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ADDING IN-KIND TRANSFERS TO THE PERSONAL INCOME AND OUTLAY
ACCOUNT: IMPLICATIONS FOR THE SIZE DISTRIBUTION OF INCOME

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Account:  Implications for the Size Distribution of Income*

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ABSTRACT

We urge that the official U.S. government Personal Income and Outlay account be altered to record all government in-kind transfers to clearly identifiable beneficiaries. These transfers should be valued at their cost to taxpayers since we find that to be a suitable approximation to the value put on such transfers by recipients. The process of making the transfer should be viewed as an activity with a final output to be accounted for.

When these suggestions are implemented, it appears that redistribution through in-kind transfers consists of shuffling a great mass of money and resources about, mainly in the dense middle of the distribution. The poor gain some in the process, but not enough to have any substantial impact on overall measures of income inequality. That is not likely to change unless we get annual statistics to remind us that this is the case.

INTRODUCTION

Academic economists find, periodically, that the most pressing question
they wish to answer is different from what it was just a little earlier.  Each
change in fashion inevitably results in a call to broaden or alter the National
Income Accounts.  Currently the U.S. Accounts primarily reflect the question:
"Will aggregate demand be sufficient to fully employ labor?"  Recently,
Christensen and Jorgenson, as well as Nancy and Richard Ruggles, and John
Kendrick, have tried to shift the emphasis to aggregate supply in response to
the question:  "How can the long-term growth rate be raised?"  In the Christensen
and Jorgenson variant, appropriately accounting for the functional distribution
of income emerges as a key complementary issue.  More recently the question
has been, "What can be done to raise social welfare?", with a key complementary
issue being appropriately accounting for the size distribution of personal
income.  The most recent question heightens, even more than the growth question,
the ever-present tension between national income as an index of wealth versus
national income as an index of welfare.  [Nordhaus and Tobin.]

This paper is in the latest fashion.  It is concerned with one important
issue in appropriately accounting for the size distribution of income--the
treatment of in-kind transfers.  Hesitantly, and with great diffidence, it puts
welfare before wealth, and the size distribution before the functional distri-
bution.  Opening the accounts to welfare concepts is full of familiar complica-
tions.  For example, measuring the benefits of in-kind transfers appears to
require recourse to a utility function.

The paper is in two major parts.  First, we offer a rationale and an
illustrative set of T accounts with which to account for in-kind transfers.

In the accounts, benefits are attributed both to direct recipients and to taxpayers. Second, we offer an illustrative set of numbers to show that appropriately accounting for in-kind transfers alters our view of the size distribution of income and affects aggregate measures of inequality. In-kind transfers in this paper refer only to those quantitatively large government programs which subsidize quite specific goods or services to potentially identifiable people.[1] Even this thoroughly expedient definition of in-kind transfers poses thorny theoretical issues. One fundamental question is "Should the benefits of in-kind transfers to recipients be valued at their cost to taxpayers?" A simulation experiment suggests a surprising response. Conclusions on the desirability of expanding the number of subsidiary tables of the Personal Income and Outlay Account to account more satisfactorily for in-kind transfers are then drawn.

## I. ACCOUNTING FOR IN-KIND TRANSFERS

We will be primarily concerned with the Personal Income and Outlay Account. Personal income is household income, where households are defined to include non-incorporated business, non-existent businesses (to take account of imputed rental income), non-profit institutions, and private trust and pension funds so that charity flows can be conveniently netted out of the Commerce Department workload unless they pass through corporations or the government. Current procedures include cash transfers and the food stamp subsidy in personal income, but most of what we will call in-kind transfers appear only as purchases in Table 3.10 (Government Expenditures by Type of Function).

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[1] Since there is little reason to believe that taxes are on a marginal benefit basis, all government expenditures can be thought of as having a transfer component. In another paper Reynolds and Smolensky have distributed all government expenditures and taxes by income size class. In that paper, however, in-kind transfers are treated in the traditional way. It would also have been consistent to enter in-kind taxes (imprisonment, compulsory school attendance, jury duty, military conscription), but no attempt was made to do so.

We will consider here three modifications in the current procedure. The first is by now no longer controversial and we mention it merely in passing. We accept the suggestion of Nancy and Richard Ruggles and Kendrick that government capital formation and capital consumption be included in the accounts a separate items. This is important for us, because it would raise the dollar value of in-kind transfers. Indeed, for programs like public housing, in which the transfer consists largely of not charging tenants for the cost of capital consumption, nothing else makes sense.

Our second suggestion is to include in-kind transfers to direct beneficiaries in Personal Income and to value them at the minimum cash payment the recipients would accept to forego those in-kind transfers. (Call this "recipient benefits."). The final modification we propose is to recognize that in-kind transfers benefit the givers and to assign that benefit to taxpayers. (Call this "taxpayer benefits.") These modifications are proposed both to get the totals correct, and redress a bias in the related size distribution.

The modifications of the accounts proposed in this paper (beyond the inclusion of government capital consumption allowances) apply only to the Personal Income Accounts. The Income and Product and the Government Accounts are left unchanged to permit the continued provision of data for aggregate employment demand models.

Rationale for the Suggested Modifications

Enlarging the concept of income to include in-kind transfers is a short extension of existing practice. The most basic plausible definitions of income

and output--the dollar value of market output and the value of money income received by factor owners--have proved unsuitable even for narrow purposes. Accordingly, we already add selectively from nonmarketed private production. We also add money transfer payments which gives us both a better measure of aggregate demand and a measure closer to welfare. We go even further and add transfers of vouchers for goods, in particular food stamps. Having added cash and vouchers, why not add commodities? Business in-kind transfers are probably too small to be worth the effort.[2] Government may pose the opposite problem since at the limit all expenditures as well as taxes may be transfers. Still a substantial proportion of in-kind transfers of goods and services goes to specific recipients. It certainly seems desirable to extend the concept of personal income to encompass these changes for the same reasons that cash transfers are accounted for.

Our proposed modifications, which would account for in-kind transfers at their cash equivalent values and would account for taxpayer benefits are, however, not simple extensions of current practice. If adopted, they will establish an unwelcome precedence for evaluating private goods at their cash equivalent value, ex post. Yet, if we are to have a meaningful measure of the size distribution for issues of vertical equity, or if we are to bring philanthropy, public and private, into positive economics, or even if we are to obtain sensible Engel's curves for the lower end of the income distribution, we cannot logically proceed in any other way.

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[2]Lampman has, however, asked why receipts of insurance benefits, which he considers to be a transfer, as well as inter-household transfers are not accounted for.

Conceptual Issues

Our procedure requires that we measure the cash value of in-kind trans-
fers to recipients. A simple extension of current practice would equate
recipient benefits to taxpayer costs. However, most economists expect reci-
pient benefits to be less than taxpayer cost.[3] To the extent this expectation
is realized, following current practice would bias the distribution. Thus,
we propose to measure the recipient's valuation of in-kind programs as the
minimum cash transfer ($\Delta Y$) which would be necessary to get the recipient to
the utility level achieved after receipt of the in-kind transfers.

The size of $\Delta Y$ depends upon the functional form and parameters of the
recipeint's utility function as well as the number of in-kind programs avail-
able to the recipient, the extent of the subsidies, and any possible consump-
tion restrictions associated with the relevant public program. A utility
function must be chosen to calculate $\Delta Y$, and hence an arbitrary element is
introduced.

An additional major problem associated with using the $\Delta Y$ valuation of
recipient benefits is that it is not consistent with the valuation of other
goods in the accounts. Current practice values intramarginal units at their
marginal benefits, unless the good is of an all-or-nothing kind, while $\Delta Y$
includes any consumer surplus.

Turning to taxpayer benefits, current practice regards expenditure on
transfers as a burden on taxpayers rather than a purchase which increases
their welfare. Because the tax system, as conventionally measured, is mildly

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[3]In theory, it should be noted, the cash equivalent which recipeints put
on their in-kind transfers may exceed, equal, or be less than their cost to
government [Schmundt, Stiefel and Smolensky].

progressive, treating taxes in this manner biases the size distribution of
disposable income toward equality. Our proposal attempts to redress this
presumed bias.

Theoretical support for considering taxpayer benefits is based on the
current literature on "Pareto Efficient Redistribution," which rationalizes
cash and in-kind transfers by postulating that taxpayer and recipient utility
functions are interdependent. Indeed, the literature assumes that the donors
rationally maximize their own welfare by making transfers, cash and in-kind,
until the marginal cost of a transfer payment equals the marginal benefit of
the payment [Hochman and Rodgers; von Furstenberg and Mueller]. If we accept
the assumption of rational maximizing behavior on the part of donors, the
accounting framework must assume that transfers make neither the taxpayer nor
the recipient worse off. It follows not only that taxpayer benefits must be
measured, but also that total benefits to taxpayers must be at least equal to
total cost.[4]

Having admitted the existence of benefits to taxpayers, their value must
be calculated. We will make the strong lower bound assumption that for each
in-kind program total benefits to taxpayers equal the total cost to taxpayers.
That is, we assume total (as opposed to marginal) benefit taxation. This
assumption implies that if recipients benefit at all, the total benefits of the
program to recipients and to taxpayers exceed the total costs in the aggregate
(but not necessarily at the margin).

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[4]Since recipient benefits are expected to be less than taxpayer costs,
it may appear reasonable to value taxpayer benefits as the difference between
taxpayer costs and recipients benefits. The above discussion makes it clear,
however, that this method is inappropriate.

The Modified Personal Income and Outlay Accounts

The proposed treatment of in-kind transfer programs in the Personal

Income and Outlay Account is presented in this section using Medicaid

and public housing as examples. The accounting procedure for cash trans-

fers is presented first to establish a norm for comparison. The cash

transfer entries entail only one modification, on the outlay side of the

account. The in-kind transfers entries will modify both the outlay and the

income sides of the accounts.[5]

Cash Transfers. Assume that the government provides 30 of cash trans-

fers in a given year, earned income is 100, the only government activity

is the transfer program, and all disposable income is consumed. The Personal

Income and Outlay Account would presently appear as follows:

Exhibit I

| Outlay | | Income | |
|---|---|---|---|
| Personal Consumption Expenditures | 100 | Earned Income | 100 |
| Personal Tax Payments | 30 | Government Transfers to Persons | 30 |

These entries correctly value the cash transfer to the recipient, but

ignore the value of the payment to the taxpayers.[6] To represent taxpayer

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[5]Schmundt, Smolensky and Stiefel, have shown that correctly measuring
recipient benefits from in-kind programs ($\Delta Y$) requires simultaneously evaluating
all in-kind benefits received by the recipient. For expository purposes only,
the in-kind programs are treated separately.

[6]We assume that there is no "stigma" or other effects associated with cash
transfers which would cause the recipient to value the transfer at less than the
dollar amount.

benefits, we propose the following entries modifying what now appears on the Outlay side in the following way:

Exhibit II

| Outlay | | Income | |
|---|---|---|---|
| Personal Consumption Expenditures | 100 | Earned Income | 100 |
| Personal Tax Payments | 30 | Government Transfers to Persons | 30 |
| | | | |
| Personal Consumption of Redistribution | 30 | | |
| Personal Tax Reduction due to Gov't Purchase of Redistribution | -30 | | |

On the outlay side, we treat the 30 just like any consumption purchase in the private market but the government is the intermediator, funnelling the tax outlay into consumption of redistribution for the taxpayer.[7] To indicate the taxpayers' consumption benefits, we enter 30 under consumption outlays and correspondingly reduce the tax outlay. Having started from the published accounts rather than de novo, taxes must be reduced to offset the 30 added to consumption outlays.[8] The new entry also emphasizes the underlying conceptual change. Instead of a burden, the transfer is identified as a welfare increasing purchase.

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[7] A more complete specification would treat the government's costs in effecting that transfer as "value added by government." That cost appears in both the current and modified accounts in "Government Purchases."

[8] If we had started de novo, the two offsetting tax entries would not have appeared.

Our modification suggests that two different size distributions be calculated. The income side would be distributed by income class according to "Earned Income" and "Government Transfers to Persons" in the usual way. The outlay side would normally have the same distribution. In our accounts the outlay side is distributed according to the two categories "Personal Consumption Expenditures" and "Personal Consumption of Redistribution." To the extent that "Personal Consumption of Redistribution" is distributed differently than "Personal Tax Payments" the distribution of our Outlays will differ from the distribution of Income. The two distributions would provide an upper and lower measure of income inequality. Since we expect that taxpayer benefits are more unequally distributed than taxes, the outlay side will be more unequally distributed.

In-Kind Transfers Directly Financed. In this section we describe the procedures to be used for all directly financed in-kind transfers. To simplify the exposition, assume earned income is 100, all disposable income is consumed, and the only government activities are an expenditure of 10 for a pure public good and a transfer program that provides at no charge 30 units of medical services. Suppose $\Delta Y$ is the cash equivalent value placed on this in-kind transfer by recipients.

Current accounting for the Personal Income and Outlay Account in this situation is as follows:

Exhibit III

| Outlay | | Income | |
|---|---|---|---|
| Personal Consumption Expenditures | 60 | Earned Income | 100 |
| Personal Tax Payments | 40 | | |

The consumption of 30 units of subsidized medical care does not appear in these accounts, but would be found in the Government accounts as a government purchase.

Our proposal would recognize explicitly that this form of medical care is an in-kind type of income and consumption. The recipient cash equivalent, $\Delta Y$, would be added to personal income as "Recipient Benefits from In-Kind Transfers" and to personal outlays as "Personal (In-Kind) Consumption Expenditures." As with cash transfers, we would further consider the 30 of Personal Tax Payments which financed the transfer to be a consumption purchase of redistribution services. Hence, our accounts would appear as:

### Exhibit IV

| Outlay | | Income | |
|---|---|---|---|
| Personal Consumption Expenditures | $60+\Delta Y$ | Earned Income | 100 |
| Personal Tax Payments | 10 | Recipients Benefits from In-Kind Transfers | $\Delta Y$ |
| Consumption of Redistribution | 30 | | |

The proposed accounting procedure requires slight modification for food stamps, which presently are included in personal income and outlay but at the cost to taxpayer and with no attribution of donor benefits.[9] On the income side, food stamps appear in "Government Transfers to Persons." It is therefore necessary to reduce this entry by the taxpayer cost and add in our new account, "Recipient Benefits...," their cash equivalent value.

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[9] In recent years the cost to the government of the food stamp program can be found primarily in line 27, other health, labor and welfare, and the column federal transfer payments and "net interest paid," of Table 3.10, "Government Expenditures By Type of Function," in the July issue of the Survey of Current Business and hence in the various other displays related to government.

On the outlay side consumption must be adjusted to allow for the fact, made so explicit on the income side, that recipients may not value their increased food consumption at market prices. Furthermore, "Personal Tax Payments" need be lowered and "Consumption of Redistribution" increased by an equal amount.

In-Kind Transfers Indirectly Financed. The treatment of public housing in the accounts must differ from the preceding because the subsidy is not financed directly from tax outlays. The subsidy arises because rental income is not sufficient to amortize capital costs. The taxpayer cost is an opportunity cost rather than a direct tax outlay. The accounts as presently constructed ignore entirely the subsidized recipient benefit and the taxpayer cost because government capital consumption is not included.

Our proposed modifications require the prior assumption that the accounts have been changed to include government capital consumption and then entail further changes. We include the Income and Product and the Government Accounts to clarify the capital consumption problems.

It will facilitate the exposition of the accounting framework to use some numbers. Assume:

The gross rent (assumed equal to resource cost) which a public

    housing unit would obtain in the private market............... 74

Maintenance costs of a public housing unit....................... 42

Rental value of public housing capital

    (depreciation + interest)..................................... 32

Rent charged tenants.................................................. 44

Market value of subsidy to tenant.................................. 30

The following is presumed to be the current accounting practice for the rental of public housing units in the Income and Product Accounts.

Exhibit V A

| Product | | Income | |
|---|---|---|---|
| Personal Consumption Expenditures | 44 | Earned Income | 42 |
| | | Current Surplus of Government Enterprises less Subsidies | 2 |

The Government Receipts and Expenditure Account is presumably the following:

Exhibit V B

| Expenditures | | Receipts | |
|---|---|---|---|
| Purchases | 42 | Personal Tax & Nontax Payments | 44 |
| Current Surplus, etc. | 2 | Nontax Payments | 44 |
| | | Tax Payments | 0 |

The entries appearing in the Personal Income and Outlay Account would be:

Exhibit V C

| Outlay | | Income | |
|---|---|---|---|
| Personal Consumption Expenditures | 44 | Earned Income | 42 |
| | | Current Surplus of Government Enterprises less Subsidies | 2 |

A specific method for entering government capital consumption into the accounts has been proposed. [Nancy and Richard Ruggles.] This method increases total outlays and income in the Product and Government accounts, but leaves the Personal Accounts unchanged as in the following:

Exhibit VI A

| Product | | Income | |
|---|---|---|---|
| Personal Consumption Expenditures | 44 | Earned Income | 42 |
| Imputed Services of Durables | 30 | Current Surplus of Gov't Enterprises less Subsidies | 2 |
| | | Capital Consumption | 30 |

Notice that GNP is increased by 30. On the income side of the account an addition of 30 in capital consumption is included; on the product side there appears a new item, imputed services of durables, which probably ought to go into the government account.

The Government Receipts and Expenditures Account would then look as follows:

Exhibit VI B

| Expenditures Outlays | | Receipts Income | |
|---|---|---|---|
| Purchases | 42 | Personal Tax and Nontax Payments | 44 |
| Imputed Services of Durables | 30 | Imputed Income from Durables | 30 |
| Government Surplus on Income and Product Account | 2 | | |

Again the Accounts are increased by 30 of imputed income on the income side and imputed services on the outlay side.

The following entries would appear in the Personal Income and Outlay Account:

Exhibit VI C

| Outlay | | Income | |
|---|---|---|---|
| Personal Consumption Expenditures | 44 | Earned Income | 42 |
| | | Current Surplus of Government Enterprise less Subsidies | 2 |

Our proposals would go on to assign the benefits of public housing to taxpayers on the one hand and tenants on the other. The final table there-fore is:

Exhibit VI D

| Outlay | | Income | |
|---|---|---|---|
| Personal Consumption Expenditures | 44 | Earned Income | 42 |
| Imputed Services of Durables to Consumers | $\Delta Y$ | Current Surplus of Government Enterprises less Subsidies | 2 |
| Personal Consumption of Redistribution | 30 | Capital Consumption | 30 |
| | | Recipient Benefits from Capital Consumption | $\Delta Y$ |

The accounts for public housing differ from that of cash and voucher transfers because the subsidy is not financed directly out of taxes.[10] On

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[10]Indeed, the Public Housing Authorities run a surplus on current account.

the income side an implicit cash flow from capital consumption has been

added. It is this income which is transferred to tenants, and their

valuation of this benefit, $\Delta Y$, must also be recorded. On the outlay side

no adjustment is made to taxes paid. The imputed services of durables

are consumption expenditures assigned to tenants. The implicit transfer

of 30 is entered as "Personal Consumption of Redistribution."

All other indirectly finance in-kind transfers can be treated in this

way.

Summary and Conclusions on the Accounting Framework. Several principles

emerge from the proposed treatment of in-kind transfers which should prove

applicable when further modifications of the accounts are considered.

1. Capital consumption allowances are an important element of the

redistribution process and must be carefully accounted for.

2. The double-entry nature of the accounts serves as more than a

check on consistency when transfers are assumed to be Pareto efficient. The

size distributions based upon the two sides provide a lower and upper bound

to the degree of inequality in the distribution of income.

II. SOME ILLUSTRATIVE NUMBERS

Up to this point the paper has stressed that in-kind transfers should

be included in Personal Income, and a procedure for doing so was specified.

The remainder of this paper implements the accounting system and discusses three implications for the size distribution. We wish to show first that accounting for in-kind transfers reduces income inequality compared to the distribution of cash income. Second, since recipient benefits may be less than the cost to the government, this difference is measured and its implications discussed. Finally, a technique for measuring donor benefits from in-kind transfers is implemented and the results evaluated.

At the outset we simplify matters by setting benefits equal to costs to taxpayers. This assumption is then relaxed.

## Defining and Accounting for In-Kind Transfers

A reasonable definition of an in-kind transfer would be the difference between what the taxpayer would pay for a good or service in a Lindahl equilibrium and what he does pay. [Behrens and Smolensky.] Every program would probably then involve some transfer. In this paper only goods and services provided to clearly identifiable beneficiaries at other than marginal cost are called transfers. Even this approach implies a relatively broad view of what constitutes in-kind transfers. The programs that ordinarily are classed as in-kind transfers are included--food stamps, Medicaid and Medicare, public housing, etc. Such programs provide what we label as consumption in-kind benefits. Our definition also includes investment in-kind transfers. This category is comprised of direct expenditures on public education, subsidies and grants to students (e.g., GI Bill and manpower programs); in short, subsidized programs which principally increase the recipient's human capital. The distinction between consumption and investment transfers is not always clearcut;

TABLE 1

MAJOR IN-KIND TRANSFER PROGRAMS, 1970

(Millions of dollars)

| Program | Federal Expenditures | State-Local Expenditures | All Government |
|---|---|---|---|
| Consumption Transfers | | | |
| Food Stamps[1] | $ 1,577 | | $ 1,577 |
| Commodity distribution[1] | 321 | | 321 |
| Child nutrition[2] | 703 | $ 185 | 888 |
| Public housing[3] | 368 | | 368 |
| Rent supplements[2] | 18 | | 18 |
| Medicare[4] | 5,255 | | 5,255 |
| Medicaid[5] | 2,548 | 2,260 | 4,808 |
| Veterans hospital and medical care[2] | 1,651 | | 1,651 |
| OEO Health and nutrition[2] | 123 | | 123 |
| Legal aid | 51 | | 51 |
| Subtotal | 12,615 | 2,445 | 15,060 |
| Investment Transfers | | | |
| Elementary, secondary and other education[6] | 1,214 | 42,934 | 44,148 |
| Higher Education[6] | 336 | 11,325 | 11,661 |
| Manpower programs | 1,149 | 98 | 1,247 |
| MDTA institutional[7] | 173 | | 173 |
| MDTA on-the-job[8] | 36 | | 36 |
| NYC in-school[7] | 41 | | 41 |
| NYC out-of-school[7] | 21 | | 21 |
| Operation Mainstream | 9 | | 9 |
| Concentrated Employment[7] | 82 | | 82 |
| JOBS[7] | 82 | | 82 |
| Job Corps[7] | 96 | | 96 |
| WIN[7] | 50 | | 50 |
| Vocational Rehab.[9] | 340 | 98 | 438 |
| Other manpower[7] | 219 | | 219 |
| Veterans education benefits[10] | 991 | | 991 |
| TOTAL IN-KIND TRANSFER EXPENDITURES | $16,305 | $56,802 | $73,107 |

NOTES TO TABLE 1

1. A. Skolnik and S. Dales, "Social Welfare Expenditures" unpublished tables of the Office of Research, Social Security Administration. Total includes administrative costs and is for FY 1971.

2. _Ibid._, excludes administrative costs, and is for FY 1970.

3. Estimated value of subsidy derived from Table 3.

4. Data from _Social Security Bulletin Annual Statistical Supplement_, 1970, table 117, row 2; net of SMI premium cost to recipients and adjusted slightly downward since the Current Population Survey (used to derive Table 3) counts less eligibles than did the Social Security Administration. Data is for calendar year 1970.*

5. Total expenditure data is for calendar year 1970 and is from _Number of Recipients and Amounts of Payments Under Medicaid, 1970_, HEW, Social and Rehabilitation Services publication number (SRS) 73-03153. Allocation between Federal and state-local governments is based on the average of the proportion of Medicaid expenditures found in Skolnik-Dales, for FY 1970 and 1971.*

6. Reynolds-Smolensky, appendix D, for FY 1970.

7. Data is for FY 1970 and is from _Special Analyses of the Budget_, 1972, p. 138.*†

8. Data is for FY 1970 but on obligations basis - _Manpower Report_, 1971, p. 299.*†

9. A. Skolnik and S. Dales, _op. cit._ *†

10. Administrator of Veterans Affairs, _1972 Annual Report_, p. 166.

*Excludes administrative costs.

†Expenditures adjusted to exclude estimated cash payments to participants.

health programs for example. Since we treat both types in identical ways in our analysis, the distinction is merely an expositional convenience.

In 1970 the federal government provided $16 billion in in-kind transfer benefits. State and local governments administered another $57 billion, mainly for education. The major in-kind programs (as we define them) and their costs are listed in Table 1. The dollar volume of in-kind transfers exceeded that of cash transfers, which totaled $63 billion in 1970.[11]

In what follows we restrict our attention to seven major in-kind transfer programs ($68.8 billion in 1970).[12] Implementing the proposed accounting system to record these expenditures produces the following accounts:

TABLE 2

PERSONAL INCOME AND OUTLAY, 1970
($ millions)

| Outlay | | Income | |
|---|---|---|---|
| Personal Consumption | | Earned Income | 647,607[1] |
| Personal Consumption of Cash Redistribution | 647,607[2] | Cash Transfers | |
| Personal Tax Payments | | | |
| Personal Savings | | | |
| Personal Consumption of In-Kind Redistribution | 68,845 | Recipient Benefits from Government In-Kind Transfers | 68,845 |
| | 716,452 | | 716,452 |

[1]CPS money income, as reported in Projector and Bretz, Table 5.
[2]Personal contributions for social insurance are not deducted on the income side and, consequently, are included on the outlay side.

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[11]A. Skolnik and S. Dales, Table 1, Social Security Bulletin December 1972.

[12]The seven programs are food stamps, public housing, Medicare, Medicaid, elementary-secondary-other public education, higher public education and manpower programs.

## The Distribution of In-Kind Income

We focus here on the right hand side of Table 2 and ask how the provision of $68.8 billion of in-kind transfers affected average household incomes and the degree of income inequality. Table 3 shows that in-kind transfers markedly increases the average incomes of all groups (col. 12) For the poorest group, the difference of $559 (col. 10) increases income by 215 percent.

There is a strong positive relationship between benefits and income. Regression indicates that a rise in cash income of 1% is, on average, associated with a .22% gain in in-kind transfer income. An exception in this pattern for the range $6-7999 results largely from decreased Medicaid benefits after $6000.

Consumption transfers, nevertheless, are distributed in a strongly pro-poor pattern (col. 5). Investment transfers, which account for 79% of all in-kind transfers, rise steadily with income (col. 9).

Although in-kind transfers are pro-rich, they are more evenly distributed than cash incomes. Hence, including them in personal income decreases the degree of "inequality." The Gini coefficient for cash income was .398; adding all in-kind benefits shifts it down to .371. Similarly, including in-kind transfers raises the share of income going to the four poorest income classes--the bottom 24 percent--from 5.2 percent to 6.5 percent. A third measure of inequality, the coefficient of variation, declines from .52 to .49 when income includes in-kind transfers.

TABLE 3

DISTRIBUTION OF AVERAGE HOUSEHOLD BENEFITS OF SELECTED IN-KIND TRANSFERS, 1970

| Income Class | Consumption Transfers | | | | | Investment Transfers | | | | All In-Kind Transfers | Average Cash Income[7] | In-Kind Transfers as a % of Cash Income |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| | Food Stamps[1] | Public Housing[2] | Medicare[3] | Medicaid[4] | Total | Elem, Sec and Other Education[5] | Higher Education[5] | Manpower Training[6] | Total | | | |
| 0-999 | 18 | 6 | 104 | 94 | 222 | 272 | 4 | 61 | 337 | 559 | 260 | 215.0 |
| 1-1,999 | 50 | 20 | 179 | 184 | 433 | 272 | 4 | 47 | 323 | 756 | 1,508 | 50.1 |
| 2-2,999 | 71 | 18 | 173 | 191 | 453 | 358 | 10 | 44 | 412 | 865 | 2,461 | 36.4 |
| 3-3,999 | 62 | 15 | 146 | 134 | 357 | 444 | 16 | 39 | 499 | 856 | 3,468 | 25.5 |
| 4-4,999 | 53 | 12 | 122 | 156 | 343 | 543 | 36 | 31 | 610 | 953 | 4,471 | 21.7 |
| 5-5,999 | 36 | 7 | 90 | 142 | 275 | 612 | 52 | 19 | 683 | 958 | 5,445 | 17.8 |
| 6-6,999 | 24 | 4 | 69 | 59 | 156 | 634 | 61 | 5 | 700 | 856 | 6,452 | 13.3 |
| 7-7,999 | 17 | 2 | 55 | 33 | 107 | 721 | 71 | 6 | 798 | 905 | 7,458 | 12.1 |
| 8-9,999 | 16 | -- | 46 | 26 | 88 | 807 | 96 | 3 | 906 | 994 | 8,920 | 11.2 |
| 10-14,999 | 3 | -- | 35 | 24 | 62 | 843 | 231 | -- | 1,074 | 1,136 | 12,120 | 9.4 |
| 15-24,999 | -- | -- | 37 | 11 | 48 | 795 | 367 | -- | 1,162 | 1,210 | 18,410 | 6.5 |
| 25,000+ | -- | -- | 50 | -- | 50 | 744 | 1,171 | -- | 1,915 | 1,965 | 35,755 | 5.5 |

NOTES TO TABLE 3

1. Assumes total food stamp subsidies equal $1577 million as shown in Table
   1. Relative distribution of benefits obtained from tabulations of the
   magnetic tape files of A Panel Survey of Income Dynamics, Institute
   for Social Research, Survey Research Center, Ann Arbor, Michigan, 1972.

2. Distribution among income classes of public housing tenants obtained from
   HUD Statistical Yearbook, 1970, tables 107, 112 and 148. Average subsidy
   based on Smolensky-Gomery    Table I-B, inflated to 1970 price level.

3. All eligible recipients are assumed to receive the same benefit, which
   was computed by dividing total payments (net of premium cost) by total
   number of Medicare enrollees. The distribution of enrollees was derived
   from the Current Population Reports, Series P-60, #80 "Money Income in 1970
   of Persons and Families", tables 17 and 22.

4. Table values are the sum of two separate distributions since Medicaid
   recipients are divided into two groups - those receiving public assistance
   and those not on public assistance but qualifying as "medically indigent."
   For the public assistance group the percentage distribution of eligible
   recipients among income classes was obtained from tabulations of the
   magnetic tape files of A Panel Survey of Income Dynamics, op. cit.
   Multiplying the percentage by total Medicaid payments gave the total
   benefits to an income class. Average household benefit for that class
   then equaled total class benefits divided by the total number of households
   in the class. For the "medically indigent" the same procedure was used,
   except that Medicaid eligibility was determined by comparing the household's
   income to the limits set by its state of residence. These limits were
   found in " Income and Resources Levels for Medically Needy in Title XIX
   Plans in Operation as of April 15, 1970," unpublished table of the
   Social Security Administration. Resource levels were not considered
   due to data limitations, but it is believed that no serious bias resulted.

5. Drawn from Reynolds-Smolensky    appendix D.

6. Includes all manpower programs listed in Table 2 except "Other." For all
   included programs except Vocational Rehabilitation, distribution of benefits
   based on tables F-5, 7, 10, 11, 12, 13, 14 of Manpower Report, 1971. For
   Vocational Rehabilitation, distribution of benefits based on table 4 of
   "Characteristics of Clients Rehabilitated in Fiscal Years 1967-71," HEW,
   Social and Rehabilitation Services, 1973.

7. Source is table 5 of "Measurement of Transfer Income in the CPS", by
   Dorothy Porjector and Judith Bretz for the Conference on Research in
   Income and Wealth of the National Bureau of Economic Research, October
   3-4, 1972, Pennsylvania State University.

The high level of aggregation and our use of averages obscures the fact that in any given income bracket, some households receive above average benefits by participating in many in-kind programs, while others with nearly equal cash incomes obtain few or no benefits. [Joint Economic Committee.] Though the degree of equity of some individual in-kind transfer programs has been studied, [Smolensky and Gomery, Feldstein], currently available data do not permit a study of this issue for the complete system of in-kind transfers. National data on program enrollment and benefits at the family level are needed but non-existent.

The data in Table 3 are meant to be illustrative of orders of magnitude only. No attempt has been made to adjust for known sources of bias (e.g., under-reporting of money income in the CPS), or for inconsistencies in reporting periods (some data are for the calendar, some for the fiscal year), etc. Often, distributing benefits by income class required heroic assumptions.

One slightly less obvious caveat to note about Table 3 is that it does not measure, even conceptually, the redistribution of income due to in-kind transfers. Measuring the redistribution of income due to the fisc, or any part of it, requires a quite different accounting framework. The essential element of this framework is a counterfacutal which recognizes the general equilibrium interdependence between the fisc and the distribution of earned income. What is important in Table 3 is that the sum of columns 10 and 11 represents a more complete distribution of personal income.

Finally, it should be noted that human capital investments are valued at their supply price. Two comments are in order on this procedure. Though the supply price may differ from the capitalized value of the associated future earnings stream, any such difference does not affect current income.

Second, the cash equivalent of the subsidy need not equal the supply price, since human capital investments are in-kind transfers.

## A Simulation Approach to Benefit Weights

It has been demonstrated that in-kind benefits when valued at taxpayer cost affect measured income inequality. In this section we determine if this conclusion would be altered by valuing in-kind transfers at their cash equivalence to recipients. Our procedure is to calculate a set of scalars (benefit weights) which convert taxpayers' costs to benefits as evaluated by the recipient. A range of benefit weights for a selected list of programs is obtained via simulation.

Five programs were selected for this simulation—food stamps, public housing, rent supplements, Medicare and Medicaid. We assume each recipient family participates in a package of in-kind transfer programs, and is enrolled in at most one housing and one medical program. A utility function, a budget constraint (Y) and maximizing behavior are assumed and the utility the family obtains is calculated. The cash income that the family would need if it were to enjoy the same level of utility but received no in-kind transfers, EY, is then computed. It is inferred that the bundle of in-kind benefits increased the family's welfare, measured in dollar terms, by EY-Y. The ratio of EY-Y to the taxpayer cost of providing this set of transfers is the benefit weight.

Specifying the Utility Function. A variant of the displaced CES utility function was used in this exercise.[13] Because the five in-kind programs we

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[13] Of all the possible functional forms for a utility function, this is one of the few that is empirically tractable and yields demand functions consistent with economic theory. [Goldberger] Recent work on consumer benefits from public housing lends empirical support to our choice. [Murray]

are concerned with involve only three commodities--food, housing and medical

insurance--the utility function has just four arguments, these three and

"other." Hence, we assume:

$$(1) \quad U = \sum_{j=1}^{4} b_j (x_j - g_j)^{\frac{\sigma-1}{\sigma}} \qquad \text{if } \sigma \neq 1.$$

$$(2) \quad U = \prod_{j=1}^{4} (x_j - g_j)^{c_j} \qquad \text{if } \sigma = 1$$

where

$x_j$ = quantity of good j consumed

$g_j$ = displacement parameter (minimum quantity consumed)

$b_j$, $c_j$ = parameters

$\sigma$ = elasticity of substitution.[14]

To proceed with the simulation, equations (1) and (2) must be given

empirical content, which in turn requires identifying the $c_j$, $g_j$, $b_j$ and $\sigma$.

To show that the $c_j$'s are the marginal propensities to consume, assume that

good 4 is "other," $g_4 = 0$, and quantity units are specified so that market

prices equal unity. Maximizing (2) with the constraint $Y = \Sigma x_j$ gives:

$$(3) \quad x_j = g_j + c_j (Y - \sum_{i=1}^{4} g_i) \qquad j = 1, 2, 3$$

The parameter values of the $c_j$, were chosen for the utility functions

of five prototype families, which differ by size and/or income, from the

expenditure data in the Survey of Consumer Expenditures, 1960-61.[15] The data

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[14] In equation (1) omitting the exponent $\frac{\sigma}{\sigma-1}$ simplifies calculations and does not affect the final results.

[15] This procedure assumes identical utility functions for all families of a given size and income, but allows them to vary across income classes and by family size.

themselves are observations of the money spent on $x_1 \ldots x_4$ by family size and income, and from them we computed crude estimates of $c_1 \ldots c_4$.

To determine the minimum consumption expenditures on each good ($g_j$) we solve the demand equations of (3) and obtain:

$$(4) \quad g_j = x_j - \frac{c_j}{c_4} x_4 \qquad\qquad j = 1, 2, 3.$$

To identify the $b_j$ maximize (1), and solve the demand equations for $g_j$ to obtain:

$$(4') \quad g_j = x_j - b_j^{\sigma} x_4.$$

Comparing 4' to 4 shows that $b_j = \left( \dfrac{c_j}{c_4} \right)^{\frac{1}{\sigma}}$. Only $\sigma$ remains to be identified. The simulations were run by successively assuming $\sigma = .5$, .75 and 1.

Maximizing Utility with the Transfer Programs. Substituting our choice of $\sigma$ and our parameters into (1) and (2) produces a specific utility function for each prototype family. Assigning a particular package of in-kind bene- fits to a family, we maximize its utility using this estimated function, subject to the budget constraint (5) which exists when in-kind transfers are received:

$$(5) \quad Y = \sum_{I} (1 - s_j)\, xp_j + \sum_{II} xp_j - \sum_{II} s_j\, xr_j + \sum_{III} (1 - s_j)\, xr_j.$$

.We are assuming units are chosen such that all prices are unity and:

$Y$ = family cash income;

$s_j$ = subsidy rate for good j which depends on the transfer program's features and may depend on Y;

$xp_j$ = total amount of good j consumed when family receives the assigned set of in-kind transfers;

$xr_j$ = quantity of good j <u>required</u> to be consumed if received as an in-kind transfer. This number is constant for each recipient and is determined by the government.

I, II, III = program categories which are defined next.

As indicated in equation (5), each commodity falls into one of three categories depending upon the way in which the rules of the program affect the budget constraint.

Goods in category I are either:

a) nonsubsidized ($s_j$ = 0) because the family does not participate in an in-kind program providing good j;

b) "other" goods, where no subsidy is ever available, or

c) subsidized at rate $s_j$ both on the margin and inframarginally. That is, there is no quantity restriction on the consumpton of this transfer (e.g., Medicare), or some maximum limit has been set by the administrators which is larger than the amount actually desired at the subsidized price.

Category II contains commodities for which the subsidy ceases at quantity $xr_j$ and the recipient must purchase at least $xr_j$, but is free to supplement this level of consumption at market prices without losing the subsidy <u>and does</u>

Figure 1

BUDGET CONSTRAINTS FOR SUBSIDIZED COMMODITIES



Income

A

slope= -(1-s_j)

B

slope = -1

0        xr_j              C          D

Quantity Consumed
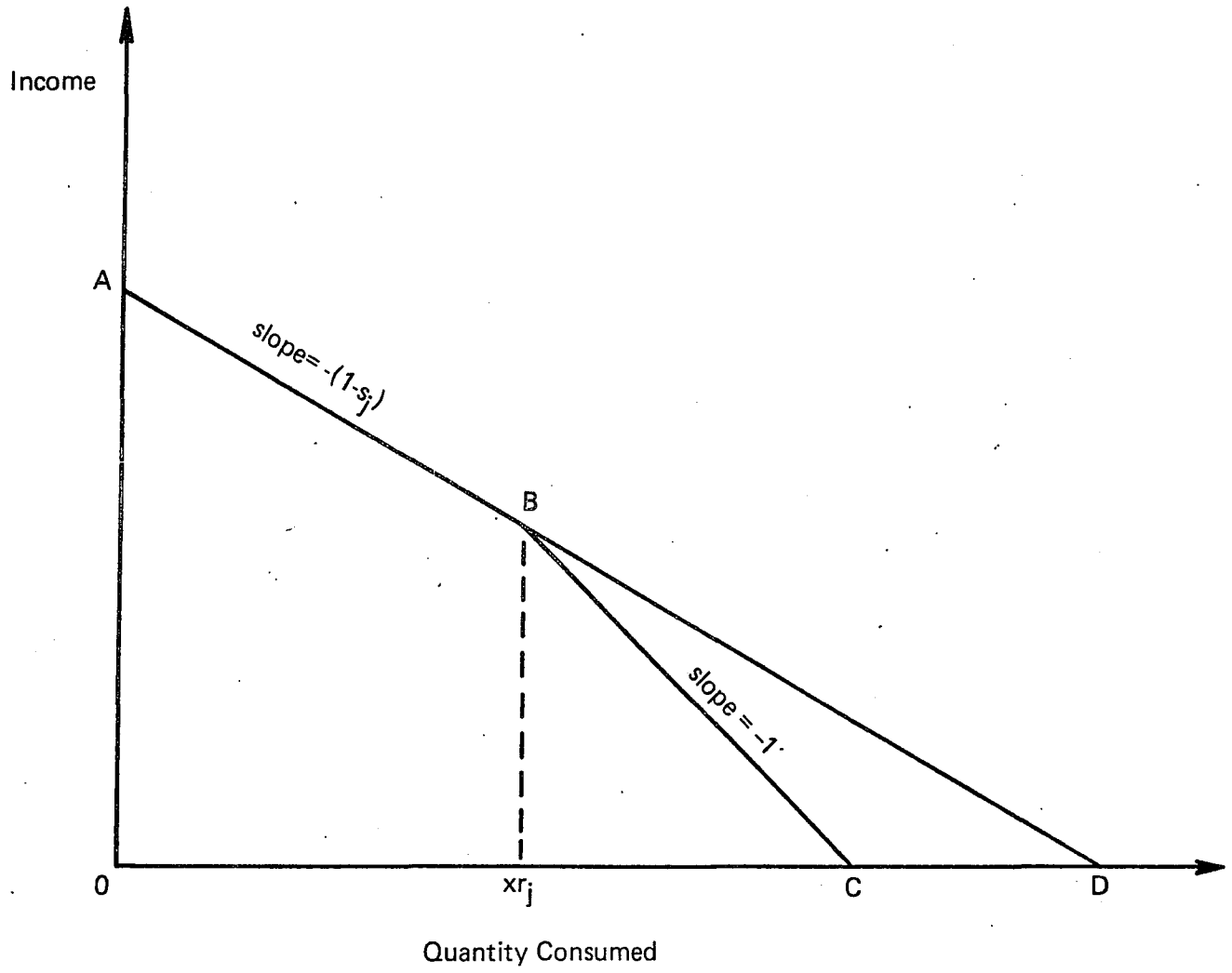
_so_. In this case the family pays $(1 - s_j) xr_j$ for the subsidized goods, and $xp_j - xr_j$ for the unsubsidized portion. The total cost is $xp_j - s_j xr_j$ as shown in (5). Note that $s_j xr_j$ is _de facto_ an outright cash transfer since the subsidy does not effect the family's market behavior at the margin.[16]

Subsidized items in Category III are those for which the recipient either _must_ consume a prescribed fixed quantity $xr_j$ or desires to consume this amount. Public housing, which restricts a recipient to one particular apartment, falls in this category.

Figure 1 relates the three categories to the budget constraint for a subsidized commodity. If the good is in category I, there is no relevant restraint imposed by regulation on the quantity the household can consume and the budget constraint is therefore AD. If the commodity is in category II, it is subsidized up to some quantity, $xr_j$ and the household must consume at least that quantity but consumes additional units purchased at the market price. Hence the household is restricted to the segment BC. In category III the quantity the household must consume and the price it must pay are both fixed; the budget constraint collapses to point B.

Now that the budget constraint (5) has been explained, we proceed to indicate the demand functions for each category of goods obtained from maximizing utility.

$$(6) \quad \text{Category I.} \quad xp_j = g_j + c_j(1-s_j)^{-\sigma} \left( \sum_I c_i(1 - s_i)^{1-\sigma} + \sum_{II} c_i \right)^{-1} A$$

---

[16]An example of an in-kind transfer in this category is the school lunch program, in which a student can get a 60 cent lunch for 30 cents, but not a 40 cent lunch for 20 cents nor two 60 cent lunches, but who may bring a sandwich. Of the five programs in this simulation, food stamps can fall into this category, though it may not if the family does not exceed its food stamp allotment when buying food. Similarly, rent subsidies may or may not be in this category, depending on family consumption choices.

(7) Category II. $xp_j = g_j + c_j (\sum_I c_j (1 - s_j)^{1-\sigma} + \sum_{II} c_i)^{-1} A$

(8) Category III. $xp_j = xr_j$

for all $\sigma$ and where:

$$A = (Y + \sum_{II} s_i(xr_i - g_i) - \sum_{I, III} (1 - s_i)g_i - \sum_{III} (1 - s_i)xr_i).$$

The Simulations. To obtain the simulated numerical values for the $xp_j$ from equations (6), (7) and (8), we need estimates of $c_j$, $g_j$, $s_j$, $xr_j$, Y and $\sigma$. The first two are know from the utility function, while we chose various representative values of Y and $\sigma$. We approximated the $s_j$ and $xr_j$ that a prototype family would face if it participated in program j by examining the specific regulations of each of the five in-kind programs and making several assumptions.[17]

The numerical values for the $xp_j$, are substituted into (1) and (2) to compute the family's utility $U^*$, given that it receives a particular set of in-kind transfers.

At this point we observe from (6) - (8) that the amount of food, shelter and medical care (i.e., the $xp_j$) demanded can vary as the category in which the corresponding in-kind transfer is placed varies. In turn, this means that $U^*$, a function of the $xp_j$, is not unique. The problem is partially mitigated because one can unambiguously assign Medicare and Medicaid to category I, and public housing to III. However, food stamps

---

[17]For example, federal regulations indicate that a two person family with cash income of $2869 in 1970 was eligible for $725 of food stamps at a cost of $583, a subsidy rate of .20. Because the family must buy all the stamps if it is to receive any, $xr = \$725$.

may fall in either categories II or III since the program permits a family's $xp_{food}$ to exceed $xr_{food}$ (II) or be equal to it (III). The actual outcome depends upon the family's demand functions for <u>all four</u> commodities simultaneously. (Rent supplements, similarly, can be in any category.)

To deal with this simultaneity problem, all permutations of categories were considered when the transfer package at hand included food stamps and/or rent supplements. Inconsistent results were eliminated; of the remainder, the one yielding the highest utility was selected for further analysis.[18]

Having determined the recipient family's utility $U^*$, given its cash income and its participation in a set of in-kind transfer programs, we next compute how much money income, EY, it would need to maintain the same $U^*$ if <u>no</u> in-kind transfers were available. We maximize (1) or (2) subject to the usual constraint that is in force when no in-kind transfers exist:

$$(9) \quad EY = \sum_{j=1}^{4} xp_j$$

This gives the quantities demanded as a function of EY:

$$(10) \quad xp_j^* = g_j + c_j \left( EY - \sum_{i=1}^{4} g_i \right) \qquad j = 1 \ldots 4$$

Substituting the right hand side into (1) or (2) produces the indirect utility function U(EY). Solving

$$(11) \quad U(EY) = U^*$$

___

[18]An inconsistent case exists if assigning good j to one category yields, from (6) - (8), an $xp_j$ that contradicts the assignment. For instance, a permutation placing rent supplements in category II (where xp > xr) might result in xp < xr; this case would be excluded.

## TABLE 4

### BENEFIT WEIGHTS FOR SELECTED PROGRAMS

| Program Package | Two Person Family | | | | Four Person Family | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Y = 2869 | | Y=4883 | | Y=3414 | | Y = 4706 | | Y=6572 | |
| | $\tau=.5$ | $\tau=1$ | $\tau=.5$ | $\tau=1$ | $\tau=.5$ | $\tau=1$ | $\tau=.5$ | $\tau=1$ | $\tau=.5$ | $\tau=1$ |
| f | 1.0 | 1.0 | na | na | 1.0 | 1.0 | 1.0 | 1.0 | na | na |
| p | .61 | .78 | na | na | .62 | .80 | .86 | .93 | na | na |
| r | na | na | na | na | na | na | .99 | 1.0 | .99 | .99 |
| mr | .81 | .89 | .91 | .95 | na | na | na | na | na | na |
| md | .64 | .76 | na | na | .67 | .78 | .74 | .85 | na | na |
| f,p | .72 | .85 | na | na | .90 | .95 | .94 | .97 | na | na |
| f,r | na | na | na | na | na | na | .98 | .99 | na | na |
| f, mr | .88 | .93 | na | na | na | na | na | na | na | na |
| f, md | .72 | .81 | na | na | .86 | .91 | .83 | .90 | na | na |
| p, md | .74 | .85 | na | na | .75 | .86 | .87 | .93 | na | na |
| r, md | na | na | na | na | na | na | .84 | .91 | na | na |
| f,p,md | .80 | .87 | na | na | .91 | .95 | .92 | .95 | na | na |
| f,r,md | na | na | na | na | na | na | .86 | .92 | na | na |
| f,p,mr | .85 | .92 | na | na | na | na | na | na | na | na |

na = ineligible for program

f = food stamps

p = public housing

r = rent supplements

mr = Medicare

md = Medicaid

gives $EY^*$ the cash equivalent of cash income, Y, plus in-kind transfers. Hence

the transfers provide a dollar benefit of $EY^* - Y$.

The taxpayer cost is:

$$(12) \quad TC = \sum_{I} (s_j + p_j - 1) x p_j^* + \sum_{II, III} (s_j + p_j - 1) x r_j^*$$

where market prices = 1 and $p_j$ = ratio of government cost price to market price.

(Note that when $p_j$ = 1, TC is simply the direct subsidy at market prices given

to recipients.)

The benefit weight is:

$$(13) \quad \frac{EY^* - Y}{TC} \quad .$$

A sample of the benefit weights obtained appears in Table 4. Of the

five prototypes families, two were two-person households and can be thought

of as elderly couples. One had a low income of $2869 and was eligible for

several transfers; the other's income of $4863 entitled it only to Medicare.

We assumed these families would not receive rent subsidies. The three

remaining families had four members and incomes of $3414, $4706, and $6572.[19]

Several notable observations emerge from the table. Turning first to

those instances in which households participate in only one program one con-

clusion easily drawn is that the food stamp program is a de facto cash trans-

fer. All families attach a weight of one to their benefits, because most

families spend more on food than their stamp allotment even if they receive

no stamps. Rent supplements can also be considered cash transfers in view

---

[19]These income figures correspond to the income classes in the <u>Summary</u>
<u>of Consumer Expenditures</u>, 1960-61, which are the original data, but are
inflated to 1970 price levels.

of the benefit weights of .99 and 1. Public housing, in contrast, benefits

the recipients less than the government's cost of providing it. For low

income households, the benefit weights in the range .6 to .8 indicate that

the gain from renting public housing at, say, $500 below market prices (i.e.;

an in-kind transfer costing $500) is between $300-400.[20] For the middle

income family, government housing subsidies are converted into direct con-

sumption benefits at more efficient rates (on the order of .9). Compared

to food stamps and rent supplements, the lower benefit weights for public

housing presumably reflect its category III nature. Recipients must

purchase the housing services of the assigned apartment, no more, no less,

and this rigid requirement may create a large distortion in consumption

patterns. The two medical transfers also have a wide range of benefit

weights. Even though Medicaid is free, its weights are not one.

Many families that receive one of the five in-kind transfers also

receive others. Because of this, the benefit weights for selected groups

of in-kind transfers are also presented in Table 4. The weight for a 2 or

3 program bundle is not an easily computed weighted average of the several

separate weights, but can only be derived independently. For example, the

benefit weight of a low income two-person family receiving both public

housing and Medicaid is greater than the weight of either program taken

singly. These outcomes arise because the addition of a new transfer changes

the relative prices of all commodities and thereby affects the total pattern

of consumption. The general tenor of these multi-transfer benefit weights

is that they are on the high side. Few dip below .8 and a number are close

to one.

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[20] The benefit weights on public housing are more variable then our table
suggests and fall as low as .24 in one instance. Packages of transfers which
contain public housing also, therefore, have quite variable, and frequently
quite low benefit weights. To a lesser content, there is some greater variability
in the weights then revealed by Table 4, for other housing programs as well.

TABLE 5

THE DISTRIBUTION OF IN-KIND TRANSFERS AT THEIR CASH EQUIVALENT VALUES

| | Recipient (ΔY) Valuation of Consumption Benefits | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Income Class | Food Stamps | Public Housing | Medicare | Medicaid | Total | Taxpayer Cost of 1-4 | Recipient Valuation of all In-Kind Transfers | Taxpayer Cost of all In-Kind Transfers |
|---|---|---|---|---|---|---|---|---|
| 0-999 | 9 | 2 | 62 | 47 | 120 | 222 | 457 | 559 |
| 1-1,999 | 30 | 10 | 123 | 110 | 273 | 433 | 594 | 756 |
| 2-2,999 | 50 | 11 | 138 | 153 | 352 | 453 | 764 | 865 |
| 3-3,999 | 53 | 11 | 117 | 114 | 295 | 357 | 794 | 856 |
| 4-4,999 | 45 | 10 | 104 | 133 | 292 | 343 | 902 | 953 |
| 5-5,999 | 34 | 7 | 81 | 135 | 257 | 275 | 940 | 958 |
| 6-6,999 | 24 | 4 | 66 | 59 | 156 | 156 | 856 | 856 |
| 7-7,999 | 17 | 2 | 55 | 33 | 107 | 107 | 905 | 905 |
| 8-9,999 | 16 | -- | 46 | 26 | 88 | 88 | 994 | 994 |
| 10-14,999 | 3 | -- | 35 | 24 | 62 | 62 | 1,136 | 1,136 |
| 15-24,999 | -- | -- | 37 | 11 | 48 | 48 | 1,210 | 1,210 |
| 25,000+ | -- | -- | 50 | -- | 50 | 50 | 1,965 | 1,965 |

To determine if our earlier conclusions on the impact of in-kind
benefits on the size distribution could be affected by moving to a cash
equivalent bases, we modified the entries in Table 3 based on the results
of Table 4. That set of benefit weights which would yield the maximum
change in Table 3's figures was chosen for this exercise.[21] Nonetheless,
Table 5 indicates relatively little change when compared to Table 3, except
for the three lowest income classes. A more pro-rich pattern than that of
Table 3 (as reproduced here in column 8) results because benefit weights
generally rise with income, but the change is slight. The income elasticity
of unweighted transfers is .22; after the cash equivalent adjustment it is
.27. For the unweighted distribution based on taxpayer cost the Gini coef-
ficient was .371; on a cash equivalent basis it rises to .374.

Our benefit weights apply only to consumption transfers. Consequently,
they have greater impact when attention is restricted to this type of trans-
fer, as seen when columns 5 and 6 are compared. Again, of course, benefit

---

[21]Specifically, we assumed $\sigma = .5$ and 1) public housing tenants receive
no other benefits, 2) Medicare enrollees receive no other benefits, and 3) all
food stamp recipients are on Medicaid and vice versa. These conditions, of
course, do not reflect the true pattern of program overlap in 1970. Also, a
greater change in Table 3's figures could be produced by assuming e.g., some
Medicaid recipients receive no food stamps. Our choices, however, yield the
largest change of any simple set of assumptions.

Since the simulations cover a limited income range, rough extrapolations
were used to obtain a full set of benefit weights. Table 5 was constructed
with the following weights:

| Income Class | Public Housing | Medicare | Food Stamps and Medicaid |
|---|---|---|---|
| 0-999 | .3 | .6 | .5 |
| 1-1999 | .5 | .7 | .6 |
| 2-2999 | .6 | .8 | .7 |
| 3-3999 | .7 | .85 | .85 |
| 4-4999 | .85 | .9 | .85 |
| 5-5999 | .95 | .95 | .95 |
| 6000+ | 1.00 | 1.00 | 1.00 |

weight calculations modestly increase the progressivity of in-kind transfers. Unweighted consumption transfers have income elasticity of $-.46$; applying the weights increases this number of $-.33$.

Table 6 displays the proposed Income and Outlay Account when in-kind transfers are incorporated at our minimum cash equivalent values ($\Delta Y$). Compared to the earlier accounts of Table 2, $\Delta Y$ is \$2,041 million (3%) less than the taxpayer cost. For food stamps, public housing, Medicare, and Medicaid, the only programs for which we have calculated benefit weights, the cash equivalent is 83% of taxpayer cost.[22]

TABLE 6

PERSONAL INCOME AND OUTLAY, 1970
($ millions)

| Outlay | | Income | |
|---|---|---|---|
| Personal Consumption | | Earned Income | |
| | | | 647,607 |
| Personal Consumption of Cash Redistribution | 645,566 | Cash Transfers | |
| Personal Tax Payments | | | |
| Personal Savings | | | |
| Personal Consumption of In-Kind Redistribution | 68,845 | Recipient Benefits from Government In-Kind Transfers | 66,804 |
| | 714,411 | | 714,411 |

We have not calculated the cash equivalent transfers for education. That the benefit weights appropriate to education may differ from one (at least for some income classes) is plausible enough to merit testing. Conceptually the framework developed for consumption goods is applicable, but the required assumptions are strained even more, and the data require-

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[22] One interpretation of Table 6, obviously, is that in-kind transfers in 1970 may have wasted as much as 2 billion dollars.

ments are more burdensome. For example, since private education is consumed even when public education is available, public and private education must be quite different goods. Appeal to budget data, therefore, will not yield a marginal propensity to consume public education directly, if at all. This, and the many other problems are not insuperable, but the effort required to overcome them was beyond our immediate resources.

Any reasonable set of benefit weights for education would be expected to rise with income, thus accentuating the pro-rich character of education beyond that in Table 3. However, the weights would have to be very low at the bottom end to effect any conclusions of the study in a critical way. To turn education benefits proportional over the income range from 1500 to 20,000 dollars, the benefit weight in the class 1000-1999 dollars would have to be as low as .14. On the other hand, introducing benefit weights for consumption goods did reduce the income of the lowest class from those transfers by almost 50 percent. If the weights at the low end of the distribution are as low for education as they may be for Medicaid, the increase in welfare of the poor due to in-kind transfers could be substantially overstated by Table 3. [23]

Though subject to considerable qualification, we conclude that our benefit weights undercut the argument that donor benefits rationalize the existence of in-kind transfers. Since in-kind transfers do not greatly alter consumption choices, they cannot be justified on donor benefit grounds.

Of course, our results are hardly definitive. Some, for example, may conclude from Tables 3 and 5 that consumption choices are importantly

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[23] However the Gini coefficient is not substantially altered when the Medicaid weights are applied to all human investment programs.

altered. Our failure to calculate benefit weights for education, the

largest in-kind transfer and the one most likely to generate external

benefits, is another limitation of the study.[24] Our estimated marginal

propensities to consume were crudely derived, as were our specifications

of program characteristics. Only one utility function was simulated.

Other valid criticisms can also be offered. Nevertheless, we believe

our results will prove robust. Our utility function is fairly flexible,

and was simulated with a wide range of elasticities of substitution.

## Taxpayer Benefits from In-Kind Transfers:  Estimating Redistribution Services

In this section we turn to the outlay side of our accounts and examine

the effects on the size distribution of personal outlays of distributing

the entry "Personal Consumption of Redistribution." Relying on our tenta-

tive simulation results, we ignore any benefits which may result from the

alteration of recipient consumption patterns. We simply assume that the

giving of in-kind transfers is a pure public good generating donor benefits.

Hence, we can use the methodology suggested by Aaron and McGuire and Maital

to quantify the taxpayer benefits from in-kind transfers. We intend these

calculations to be suggestive rather than definitive.

Maital's Methodology. Assume that for persons with income y,

(14)     $mu(g) = t(y)\lambda(y)$ , where:

   $mu(g)$ = marginal utility of in-kind transfer g

   $t(y)$ = tax price per unit of g

   $\lambda(y)$ = marginal utility of income

---

[24] See footnote 23, however.

Multiplying (14) by G, the number of units of in-kind transfers, and rearranging gives:

(15)     $G\ t(y) = G\ mu(g)/\lambda(y)$ .

Since the left hand side is the total taxes a household with income y would be willing to pay for the benefits it receives from public goods, $G\ t(y)$ is its imputed benefits, B, from giving. Making the strong assumption that all households have the same, separable utility function, mu(g) is a constant across all donors since, by definition, they consume the same quantity of redistribution. Applying (15) to donors i and j and dividing i's equation by j's produces:

(16)     $B_i/B_j = \lambda(y_j)/\lambda(y_i)$ .

Hence, the imputed benefits of G vary inversely with the marginal utility of income.

To apply (16) we assume, along with Aaron and McGuire and Maital, that $\lambda(y) = ay^{-\theta}$, where $\theta$ is the elasticity of marginal utility with respect to income. Hence (16) becomes:

(17)     $B_i/B_j = (y_i/y_j)^{\theta}$ .

As Maital explains, estimates of $\theta$ have been obtained from many econometric studies of consumption which use CES utility functions. These studies suggest that for the United States, $\theta \doteq 1.5$.

We can compute the distribution of taxpayer benefits from equation (17), and our lower bound assumption that the sum of the $B_k$ equals total cost, and the additional assumption that each household has the mean cash income of its class. We then have:

(18)     $B_i/B_j = (y_i/y_j)^{1.5}$ and

(19)     $\sum_{k=1}^{12} P_k B_k = \$68.8$ billion

where $y_k$ = mean income of class k, $P_k$ = number of households in class k, and \$68.8 billion = total spent on our selected set of in-kind transfers in 1970. The resulting benefits per household are shown in Table 7 (col. 1).

Column 1 indicates that taxpayer benefits are distributed in a steeply pro-rich pattern, a result which necessarily follows from our use of equation (18), with its income elasticity of benefits of 1.5.

To calculate the size distribution of outlays we sum "Consumption of Redistribution," the recipient value of consumption from in-kind transfers ($\Delta \ddot{Y}$) (col. 4), personal consumption, personal savings and adjusted personal taxes. For consumption, savings and all personal taxes we substitute C.P.S. cash income (col. 3). The required adjustment to taxes was made quite explicit in Exhibit IV where aggregate personal taxes were reduced by the value of "Consumption of Redistribution." That reduction is distributed in column 2, "Offsetting Tax Reduction," according to the incidence of all personal taxes in 1970 (Reynolds and Smolensky, Appendix C).

For each income class, the difference between personal income per household (cols. 3 + 4) and personal outlay per household (cols. 1 + 2 + 3 + 4) is the net sum of columns 1 + 2.[25] In setting up our accounts we expected that personal outlays would be more unequally distributed than personal income. That expectation was fulfilled but the difference is small. The Gini coefficient for the size distribution of outlays (col. 5) is .382, which slightly exceeds the coefficient on personal income (.374). It appears that donor benefits add about as much to inequality as the offsetting taxes reduce it.

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[25]This section assumed a CES utility function that is constant for all people; earlier we explicitly allowed the function to vary across income classes and by family size. Hence combining these results in Table 7 is not strictly justifiable.

TABLE 7

Taxpayer Benefits and the Distribution of Personal Outlays Per Household

|  | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
|  | Consumption of Redistribution | Offsetting Tax Reduction | Cash Income | Recipient Value of In-Kind Transfers | 1+2+3+4 |
| 0-999 | 4 | -67 | 260 | 457 | 654 |
| 1-1,999 | 53 | -67 | 1,508 | 594 | 2,088 |
| 2-2,999 | 112 | -176 | 2,461 | 764 | 3,161 |
| 3-3,999 | 186 | -300 | 3,468 | 794 | 4,148 |
| 4-4,999 | 273 | -441 | 4,471 | 902 | 5,205 |
| 5-5,999 | 366 | -540 | 5,445 | 940 | 6,211 |
| 6-6,999 | 473 | -632 | 6,452 | 856 | 7,149 |
| 7-7,999 | 588 | -731 | 7,458 | 905 | 8,220 |
| 8-9,999 | 770 | -879 | 8,920 | 994 | 9,805 |
| 10-14,999 | 1,138 | -1,143 | 12,120 | 1,136 | 13,251 |
| 15-24,999 | 2,285 | -1,654 | 18,410 | 1,210 | 20,251 |
| 25,000+ | 6,179 | -6,788 | 35,755 | 1,965 | 37,111 |

## Some Further Comparisons

Our measures of income inequality are sensitive to the definition of income. The distribution of factor earnings plus private transfers as measured in the C.P.S. has a Gini coefficient of .444. Adding governmental cash transfers, which yields the conventional concept of personal income, lowers the measure to .398. Our further modifications--adding in-kind transfers at their cash equivalent value, and taxpayer benefits with the appropriate adjustment to taxes paid--further lowers the Gini coefficient to .382.

Our accounts lead naturally to a modified concept of disposable income. To the conventional definition of consumption plus savings we add in-kind consumption at cash equivalent value and donor benefits. The Gini coefficient for this concept of disposable income is .372 compared to a coefficient of .380 for the conventional notion.

Comparing the reduction in inequality which results from altering the definition of income suggests the following:

i. Adding governmental cash transfers to factor income plus private transfers lowers inequality by .046. In contrast, adding in-kind transfers to factor income plus private transfers lowers inequality by .011.

ii. Personal Outlay as we define it has a Gini coefficient of .382, while as conventionally measured it is .398. This difference results from two opposing forces. Adding in-kind transfers to cash receipts reduces inequality by .024 but donor benefits increase inequality by .008.

iii. Subtracting Personal Taxes for our concept of Personal Outlay reduces inequality by .010.

CONCLUSION

We have urged that current practice in accounting for in-kind transfers in the Personal Income and Outlay Account be altered in the following ways.

i. All government in-kind transfers accruing to clearly identifiable beneficiaries should be included. The most important omissions are the transfers which augment human capital.

ii. Transfer income should be valued at the minimum cash transfer the recipients would accept to forego the in-kind transfer.

iii. The process of making the transfer should be viewed as an activity with a final output to be accounted for--a collective purchase which raises personal consumption (with an offsetting reduction in taxes).

To make more concrete what our proposals would involve, we illustrated them with a specific set of T accounts. Our proposed accounting practices could alter substantially our conceptions of the prevailing degree of income inequality. To the extent that in-kind transfers are distributed differently than cash income, the income side could show a marked change in income inequality. On the outlay side, the definition of disposable income is significantly altered, which also could shift measured income inequality.

We then provided an illustrative set of numbers to show how the size distribution of income was altered when in-kind transfers, treated our way, were distributed across income classes and added to cash income. The resulting changes were, in fact, quite small. Redistribution through in-kind transfer appears to consist of shuffling a great mass of things about, mainly in the dense middle of the distribution, with those in the lower tail gaining some.

The emphasis we put on valuing recipient benefits on a cash equivalent basis for the study of income distribution seems misplaced. Our simulations, while only suggestive, yielded rather high benefit weights. Therefore, donor

benefits generated by the alteration of recipient consumption patterns cannot be important.

Our results are in no sense definitive, however, and more useful work could be done. A low-income household survey that determined the number of recipients receiving more than one in-kind transfer and the mix of benefits they receive would be especially helpful. If most low income families are in several programs, then practical concern over recipient valuations of in-kind transfers would be ended. (Of course, why we engage in such transfers when benefit weights are 1, would emerge as an important issue in public economics.) If only a small proportion of households receive transfers from more than one source, attention to consumption of subsidized commodities by low income families would yield better income elasticities than were available for this study. Such a survey might also help to answer a variety of horizontal equity questions not otherwise tractable. The data collected would also permit rearranging households into an after-transfer distribution permitting a better understanding of the short-run effect of government on the distribution of income, when income is rather broadly defined.

An issue not yet amenable to household survey solutions is to better conceptualize and then to calculate the set of benefit weights appropriate for education and other human-capital-augmenting public programs.

The issues surrounding the concept of donor benefits also needs considerably more attention. It would be especially useful to contrast the results from assuming Pareto optimal redistribution with other models such as the median voter framework.

In summary, it seems quite acceptable to continue to account for in-kind transfers at cost (but including capital costs). The concept of in-kind transfers

in Personal Income and Outlay should be broadened, however, to include education and manpower training. The notion that redistribution is an activity augmenting personal income with a concomitant reduction in taxpayer burdens requires further theoretical and empirical consideration.

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