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INCOME REDISTRIBUTION THROUGH LOCAL
GOVERNMENT FISCS

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ABSTRACT

This paper is concerned with problems of measuring the redistribution that results from local government fiscal activity. Five major conceptual problems encountered in this measurement exercise are discussed and certain preferred procedures are indicated for estimating the benefit incidence and burden incidence of local fiscal activity. A numerical example based on state and local health and welfare expenditures in the Washington metropolitan area is used to contrast estimates based on the argument of this paper with estimates calculated in the traditional manner. As a result of this numerical exercise the magnitude of the redistribution usually reported by incidence studies is drawn into question. In the final section this and other implications of the analysis are discussed.

INCOME REDISTRIBUTION THROUGH LOCAL GOVERNMENT FISCS

I. Introduction

The question of redistribution through local public fiscs is
bedeviled with terminological obscurities, unresolved theoretical
problems, and the lack of empirical data. The following sampler of
the disparate and at times mutually contrary propositions found in
the literature regarding redistribution will serve to describe current
opinion and point up certain inconsistencies in that opinion:

1. Massive redistribution in favor of the poor is accomplished
through local government expenditures and taxes. In fact, more
redistribution is reported achieved through local than through federal
fiscal activity [Gillespie (1965); Tax Foundation (1967); and
Musgrave, Case, and Leonard (1974)].

2. But the validity of the estimated ratio of net benefits to
income for low-income classes as reported in these incidence studies
can be challenged. Two technical considerations concerning the measure-
ment of income have offsetting effects. The income measure used in the
denominator of the net benefit-to-income ratio should be (a) some
"target income," measure, say the "poverty income level," rather than
actual reported income of the very low-income classes [Albin (1972)];
and (b) a permanent income measure that nets out negative transitory
income, rather than annual income. Further, the cost-of-service
imputation of benefits used in these studies is invalid because it
does not allow for externalities nor variation in citizens' marginal
evaluations of public services [Greene, Neenan, and Scott (1974)].

3. The proper amount of income redistribution should be determined at the national, not the local, government level [Stigler (1957)].

4. Some redistributional programs, such as compensatory educational efforts, should be directly administered by local governments even if financed by higher-level governments [National Educational Finance Project (1971)].

5. If central-city governments wish to reduce the tax burden on their low-income residents, their appropriate strategy is, paradoxically, to adopt expenditure and tax policies that increase the fiscal residuals of middle- and upper-income citizens [Buchanan (1971)].

6. Survey data indicate that large numbers of high-income citizens favor redistributive programs, such as compensatory education, that are provided by local governments [Watts and Free (1973)].

7. The general equilibrium burdens of local redistributive programs will fall upon immobile factors within the locality, who may or may not be those initially assigned the burdens. (See neo-Richardian general equilibrium incidence models, for example, Getz (1975)).

8. Within a utilitarian model it can be shown that the maximization of the sum of individual utilities may well be achieved by skewing expenditures in favor of the disadvantaged (that is, making expenditures "input-progressive") [Arrow (1971)]. However, if public expenditures are highly complementary with, rather than a substitute for, "advantage," then the socially optimum policy as defined by the utilitarian criterion may require favoring the advantaged in the distribution of public services [Green and Sheshinski (1975)]. In other words, the socially optimal amount of redistribution continues to be an open question.

Propositions 1 and 2 relate to basic questions concerning the measurement of redistribution. Propositions 3, 4, 5, and 6 are positive and normative statements concerning the appropriate fiscal agenda for local governments. Proposition 7 reveals some indication of the preferences of individual citizens regarding redistribution. Proposition 8 includes two recent judgments concerning redistribution that stem from one ethical tradition, utilitarianism. These eight propositions are suggested as major themes relevant to local income redistribution policy that currently enjoy, if not the acceptance of conventional wisdom, at least widespread currency. They will be briefly discussed in section IV in the light of the analysis of this paper. Primary focus will be on questions of measurement, with some attention given to the consequences expected to follow from whatever redistribution is accomplished through local governments. The important ethical questions encountered in any discussion of redistribution will be largely ignored. Throughout the discussion, however, the ethical position generally characterized as individualism will be assumed, though not necessarily embraced. The discussion to follow can be divided into three parts: (1) problems with the measurement of redistribution, (2) a numerical illustration of redistribution in one metropolitan area, and (3) summary remarks and a few directional arrows indicating whither the trail may be leading.

II. Measurement of Redistribution

The redistributive effect of local government fiscal activity is the net result of the benefit incidence and burden incidence of such activity. In this section an operational definition of redistribution will be developed in the course of discussing five major conceptual problems associated with benefit-incidence estimation.

A. General Equilibrium Effects

General equilibrium effects have been ignored in the major benefit-incidence studies [see, for example, Gillespie (1965) and Tax Foundation (1967)]. Musgrave, Case, and Leonard (1974), for example, estimate that in 1968 benefits from state and local government health and hospital expenditures ranged from 5.7 percent of "total income" for households in the under-$4000 income class to 0.1 percent for households with "total income" of $35,500-$92,000. How should we interpret these percentages? Prima facie they appear to mean that, if state and local expenditures for health and hospitals were eliminated, real money income would fall 5.7 percent for households in the under-$4000 income class and 0.1 percent for households in the $35,500-$92,000 income class. However, this could be true only under the very strong assumption that the total elimination of these government expenditures would have no general equilibrium impact on income distribution. But if state and local expenditures for health and hospitals were reduced to zero, there would be significant offsetting tax/expenditure/borrowing adjustments. Private spending for such services would certainly increase. As a

consequence of these adjustments, earned income and property income
patterns would be altered, a new tax incidence pattern would emerge,
and the benefit incidence of other government outlays would change. It
might be possible to make some qualitative judgment concerning the net
impact of all these adjustments, but certainly there is no basis for
concluding precisely that there would be "a reduction of 5.7 percent
for households in the under-$4000 income class and 0.1 percent for
households in the $35,500-$92,000 income class." In other words, the
basic criticism of defining benefit incidence to be the change in income
distribution as the result of going from a hypothetical no-government
economy to one with government is that it is impossible to infer the
no-government distribution from the distribution that exists with public
outlays constituting one-fourth or more of GNP [Prest (1971), p. 88].

Musgrave's concept of "differential incidence" is designed to address
this general equilibrium problem. His statistic purports to measure
the gain (burden) that results from substituting the actual benefit
(tax) structure in place of a normative benefit (tax) structure. [For
estimates of differential tax incidence, see Musgrave, Case, and
Leonard (1974), Table 4]. Even though the general equilibrium problem
is not fully resolved by this procedure, at least the principal macro
(that is, deflationary/inflationary) effects of budgetary changes are
neutralized. The differential tax incidence is the difference between
the actual incidence and the incidence under some normative tax regime,
such as a proportional income tax. Such an approach is useful for
estimating tax incidence to the extent that a proportional income tax
possesses attractiveness as a normative benchmark, but if we wish to

compute differential <u>benefit</u> estimates we possess no such incidence

pattern that is intuitively attractive as a norm for comparison with

the actual pattern.

Behrens and Smolensky (1974) have proposed an answer to this

problem. They define differential incidence, that is, the redistribution

achieved through government expenditures and taxation, to be the

difference between a primary or benchmark distribution of income and

a final distribution.[1] They identify four possible definitions of the

primary distribution. First, they indicate that the primary distribution

could be that which would exist if there were no government. Such a

primary distribution is the benchmark implicit in the Musgrave, Case,

and Leonard (1974) results and in most incidence studies. This no-

government distribution of income is rejected by Behrens and Smolensky

as an inappropriate primary distribution.

Behrens and Smolensky identify a Lindahl primary distribution, which

is defined as "that arising from the private sector plus the allocative

activities of the public sector" (p. 318) if there were a Lindahl

equilibrium, that is, if marginal benefit taxation were fully implemented.

On the basis that Pareto-optimal redistribution is an allocative

function that generates benefits for taxpayers as well as for transfer

recipients, Behrens and Smolensky distinguish between Lindahl I and

Lindahl II primary distributions of income. The Lindahl I primary

distribution includes both the donor and the recipient benefits of

Pareto-efficient transfers, with the consequence that efficient

transfers do not give rise to redistribution. In the Lindahl II case,

the recipient benefits are excluded from the primary distribution and

so constitute a source of redistribution when calculated in the final distribution of income.

Behrens and Smolensky's fourth definition of the primary distribution of income is an "optimal one," however one wishes to define optimality. Redistribution in this instance would be "the difference between the actual fiscal treatment individuals receive and the way they would be treated if the optimum distribution were achieved" (p. 319).[2] The use of such terminology to define the primary distribution leaves the way open to choose other ethical criteria than the individualistic ethic implicit in the Lindahl formulation.

Illustrative estimates to be given in section VII will be approximations of the Lindahl II redistribution as defined by Behrens and Smolensky. The Lindahl II primary distribution, as they precisely define it, will not be the counterfactual used to estimate the redistribution achieved. To estimate this counterfactual we would need to know the values that would place all citizens in a Lindahl equilibrium such that each citizen's marginal tax payment would equal the sum of his marginal nontransfer benefits from government services and his marginal donor benefits from transfer programs. In place of this primary distribution we will for illustrative purposes employ an approximation of it.[3]

B. Rivalry in Consumption

Despite the clear implications of the contributions of Samuelson, Musgrave, Buchanan, and others to the theory of demand for government services, benefits have typically been imputed on the basis of the

costs incurred in behalf of direct recipients rather than the utility received by individuals from public programs [see, for example, Musgrave, Case, and Leonard (1974), pp. 16-17]. But major conceptual and empirical problems must be resolved before benefits from government services can be allocated on the basis of the utility they generate. Specifically, (1) the relative publicness and privateness of the benefits generated and (2) the values of the benefits received by various groups of citizens must be determined.[4] Publicness of a government service can arise from one or more of three reasons: (1) nonrivalry in its direct consumption, (2) the external benefits it generates for others than the direct recipients of the service, and (3) Pareto-optimal redistribution. In all three instances the service "enters two or more persons' utility" [Samuelson (1969), p. 108].[5]

Several recent studies examine the question of publicness by attempting to measure one of its sources, rivalry in the consumption of public services. For example, Borcherding and Deacon (1972) assume that all citizens receive an equal physical share of a public service, q; with the magnitude of q depending only on rivalry in consumption of the service.[6] To measure this rivalry they define a "capturability parameter", α, with

$$q = \frac{X}{N^{\alpha}}$$

where q = the amount of the physical output
of the public service captured by
the median voter (and by each voter)

X = the physical output of the public
service

N = the number of citizens in the
jurisdiction

with α unity if the output is a purely
private service, zero if it is purely
public, and ranging between zero and
unity for intermediate services.

From 1962 aggregate state data, Borcherding and Deacon estimate values

of α that range from 0.87 to 1.09 for eight categories of state and

local expenditures,[7] thus generally indicating complete rivalry in the

consumption of these services. Borcherding and Deacon do indeed urge

caution in interpreting their results and point out that "normative

conclusions drawn from the finding that the goods appear better classi-

fied as private or quasi private rather than public are highly

conjectural" (p. 900). Such a caution does appear to be appropriate

since they employ rather restrictive assumptions in their analysis and

their definition of publicness includes only one of the three sources of

publicness.

Borcherding and Deacon employ a Cobb-Douglas production function,

with the dual implication that they can measure public service output

and that there are constant returns in the public sector. Both of

these propositions are problematical. Further, the highly aggregated

data employed tend to wash out effects that may be critical for measuring

the impact of congestion costs. Thus "total state population" does

not appear to be an appropriate measure of the congestion that may exist

in the elementary schools, public hospials, and public parks within

the state. In addition, no attempt is made to control for the consider-

able variation across the states in the size of the private sectors

in higher education, elementary and secondary education, hospitals,

and recreation.[8] If the more populous states also happen to be the

states with the larger private sectors, the estimated values of

θ will be negatively biased, thus resulting in biased estimates of the

capturability parameter.[9] Finally, since mean values are used in

the regressions, the effect of the variance in variables such as income

on the demand for public services is eliminated.

The principal point I wish to make, however, pertains to the fact

that Borcherding and Deacon define the quantity (and/or quality?) of a

public good received by any one citizen as exclusively a negative

function of the numbers served $\left(q = \dfrac{X}{N^{\alpha}} \right)$. Thus in the limit a

service is said to be purely public when α is zero, with each citizen's

enjoyment of a service independent of the number of citizens sharing in

it. A swimming pool is a good example of what they have in mind. Up

to a point, additional bathers are accommodated without inconveniencing

those already in the pool. In this instance α would equal zero. After

a certain point, however, additional swimmers increasingly become

nuisances, until finally rivalry in consumption is so complete that the

service must be considered a private good. At this point α equals unity.

The absence of congestion costs is indeed potentially a source of

publicness for many services, but externalities and Pareto redistribution

can also be important sources of publicness. So even if the capturability

parameters calculated by Borcherding and Deacon do mean that there is

considerable rivalry in the consumption of state and local public services,

we cannot necessarily conclude that therefore they can be efficiently

financed exclusively through the market.[10]

C. Externalities

In addition to the nonrivalry that may be present in the direct consumption of a service, publicness can also result from the generation of two forms of externalities arising from the provision of a service: (1) nonredistributive external benefits and (2) Pareto-redistributive benefits. Nonredistributive external benefits are generated, for example, by public health and hospital programs, to the extent that parties other than those directly treated at the time feel they benefit from the higher level of community health resulting from these services.

Pareto-redistributive benefits, or donor benefits, generated by in-kind or money transfer programs, are a third category of externality. Of course, the donees also enjoy increased utility from such transfers. In fact until very recently nearly all benefit-incidence studies implicitly assumed that transfer programs generate benefits only for donees. In the wake of the growing interest in the grants economy and Pareto-optimal redistribution, however, there have been some attempts to integrate both donor and donee benefits into benefit-incidence analysis. [Greene, Neenan, and Scott (1974) and Smolensky, Schmundt, Plotnick, and Stiefl (forthcoming).] The distribution of donor benefits is a more difficult task than the distribution of benefits to donees, who are more easily identified and whose evaluation of the transfer is more easily quantified. To allocate donor benefits requires both the identification of the beneficiaries and the assignment of appropriate utilities to beneficiaries in different income classes. Some of the

principal problems encountered in measuring the utility enjoyed by
different groups are discussed in the next section. Problems associated
with evaluating in-kind transfers received by donees are reviewed in
section E.

D. Evaluation of Benefits

If we finesse the general equilibrium problem by assuming that
the total benefits generated by the government outlays equal the dollar
value of total expenditures and by defining the redistribution achieved
by the government fiscal activity to be the differential between an
estimation of a primary Lindahl distribution of income and the actual
distribution; if benefits from public services can be classified as
either direct (private or public benefits) or external (nonredistributive
or Pareto-redistributive benefits); then there remains this final
task in determining the benefit incidence: the estimation of the
dollar value of the utility received by citizens in different classes.
This final exercise, though of crucial importance, typically has not
been addressed in benefit-incidence studies.

In a competitive market a consumer maximizes utility by adjusting
the quantity of a commodity consumed, with the consequences that the
marginal evaluation of any commodity tends to equal its market price
and to be the same for all consumers. In the public sector, on the
other hand, a citizen is not free to adjust the quantity of public
service consumed. As a result of this constraint, citizens' marginal
evaluations of a particular public service will only by chance tend to
be the same. Since citizen evaluations cannot be directly inferred from

market values, some procedure for imputing benefits from public programs must be devised that is sensitive to the potential variation in citizens' marginal evaluations.

Aaron and McGuire (1970) have demonstrated that the imputation of benefits across income classes is indeed extremely sensitive to the values assigned to the marginal utility of income. Maital (1973) has argued in favor of specific values for the marginal utility of income to be used in the imputation of benefits. He proposes the following general functional form for the marginal utility of income:

$$MU(Y) = KY^{-\phi}$$

> where ϕ is the elasticity of marginal
> utility with respect to income as well
> as the inverse of the elasticity of
> substitution between goods.

Based on various estimates of the elasticity of substitution between goods, Maital has concluded that the value of ϕ is 1.5 for the United States. If marginal utility does indeed decline more than proportionately with income, as a value of 1.5 for ϕ would imply, then the dollar value of the utility received by upper-income classes from government expenditures will be appreciably increased and that received by lower-income classes correspondingly reduced compared with the benefits imputed under the assumption that the marginal utility of income is constant over all income classes.

The studies from which Maital derives his estimates of ϕ are all based on the assumption of additively separable utility functions. This assumption implies that categories of commodities neither complement nor substitute for one another. Even though we know that such is

literally not the case, it is difficult to say just how crucial this

assumption is for evaluating the benefits from public services. Private

and public education are substitute purveyors of education. Automobiles

and public parks can be complementary inputs for recreation, or they

can be substitute sources of recreation. Private agencies often perform

the same services as public welfare agencies, and private hospitals

quite frequently substitute for public facilities. Thus the marginal

evaluation of a public program may well depend on both the current

level of the public program itself and the existence and size of

private and other public programs. In the absence of any quantitative

investigation of this question, however, it is difficult to say how

important this consideration is.

In the illustrative figures provided in section III we assume that

the elasticity of marginal utility with respect to income is 1.0. This

is a lower estimate than Maital's 1.5 and may thus appear to be a

weaker assumption than his, at least in the sense that it is closer

to the assumption implicit in most previous benefit-incidence studies,

namely, that the elasticity of marginal utility of income is zero

across all income classes.[11]

E. Valuation of In-kind Transfer by Recipients

There have been several attempts to measure the dollar value of the

welfare shortfall from receiving transfers in kind, such as medical

care, food stamps, and housing, rather than equal-value money transfers.

Undoubtedly recipients value in-kind transfers at something less than

their cost, but Smolensky, Schmundt, Plotnick, and Stiefel (forthcoming)

conclude that in most instances it is valid to assume that this valuation is close to the dollar cost. In the numerical exercise presented in the next section, the dollar cost of in-kind transfers is assumed to equal the value of transfers to the donees.

III. Numerical Illustration

The implications of the discussion to this point will become more evident if we contrast estimates of redistribution based on the argument of this paper with estimates calculated in the traditional manner. For this illustration we will use state and local health and welfare programs in the Washington metropolitan area in 1970 [Greene, Neenan, and Scott (1974)]. In Table 1, estimates derived by procedures consistent with the procedures advocated in this paper are presented for the net redistribution among District of Columbia residents resulting from expenditures and taxes associated with health and welfare programs. In contrast, in Table 2 are presented simply the gross benefit-incidence estimates from health and welfare outlays, as derived by the methodology used in most other redistribution studies.

The estimates of redistribution in Table 1 are derived in the following manner:

1. The dollar value of the consumer, or use-of-income, utility by income class received by District of Columbia residents from 1970 metropolitan health and welfare expenditures is evaluated in terms of the marginal expenditure and assuming unitary elasticity of the marginal utility of income. (See sections IIB, IIC, and IID.)

Table 1

Net Redistribution Resulting from Health and Welfare Expenditures
and Related Taxation as a Percentage of Money Income,
District of Columbia, 1970

Income Class	(1) Health	(2) Welfare
below $3000	23.0	8.7
$3000-$3999	7.2	2.3
$4000-$5999	2.4	0.3
$6000-$7499	0.8	-0.1
$7500-$9999	0.9	-0.3
$10,000-$14,999	0.6	-0.3
$15,000-$24,999	0.4	-0.3
$25,000 and above	0.8	-0.1

Source: Computed from data presented in Greene, Neenan, and Scott
(1974).

Table 2

Benefits from Health and Welfare Expenditures, Measured by
Cost of Service, as a Percentage of Money Income,
District of Columbia, 1970

Income Class	(1) Health	(2) Welfare
below $3000	25.7	33.6
$3000-$3999	9.0	11.0
$4000-$5999	5.3	3.4
$6000-$7499	3.6	1.6
$7500-$9999	2.8	0.6
$10,000-$14,999	1.6	0.2
$15,000-$24,999	0.8	0.1
$25,000 and above	0.4	0.1

Source: Greene, Neenan, and Scott (1974), pp. 86 and 92.

2. The difference between these consumer benefits and the estimated state and local taxes paid by District of Columbia residents in support of the health and welfare functions constitute the first component of redistribution. (See section IIA.)

3. The second component of redistribution is the estimated dollar value to donees of the health and welfare in-kind and money transfers, with in-kind transfers valued at their full dollar cost. (See section IIE.)

4. The sum of these two elements of redistribution constitutes an approximation to the differential measure of redistribution suggested by the Behrens-Smolensky analysis. The dollar value of the net redistribution resulting from the health and welfare expenditures and the taxes employed to finance these expenditures is expressed as a percentage of money income for eight income classes in Table 1, columns 1 and 2.

The benefit-incidence estimates shown in Table 2 are based on the procedures employed by nearly all benefit-incidence studies. (See section IIC.) Two steps are involved in this estimation of benefit incidence:

1. An imputation is made to each income class of the dollar value of the costs of services and transfers received by individuals in that class. These estimates represent the total benefits, measured by their costs, generated by health and welfare outlays.

2. These gross benefits, with no offsetting allowance for taxes paid, are expressed as a percentage of money income for eight income classes in Table 2, columns 1 and 2.

Summary observations may be made regarding these two illustrative

estimates of fiscal incidence. First, the redistribution indicated

in Table 1 is net of utility from expenditures and disutility from

taxes, and thus it provides an index of real income redistribution. The

estimates also allow for Pareto-redistributive, interdependent utility

relationships. The benefit estimates shown in Table 2, on the other

hand, take no account of taxes paid to finance the health and welfare

services, express the value of the expenditures merely in terms of

the dollar cost of the service supplied, and allow for no externalities.

Second, the redistribution estimated in Table 1 is a differential

measure that contrasts a primary, hypothetical with-government income

distribution with the actual distribution and thus makes some theo-

retical allowance for general equilibrium adjustments. In Table 2,

however, it is implied that income is increased through health and

welfare outlays in comparison with a hypothetical no-government situa-

tion. In other words, no explicit allowance is made for general

equilibrium adjustments.

The cost-of-service estimates of benefits less local taxes

employed to finance the health and welfare programs (that is, the fiscal

residuals) are expressed as a percentage of money income and exhibited

in Table 3. Such residuals are similar in concept to those estimated

in most incidence studies [see Gillespie (1965), Tax Foundation (1967),

and Musgrave, Case, and Leonard (1974)]. Thus by comparing the distri-

bution patterns in Tables 1 and 3 we can see the practical import of the

two procedures. In contrast with the distribution profile shown in

Table 1, the income changes reported in Table 3 suggest both a

Table 3

Net Fiscal Residuals from Health and Welfare Programs, Estimated
by Cost-of-Service Methodology, as a Percentage of Money
Income, District of Columbia, 1970

Income Class	(1) Health	(2) Welfare
below $3000	23.0	31.2
$3000-$3999	7.2	9.7
$4000-$5999	3.7	2.3
$6000-$7499	2.0	0.1
$7500-$9999	1.3	-0.6
$10,000-$14,999	0.1	-0.8
$15,000-$24,999	-0.1	-0.7
$25,000 and above	-0.1	-0.6

Source: Computed from data in Greene, Neenan, and Scott (1974).

Table 4

Estimated Percentage Changes in Real Income Due to Net
Incidence of Health and Welfare Programs, District
of Columbia, 1970, and Differences Between Estimates

Income Class	Change in Real Income Due to Net Health and Welfare Programs (1) Preferred Procedure	(2) Cost-of-Service	(3) Difference Between Columns 1 and 2
below $3000	31.7	54.2	-22.5
$3000-$3999	9.5	16.9	-7.4
$4000-$5999	2.7	6.0	-3.3
$6000-$7499	0.7	2.1	-1.4
$7500-$9999	0.6	0.5	+0.1
$10,000-$14,999	0.3	-0.7	+1.0
$15,000-$24,999	0.1	-0.8	+0.9
$25,000 and over	0.7	-0.7	+1.4

Source: Tables 1 and 3.

significantly greater welfare gain for the lower-income classes and
a much inferior welfare position for the higher-income classes as a
consequence of local health and welfare outlays.

The implication of choosing one or the other methodology for esti-
mating income redistribution through local public fiscal activity can
be seen more clearly in Table 4. The net redistributional impact of
both the health and welfare programs estimated (1) by the procedures
suggested in this paper and (2) by the traditional procedures are
presented in Table 4, columns 1 and 2, respectively. Thus the net
impact of the health and welfare functions, whose expenditures
accounted for approximately 25 percent of the District of Columbia
budget outlays in 1970, is estimated to increase the income of the
lowest-income class by 54.2 percent under the cost-of-service pro-
cedures but only 31.7 percent according to the methodology proposed
here. On the other hand, the highest-income class suffers an estimated
income loss of 0.7 percent under the cost-of-service procedures in
contrast with an estimated 0.7 percent increase under the proposed
procedures. The differences in the estimated change in income,
expressed as a percentage of money income, derived under the two
estimating procedures are arrayed in column 3. Again we see that the
preferred procedure estimates a relatively reduced welfare gain for
the lower-income classes. For the upper-income classes an increased
real income gain rather than a reduction in real income is reported as
a consequence of these largely redistributive programs.

IV. Summary and Directional Arrows

By inference the illustrative numbers presented in Table 4 draw
into question the magnitude of the redistribution through local govern-
ment fiscal activity that has been reported by most incidence studies.
Even though these estimates do indicate that real income for the
lowest-income classes indeed was increased by the two local government
programs, it was also estimated that the high-income classes experienced
an increase in real income from the programs that was equivalent in
absolute terms to that gained by the lower classes. Thus instead of
the massive redistribution from the high-income to low-income classes
through local fiscal activity reported by many incidence studies
(Proposition 1), it may be true that low-income classes indeed are
beneficiaries of this activity but that high-income classes also receive
from public-sector transfer programs an increase in real income that
is analogous in its source to the gains from trade that consumers receive
from market transactions (Proposition 2).

These findings coupled with survey data indicating that large
numbers of higher-income citizens favor redistributional efforts
(Proposition 6) might seem to indicate that current policy and citizen
attitudes undercut the prescription that redistributional policy should
be designed and administered at the federal level (Proposition 3). Is
not redistribution currently effected, and with public approbation,
at the local level? And if so, why is this situation improper? On
closer examination, however, Proposition 3 emerges as generally valid
even though in need of some nuancing. First, even if a redistributive

program of a specific jurisdiction within a metropolitan area does generate welfare gains for the higher-income residents, their evaluations of the redistributional program at the margin undoubtedly lie below their evaluations of marginal additions to programs generating direct benefits for them. In this case their level of welfare can be increased by moving out of the jurisdiction financing the redistributional programs to jurisdictions with more attractive public-sector packages. There is some evidence that intrametropolitan migration can be partially explained in terms of fiscal residuals [Bradford and Kelejian (1973)].

A second consideration that cautions against the local administration of redistributional programs is that even if the financial responsibility for locally administered redistributional programs is assumed by state and/or federal governments (Proposition 4), there is reason to believe that these programs cannot be maintained without inducing the emigration of higher-income residents who perceive that their public-sector wants are not being met (Proposition 5). It may be true that a local public sector may not be able simultaneously to mount programs that appeal to a wide spectrum of citizen wants. If a school system, for example, undertakes educational programs characterized as "redistributional," such as vocational training and compensatory programs, it may follow that programs appealing to higher-income classes, such as college preparatory curriculum, will be deemphasized. Thus even though redistributional programs may be financed by state and/or federal aid, and even though the higher-income citizens derive positive utility from them, it may still be true that the fiscal residuals of higher-income citizens will be lower than they would be in a homogeneous

suburban school district that catered exclusively to their direct educational wants. A recent empirical study of urban residential location offers some support for this contention [Orr (1975)]. But if this is so, how can any redistributional educational program, which of its nature must be local, be undertaken without inducing emigration of those who also desire different outcomes from education? Does this mean that redistributional efforts, even if financed by higher-level governments, must be attended by citizens "voting with their feet?"

Lancastrian consumer theory may be a good framework within which to analyze such questions concerning local public services [Lancaster (1966)]. A citizen's utility may be more accurately described as a function of the characteristics associated with local government activities than as a function of the traditional categories of local government expenditures, "education," "health," "general government," and so forth. Citizens do not have a demand for "education" simply but rather for such characteristics of the activities associated with educational inputs as, for example, (1) vocationally-oriented instruction for their own children, and (2) for other children; (3) college preparatory training for their own children, and (4) for other children; (5) instruction that emphasizes the three Rs; and (6) instruction that takes place in a socially and economically integrated context. Price and income elasticities may more properly be understood in terms of these characteristics than in terms of the inputs and/or outputs generically described as "education." If the characteristics of the educational activity in a locality change, for example, as a consequence of shifting emphasis from college preparation and performance on

achievement tests for students with high measurable IQs to vocational

training and raising scores on achievement tests for those with lower

measurable IQs, Lancastrian analysis allows us to predict _ceteris_

paribus that there will be changes in the fiscal residuals of citizens

in that locality. And this will be true even if the level of expendi-

tures and taxes, the usual measures of fiscal residuals, remains

constant.

The redistribution through local public sector activities reported

in this and other studies is based on estimates of benefit and tax

incidence for a given year. In other words, these estimates are

based on short-run, impact measures of incidence with no attempt to

estimate benefit and tax incidence within a general equilibrium frame-

work. At least qualitative estimates of general equilibrium effects

must be allowed for lest we draw incorrect inferences from the

impact estimates. Even if we feel confident that we have an accurate

measure of redistribution from one year's fiscal activity, we have no

assurance that these effects will hold up across time if the expendi-

ture and tax policies employed in that year are maintained. If either

in- or out-migration is induced because of these policies, the impact

estimates may not be sustainable, and subsequent distributional patterns

may be quite other than intended. To mention just one possibility,

those residents who are most immobile, due to whatever reason—age,

transportation needs, discrimination in the housing and labor markets,

and so forth—may find that they are bearing the ultimate costs of an

earlier public policy designed to aid precisely their own income class.

These costs might occur in the form of (1) lower wages because work opportunities are reduced as business migrates and (2) lower values of property holdings due to reduced demand for property and the capitalized effects of increased tax burdens and altered expenditure patterns.

From the Arrow (1971) and Green and Sheshinski (1975) discussions we see that in a utilitarian model whether the social optimum, defined by the maximization of the sum of individual utilities, is attained by an input-progressive or an input-regressive distribution of public expenditures depends on assumptions made regarding the relation between individual utility and public expenditures. Such a range of indeterminacy is at least reduced by the results of this study, which indicate that an "input-progressive" distribution of health and welfare expenditures in the District of Columbia produces a welfare gain for both lower-income and upper-income classes. But the Arrow and the Green and Sheshinski analyses as well as the estimates produced here rest on the strong assumption that individuals' utilities derive from existing patterns of income, wealth, and talent. Implicitly, therefore, the status quo is invested with normative value. Consequently, before any judgment can be offered concerning the social optimality of public activities, this important question must be addressed. In the meantime, we should realize that the most we can infer from benefit- and tax-incidence studies are estimates of welfare changes at the margin.

Notes

[1]For Behrens and Smolensky the _final_ distribution of income is "the distribution of after-tax factor income plus transfers and benefits of all final government services. The benefits of general government services (which include any taxpayer benefits accruing from transfer programs) and recipient benefits of in-kind transfers are all valued at their marginal valuation to each individual as given by his demand curve for each service" (1974, p. 317). As we shall see, the question of determining the "marginal evaluation" is very troublesome.

[2]Reynolds and Smolensky (1974) attempt to skirt the acute form of the general equilibrium problem found in the approach employed by Gillespie (1965), the Tax Foundation (1967), and Musgrave, Case, and Leonard (1974). Reynolds and Smolensky compare the "relative distributions of income after taxes and expenditures in two years of a decade," (p. 21) rather than merely the prefisc and postfisc distributions in any one year. Indeed, this approach does resolve the major problems arising from attempting to compare the actual income with what it would have been in the absence of government. However, the validity of this strategy still depends on the strong assumption that all non-governmental influences on income distribution remain constant over the decade, since all measured changes in income distribution are attributed solely to the fisc.

[3]The primary distribution to be used for computing the counter-factual is to be determined as follows. (1) The dollar value of total nontransfer and donor benefits is assumed to equal total expenditures. (2) Total nontransfer and donor benefits, evaluated in terms of their marginal unit, are estimated for the various income classes. (3) The difference between the sum of the nontransfer and donor benefits and the taxes actually paid constitutes the first component of redistribution. (4) The second component of redistribution is the recipient benefit of Pareto transfers, also distributed by income class. It is assumed that factor incomes are the same for both the primary and the final distributions. This is weaker than the assumption employed in many incidence studies that factor incomes are the same for both the no-government and the with-government cases.

[4]For a discussion of the question of the variation in the value of benefits received by various groups, see Greene, Neenan, and Scott (1974), Chapter 3, and section D of this paper.

[5]Thus Samuelson first defined a public good as one "which all enjoy in common in the sense that each individual's consumption of such a good leads to no subtraction from any other individual's consumption of that good" (1954, p. 387). This definition, if interpreted narrowly, would seem to preclude a commodity from the public good category if there were rivalry in its consumption even if it generated external benefits or Pareto redistribution. However, Samuelson's later definition of a public good as "one that enters two or more persons' utility" (1969, p. 108) logically encompasses within its domain not only commodities with some nonrivalry in their consumption but also those that generate external benefits and Pareto redistribution.

[6]For seminal theoretical discussions of the question of congestion costs, see Buchanan (1965) and Ellickson (1973).

[7]Local education, higher education, highways, health-hospitals, police-fire, sewers-sanitation, and parks-recreation.

[8]Thus in 1960 the percentage of primary and secondary education students enrolled in public schools ranged from over 97 percent in Arkansas to between 65 and 75 percent in New York, New Jersey, Pennsylvania, Illinois, and Wisconsin.

[9]Borcherding and Deacon's capturability parameter is the ratio of the estimators of two other parameters, the log of population (θ) and a "price elasticity" measure (η), which are both right-hand variables in the regressions. Total expenditures for the various categories are the left-hand variables. The capturability parameter is estimated by using the estimators of these two parameters where

$\alpha = 1 + \dfrac{\theta}{\eta+1}$. It should be noted that for most functional categories

either or both the estimated coefficients of θ and η do not significantly differ from zero.

[10]Bergstrom and Goodman (1973) have estimated demand functions for local government expenditures from a sample of 826 municipalities in 10 states that had 10,000 to 150,000 population in 1960. They have estimated values of a "crowding" variable that is similar to the Borcherding-Deacon "capturability parameter." Bergstrom and Goodman find that the "'crowding' variable generally has a value of one or greater..." (p. 293). "One could interpret this to mean that as the size of municipalities increases, the advantages of sharing the cost of public services among more persons, are countervailed by the cost of sharing the services among more persons" (p. 293). Bergstrom and Goodman ask "why, if there are not increasing returns in the municipal provision of the goods and services which we study, is their provision in the

public domain?" (p. 293). A possible answer to this query is offered by the discussion above that identifies two sources of publicness other than nonrivalry in consumption.

[11]For further discussion of this point and some argument in favor of choosing one for the value of the elasticity of marginal utility with respect to income, see Greene, Neenan, and Scott, pp. 47-48.

References

Aaron, Henry, and Martin C. McGuire, "Public Goods and Income Distribution," *Econometrica* 38 (1970): 907-920.

Albin, P.S., "Distributional Effects of State and Local Finance: A Skeptical View," *Land Economics* (February 1972): 86-87.

Arrow, Kenneth J., "Equality in Public Expenditure," *Quarterly Journal of Economics* 85 (August 1971): 409-415.

Behrens, Jean, and Eugene Smolensky, "Alternative Definitions of Income Redistribution," *Public Finance* (1974): 315-332.

Bergstrom, Theodore C., and Robert P. Goodman, "Private Demands for Public Goods," *American Economic Review* 63 (June 1973): 280-296.

Borcherding, Thomas E., and Robert T. Deacon, "The Demand for the Services of Non-Federal Governments," *American Economic Review* 63 (December 1972): 891-901.

Boulding, Kenneth, *Love and Fear* (Belmont, Cal.: Wadsworth, 1973).

Bradford, David F., and Harry H. Kekejian, "An Econometric Model of the Flight to the Suburbs," *Journal of Political Economy* 81 (1973): 566-589.

Buchanan, James M., "An Economic Theory of Clubs," *Economica* 32 (February 1965): 1-14.

Buchanan, James M., "Principles of Urban Fiscal Strategy," *Public Choice* 11 (Fall 1971): 1-16.

Ellickson, Bryan, "A Generalization of the Pure Theory of Public Goods," *American Economic Review* 63 (June 1973): 417-432.

Getz, Malcolm, "A Model of the Impact of Transportation Investment on Land Rents," *Journal of Public Economics* 4 (February 1975): 57-74.

Gillespie, W. Irwin, "Effects of Public Expenditures on Distribution of Income," in *Essays in Fiscal Federalism*, ed. R.A. Musgrave (Washington: The Brookings Institution, 1965).

Green, Jerry R., and Eytan Sheshinski, "A Note on the Progressivity of Optimal Public Expenditures," *Quarterly Journal of Economics* 89 (February 1975): 138-144.

Greene, Kenneth, William Neenan, and Claudia Scott, *Fiscal Interactions in a Metropolitan Area* (Lexington, Mass.: D. C. Heath, 1974).

Lancaster, Kelvin J., "A New Approach to Consumer Theory," _Journal of Political Economy_ 74 (February 1966): 132-157.

Maital, Schlomo, "Public Goods and Income Distribution: Some Further Results," _Econometrica_ 41 (1973): 561-568.

Musgrave, R. A., K. E. Case, and H. Leonard, "The Distribution of Fiscal Burdens and Benefits," _Public Finance Quarterly_ (July 1974): 259-311.

National Educational Finance Project, Roe L. Johns, Director, _Alternative Programs for Financing Education_ (Gainsville, 1971).

Orr, Larry L., _Income, Employment, and Urban Residential Choice_ (New York: Academic Press, 1975).

Prest, Alan, "Statistical Calculations of Tax Burdens," _Economica_ 22 (August 1955): 234-245.

Prest, Alan, "The Budget and Interpersonal Distribution," _Public Finance_ (1971): 80-98.

Reynolds, Morgan, and Eugene Smolensky, "The Post Fisc Distribution: 1961 and 1970 Compared," Institute for Research on Poverty Discussion Paper 191-74 (Madison: University of Wisconsin, 1974).

Samuelson, Paul A., "Pure Theory of Public Expenditure and Taxation" in _Public Economics_, ed. Julius Margolis and Henri Guitton (London: Macmillan, 1969).

Samuelson, Paul A., "The Pure Theory of Public Expenditure," _Review of Economics and Statistics_ 36 (November 1954): 387-389.

Smolensky, Eugene, Maria Schmundt, Robert Plotnick, and Leanna Stiefel, "Adding In-kind Transfers to the Personal Income and Outlay Accounts: Implications for the Size Distribution of Income " (New York: National Bureau of Economic Research, forthcoming).

Stigler, George, "The Tenable Range of Local Government," in _Federal Expenditure Policy for Economic Growth and Stability_ (U.S. Congress, Joint Economic Committee, 1957), pp. 213-219.

Tax Foundation, _Tax Burdens and Benefits of Government Expenditures by Income Class, 1961 and 1965_ (New York, 1967).

Watts, William, and Lloyd A. Free, eds., _State of the Nation_ (New York: Universe Books, 1973).