, vol. 1, pp. 592-610.

[14]The "concern" over those million-dollar-income taxpayers who pay no federal income taxes, even though most high-income recipients pay substantial taxes, can be interpreted as an example of implicit attention to the fact that aggregating taxpayers by income and then looking only at average tax payments hides some noteworthy variation around that average.

[15]W. Lee Hansen and Burton A. Weisbrod, "The Distribution of Costs and Direct Benefits of Public Higher Education: The Case of California," Journal of Human Resources 4 (Spring 1969), 176-91.

[16]Joseph Pechman, "The Distribution Effects of Public Higher Education in California," Journal of Human Resources 5 (Summer 1970), 361-70.

[17]Robert Hartman pointed out the difference in points of view in "A Comment on the Pechman-Hansen-Weisbrod Controversy," Journal of Human Resources 5 (Fall 1970), 519-23.

[18]Similarly, the distribution of agricultural subsidies, within a context of output or acreage quotas, reflects public decisions to offer differential subsidies to wheat, soybean, and vegetable growers--subsidies for which all farmers cannot qualify. (We owe this example to Eugene Smolensky.)

(Notes cont'd)

[19]For data on the proportions of students, by family income level, eligible to attend each of the three systems, and the proportions actually attending each system, see W. L. Hansen and B. A. Weisbrod, Benefits, Costs and Finance of Public Higher Education, chap. 4.

[20]Douglas M. Windham, The Redistributional Effects of Public Higher Education in Florida, Monogr. Ser. F, No. 1, Department of Economics and Business Administration (Greensboro: University of North Carolina, September 1969); Richard W. Judy, "On the Income Redistributive Effects of Public Aid to Higher Education in Canada," Institute for Quantitative Analysis of Social and Economic Policy, University of Toronto (September 1969).

Robert Hartman adopts implicitly the arbitrary equiproportional tax-allocation assumption in discussing the tax source of funds that finance agricultural subsidies: "Assuming that two percent of the taxes of the rich went to pay for agricultural subsidies (agricultural subsidies were about two percent of federal nontrust fund outlays in fiscal 1968), . . ." (Hartman, "Comments," p. 521, n. 5.)

T. W. Schultz also assumes, implicitly, that one can identify the tax source--by income level of taxpayer--for a particular expenditure program: "To the extent that the public and private funds that are allocated to schooling and higher education are obtained in a progressive manner either by taxation or as gifts, the implication is, leaving other effects aside, that the revenue thus acquired to support education tends to equalize the distribution of personal income" ("Human Capital: Policy Issues and Research Opportunities," University of Chicago, Department of Economics, Human Capital Paper No. 70:10, January 7, 1971, p. 31).

James T. Bonnen appears to say that one must be arbitrary in assessing the distribution of tax burdens for a single expenditure program: "In the situation where the program is funded out of general revenues, one has to assume a cross section of the revenue sources in structuring one's analysis of the distribution of burden" ("The Absence of Knowledge of Distributional Impacts: An Obstacle to Effective Policy Analysis and Decisions," in Robert H. Haveman and Julius Margolis, eds., Public Expenditures and Policy Analysis [Chicago: Markham Publishing Company, 1970], pp. 249-50).

[21]See note 20 above. For more detail on this point, see W. Lee Hansen and Burton A. Weisbrod, "The Distribution Effects of Public Higher Education in California: Reply," Journal of Human Resources, forthcoming.

One recent study is concerned with the allocation of all taxes, and, hence, it does not face the difficulty of assessing the allocation of tax burdens for any particular expenditure program. See Gillespie, "Effect of Public Expenditures."

(Notes cont'd)

[22]An analogous problem arises when efforts are made to allocate the expenditures on particular public programs in order to say on whose behalf such expenditures were made. This is sometimes done as a means of estimating the distribution of benefits (see Gillespie, "Effect of Public Expenditures"). One could simply (and arbitrarily) prorate these expenditures equally among all the relevant population, analogous to the tax allocation discussed above, or one might prorate them according to income or something else. But, in the case of collective consumption goods, the marginal cost of providing the service to a consumer is surely less than average cost, and is zero in the pure public goods case. Hence the prorating allocation would give incorrect estimates of the costs incurred to serve a marginal consumer.