

HOW INEFFICIENT ARE MULTIPLE IN-KIND TRANSFERS?

MICHAEL P. MURRAY*

The inefficiencies from multiple in-kind transfers are smaller than one would guess from studying such programs singly, though Medicaid can give rise to average discounts as large as 60 percent. The benefits from the programs are quite large relative to recipients' incomes. Effective marginal tax rates under in-kind transfers are appreciably lower than they would be if the programs gave cash. Poverty rates among recipients are markedly lowered if one counts the value of in-kind transfers as income, thus effect is insensitive to whether one accounts for the discounting of in-kind transfers by recipients.

I INTRODUCTION

The anti-poverty system in the United States is a patchwork of programs: Aid to Families with Dependent Children (AFDC), Medicaid, food stamps, subsidized housing, Medicare, Supplemental Security Income (SSI), to name only the largest components. This patchwork resulted from political conflicts about poverty during the 1960s, when the anomaly of extensive poverty in the midst of American affluence spurred political efforts to alleviate the plight of the poor.

Two widely shared concerns slowed those efforts. First, many worried that giving money to the poor would undermine incentives to work. Second, some worried that the poor would misspend money given to them by government.

Supporters of aid to the poor took two roads to circumvent opponents' concerns:

* Professor of Economics, Bates College, Lewiston, Maine. I am grateful to Eleanor Brown, Rosanne Ducey, Ben Slay, Anne Williams, Andy Yuengert and two anonymous referees for constructive suggestions. I also benefitted from seminar participants' criticisms at Rand, UCLA, the Claremont Graduate School, Colby College, the University of Virginia, the University of Michigan, and Harvard University. Dan Weinberg provided intellectual and moral support throughout this work. I am especially grateful for his patience. This work was funded by a grant from the Department of Health and Human Services. Neither DHHS nor the many colleagues who improved this paper are responsible for the views I express or the errors I make.

First, cash grant programs (AFDC and SSI) were targeted for household groups about whose work effort there was the least concern—single-parent households and the elderly¹. Cash programs for other poor households were put aside. Second, numerous programs, “in-kind programs,” were designed with the ostensible purpose of increasing poor households' consumption of specific goods—food, housing, medical care, education—rather than providing those households with increases in general purchasing power. These measures, though very successful in overcoming political obstacles and turning federal resources to the needs of the poor, resulted in the complex patchwork quilt of poverty programs we see today.

Whether aid would induce recipients to stop working was the gravest question raised by critics. To resolve the question, Congress funded a series of ambitious and expensive social experiments, called the income maintenance experiments, designed to measure how much cash grant programs deter work effort.

Additional studies were funded to explore how well “in-kind” programs could

1 AFDC was already more than a quarter century old in the 1960s. However, benefit levels grew markedly during the late sixties and early seventies.

meet government's goals for helping the poor. Numerous of these in-kind studies focused on the fact that households value subsidies that restrict their choices less than they would value equally costly unrestricted grants.

All these investigations deepened our understanding of how government programs can and cannot help the poor, but they were limited by their failure to anticipate the complexity of the social welfare system. Almost all these investigations examined one program in isolation from all others, which made sense in the early 1960s when cash grants made up 90 percent of all aid to the poor and public housing was the only extensive in-kind program. But today cash grants make up less than one-third of aid to the poor and extensive in-kind programs offer food, medical insurance, and housing. The income maintenance experiments did not directly address the work incentive effects of in-kind transfers, and analyses that did focus on in-kind programs tended to overlook that many poor people receive several in-kind transfers.

Only studies of the incidence of poverty have consistently attended to the interactions among poverty programs. Browning [1975] first drew attention to the misimpression given by official poverty counts that included only money income during a period when in-kind transfers were growing markedly. Subsequent writers have been careful to account in one way or another for the impact of in-kind transfers on measures of poverty.

This paper examines how multiple program participation in AFDC, Medicaid, food stamps, and subsidized housing affects

- (i) the benefits from programs as viewed by the recipient,
- (ii) the efficiency of the programs relative to cash transfers
- (iii) the consumption patterns of in-kind subsidy recipients,

(iv) marginal tax rates faced by recipients,

(v) the incidence of poverty among recipients.

The benefits, efficiency, and consumption effects of individual programs have been studied by many (e.g., Olsen and Barton [1983], DeSalvo [1975], and Murray [1975, 1980] studied housing programs, Clarkson [1976] and Moffitt [1989] analyzed food stamps). These same effects for multiple programs have been examined by Murray [1983] and by Smith [1979], who looked at the joint effects of food stamps and housing programs, though neither author examined actual program participants. Hutchens [1978] analyzed the effects of AFDC on marginal tax rates and Murray [1980b] showed how the income maintenance experiment results could be used to analyze the work incentive effects of housing programs. Browning [1975], Smeeding [1977], and Weinberg [1985] offered careful studies of how the potpourri of poverty programs reduced the incidence of poverty.

This paper advances the works of Murray and of Smith in two ways: by adding to the analysis Medicaid, and by analyzing a random sample of non-elderly multiple-program participants. It advances the tax rate work of Hutchens and of Murray by simultaneously accounting for all the program constraints households face, and supplements Weinberg's study of how multiple-program participation affects the incidence of poverty. Weinberg worked with a larger and broader sample of households and focused on more programs, he did not, however, account for the discounting of in-kind benefits as we do here.

II. THE ANALYTICAL MODEL

In-kind subsidy programs have two basic purposes: to improve the welfare of recipients and to alter the consumption

pattern of recipients from what they would choose if given free reign over the subsidized resources. Offering a poor household a spacious new dwelling at a rent equal to what the household previously paid for its cramped slum dwelling both raises the household's well-being and ensures that all the subsidy is devoted to housing consumption.

Altering the recipient's consumption pattern is costly to the government. Recipients of restricted in-kind transfers would be willing to settle for some smaller unrestricted cash transfer, the reduction in cash value being just offset by recipients' increased flexibility in allocating resources. The difference in cost between an in-kind subsidy and its corresponding equivalent cash grants is often referred to as the "inefficiency" (or "deadweight loss") of the in-kind transfer. More accurately, this "inefficiency" is the cost government pays to alter the household's consumption pattern. See Nichols and Zeckhauser [1982] and Ross [1991] for discussions of rationales for choosing in-kind transfers instead of cash grants.

Equivalent cash grants and the associated deadweight losses are particularly appropriate measures of the efficiency of food and housing programs. Several presidential administrations have given serious consideration to "cashing out" these programs, i.e., replacing the programs with cash transfers of comparable value. For the food and housing programs, it is quite accurate to say that the measured deadweight losses reflect the cost savings government could realize if it gave up its efforts to alter the food and housing consumption choices of program participants.

Equivalent cash grants are a less appropriate measure of the efficiency of Medicaid. Not only has no administration ever proposed cashing out this program, but no administration is ever likely to do so. However, some accounting for Medicaid is necessary even for assessing food and housing programs. Households that par-

ticipate in Medicaid are freed the burden of much health insurance expense, consequently, their assessment of the consumption restrictions of food stamps or subsidized housing will be different than if they did not receive Medicaid.

Equivalent cash grants offer at least an upper bound on how much it costs government to alter the health care choices of poor people through Medicaid. If one were to estimate small deadweight losses from the program, one could rest easy that Medicaid induces little inefficiency in consumption patterns.

To measure the equivalent cash grant, the deadweight loss, and the consumption changes induced by a particular set of subsidies requires a detailed specification of welfare recipients' preferences. For purposes of quantification, the utility function of households must have a specific functional form. The Stone-Geary form is used here:

$$U = \pi \prod_{i=1}^n (x_i - \theta_i)^{\beta_i}, \quad \sum_{i=1}^n \beta_i = 1$$

in which U is utility, the X_i are goods, and the θ_i and β_i are parameters. The Stone-Geary form allows a wide variety of behavior (e.g., consumers can have some demands that are price or income elastic and other demands that are price or income inelastic). The primary restriction of the Stone-Geary is that as incomes rise both price and income elasticities must tend toward unity.

The Stone-Geary form yields a very useful closed-form solution for the equivalent cash grant associated with any consumption bundle.² For an individual with an unsubsidized money income y^0 , a bun-

2. In this analysis I treat each subsidized commodity as a homogeneous good. In fact, however, Medicaid offers a particular bundle of covered services, housing is a collection of attributes, and even food stamps limits which foods can be bought with the stamps.

dle of goods x_1^* , x_n^* offered in exchange for the consumer's entire income is worth as much to the consumer as an unrestricted cash grant (or tax, if negative) of

$$(1) \quad V = \pi \prod_{i=1}^n [(P_i^m x_i^* - P_i^m \Theta_i) / B_i]^{B_i} + \sum_{i=1}^n P_i^m \Theta_i - y^0,$$

where the P_i are the prices the recipient would have to pay for goods in lieu of the transfer program (See the appendix for the derivation of this result)

Furthermore, the Stone-Geary offers straightforward formulae for the consumer's optimal expenditures on each good if the consumer has y left to spend in unrestricted fashion at prices p_1, \dots, p_n

$$P_i x_i = P_i \Theta_i (1 - B_i) + B_i y - \sum_{j \neq i} P_j \Theta_j B_j$$

$i = 1, \dots, n$

Such formulae make it easy to evaluate what a consumer's consumption would be for any unrestricted equivalent cash grant scheme ($y = V + y^0$)

The Stone-Geary also facilitates computation of expenditures within any system of in-kind transfers

For example, if a particular program simply alters the prices of some commodities, simply replacing market prices with subsidized prices in the formula above obtains subsidized purchases

Alternatively, if a program constrains consumption of some items, say x_{k+1}, \dots, x_n to fixed levels $\bar{x}_{k+1}, \dots, \bar{x}_n$, then the consumer is faced with the problem of how to spend income left over after buying x_{k+1}, \dots, x_n for whatever is charged for them

This allocation problem is simply a variant on the original Stone-Geary problem. The consumer's preferences over x_1, \dots, x_k given $\bar{x}_{k+1}, \dots, \bar{x}_n$ are

$$W = \pi \prod_{i=1}^k (x_i - \Theta_i)^{B_i} \pi \prod_{j=k+1}^n (\bar{x}_j - \Theta_j)^{B_j}$$

Since the consumer's preferences are arbitrary up to a monotonic transformation, the constant

$$\pi \prod_{j=k+1}^n (\bar{x}_j - \Theta_j)^{B_j}$$

can be ignored and we can take W to the

$$(1 / (\sum_{i=1}^k B_i))$$

power. This yields

$$W^* = \pi (\lambda_i - \Theta_i)^{B_i} / \sum_{i=1}^k B_i,$$

which is, once again, a Stone-Geary specification. Thus, expenditures on x_1, \dots, x_k conditional on $\bar{x}_{k+1}, \dots, \bar{x}_n$ and the expenditure for them, can be obtained using conditional expenditure equations analogous to those above, in which income is replaced by income minus the cost to the recipient of $\bar{x}_{k+1}, \dots, \bar{x}_n$

A slightly more complicated problem arises when a subsidy program requires that expenditures be no less than a pre-specified level \bar{x}_i . One must solve first for optimal expenditure with the constraint not binding to see if the consumer would freely choose more of x_i than the specified minimum. If more would not be chosen, then the above method for determining constrained behavior is appropriate, if more would be chosen, then the constraint is ignored and expenditures are determined in the first manner described.³

3 As Moffitt [1989] notes, if the consumer can sell excess \bar{x}_i , there is no constraint. In-kind transfers vary in their fungibility, with food stamps the easiest to sell. I ignore such sales.

TABLE I
Coefficients for the Stone-Geary Utility Function

	Food	Housing	Medical	Other
θ	35 (1.99)	61 (2.06)	30	01 (1.54)
B	11 (3.3)	17 (4.3)	09	63 (5.2)

Approximate *t*-statistics conditional on medical parameters in parentheses

When there are several constraints, one must examine all possible combinations of binding and non-binding constraints. When more than one combination is feasible, the option offering the highest utility is best for the consumer. Further, when offered several subsidies one must ask if declining some of them (while perhaps accepting others) would yield greater utility than would accepting all of them.

A computer program searched over the possible combinations of subsidies and patterns of binding constraints to find the optimum. Parameters for the Stone-Geary utility function were chosen to examine a set of actual subsidy programs with a sample of actual subsidy recipients.

The coefficients for the Stone-Geary specification (reported in Table I) are drawn from two sources.⁴ First, the coeffi-

4 I assume homogeneous tastes across the households. Nichols and Zeckhauser [1982] and Moffitt [1989] argue heterogeneity often may be important in in-kind transfer programs. However, Kennedy and MacMillan [1980] found no evidence of such self-selection in the Housing Allowance Demand experiment.

Homogeneous tastes are not necessarily at odds with the observation that households with equal incomes sometimes choose different patterns of program participation. Housing subsidies are provided to only a fraction of eligible applicants. AFDC and Medicaid are generally not available to two-parent households. Program constraints vary from state to state and sometimes from city to city. These considerations could lead to varied participation rates without any variation in tastes.

icients for housing, food, and other non-medical expenditures were obtained econometrically using the 1972-73 Consumer Expenditure Survey (CES) and price data from the Bureau of Labor Statistics "Three Budgets for an Urban Family of Four." Maximum likelihood was used to estimate the coefficients of a system of linear expenditure equations, imposing across equations the parameter restrictions implied by the Stone-Geary form (See Phelps [1974] for details). Second, coefficients for medical expenditures were imposed that yielded price and income inelastic demands for the medical commodity, consonant with the findings from the National Health Insurance Experiment (NHIE) (Manning et al [1987] and Newhouse and Phelps [1974]). The additive separability of the Stone-Geary specification permits consistent estimation of non-medical goods' coefficients separately from those of the medical commodity.

The appropriate measure to use for medical consumption raises a nettlesome question about this analysis. Subsidized medical consumption is measured as the average actuarial value of Medicaid benefits paid in a given state to households of a given composition. Treating Medicaid as offering insurance is at odds with the certainty framework of the utility analysis. The formidable task of integrating uncertainty into the analysis of in-kind transfers is left for others.

TABLE II
The Wherewithal of Multiple-Subsidy Recipients

Program Combination	Earnings	Total Money Income	Market Value of Resources
	Mean	Mean	Mean
AFDC, Medicaid, food, housing	84	380	877
AFDC, Medicaid, food	304	566	801
AFDC, Medicaid, housing	422	584	829
Food, housing	579	579	894
Medicaid, AFDC	453	610	740
Total	325	520	829

All figures are measured in 1979 dollars per month

The price and income inelastic demands for housing and food that we obtain from the CES data are similar to those we obtained with a similar econometric methodology using data from the Michigan Panel Survey of Income Dynamics (Murray [1983]). The price and income inelastic results for both food and housing are consonant with surveys of these elasticities (Mayo [1981] and Kmenta et al [1976]). The food elasticities are in the lower end of those reported in Kmenta et al, but are moderately higher than those they obtained using the PSID

and housing programs) in the United States based on the (sample weighted) means for such participants found in the first two rotation groups of the 1979 Income Survey Development Panel (ISDP)⁵

Real expenditures on means-tested transfer programs have been fairly constant over the past decade, although the mix between cash and in-kind transfers has continued to shift modestly as real Medicaid expenses have grown and real cash transfers have shrunk (Burtless [1986]). But the biggest differences be-

III THE ECONOMIC EFFECTS OF MULTIPLE PROGRAM PARTICIPATION

Benefits and Deadweight Losses

Table II demonstrates that welfare program benefits are a substantial portion of the total resources available to participating households. The table reports the mean monthly non-welfare money income, mean monthly total money income, and mean monthly total resources (money income plus the market value of in-kind subsidies) for non-elderly multiple-program participants (participants in two or more of the AFDC, Medicaid, food stamps,

5 The ISDP was the precursor of the recurrent Survey of Income and Program Participation (SIPP). Both the ISDP and SIPP are stratified random samples of US households. The surveys are designed to permit analysis of both transfer program eligibility and program participation. Processing costs precluded analysis of all three rotation groups. Since the three rotation groups were drawn independently, use of two groups introduces no biases. Our sample consisted of 239 multiple-program participants, 19 in AFDC and Medicaid only, 73 in AFDC, Medicaid and food stamps, 26 in food stamps and subsidized housing, 17 in AFDC, Medicaid, and subsidized housing and 104 in all four programs. Using the ISDP sampling weights, 30 percent of the multiple program participants were in all four programs, 25 percent were in AFDC, Medicaid, and food stamps, 26 percent were in food stamps and subsidized housing, 11 percent were in AFDC and Medicaid only, and 8 percent were in AFDC, Medicaid, and subsidized housing. For details of the ISDP, see Yeas [1979].

TABLE III
 Equivalent Cash Grant Measure of Benefits and Deadweight Losses
 from In-Kind Transfers Only

Program Combination	Total Benefits	Deadweight Loss	Benefits/ Cost
	Mean	Mean	Mean
AFDC, Medicaid, food, housing	361	136	73
AFDC, Medicaid, food	155	80	66
AFDC, Medicaid, housing	187	58	76
Food, housing	223	91	71
Medicaid, AFDC	84	131	39
Total	216	103	68

Total benefits = equivalent cash grant

Cost = market value of subsidized bundle consumed

Total benefits \pm deadweight loss = cost

All figures are measured in 1979 dollars per month

tween 1979, when our sample was drawn, and the present is not in the levels of benefits offered, but in the rules surrounding those benefits. The two most important changes have been in the food stamp program and the AFDC program consumption requirements of the food stamp program have been markedly altered and marginal tax rates in AFDC have been dramatically raised.

Prior to 1980, the food stamp allotment to a household was determined by the size of the household while the cost of the stamps to the household was based on household income. For example, a three-person household might be offered \$120 in stamps. A family with an income of \$100 might pay \$25 to receive the \$120 in stamps. Since 1980, the purchase requirement has been eliminated. No longer would that family have to pay \$25 for \$120 in stamps. Under the new rules, that family would simply be given \$95 in stamps, the difference between their old food stamp allotment and purchase requirement. This dropped the consumption requirement from \$120 to \$95 for this family.

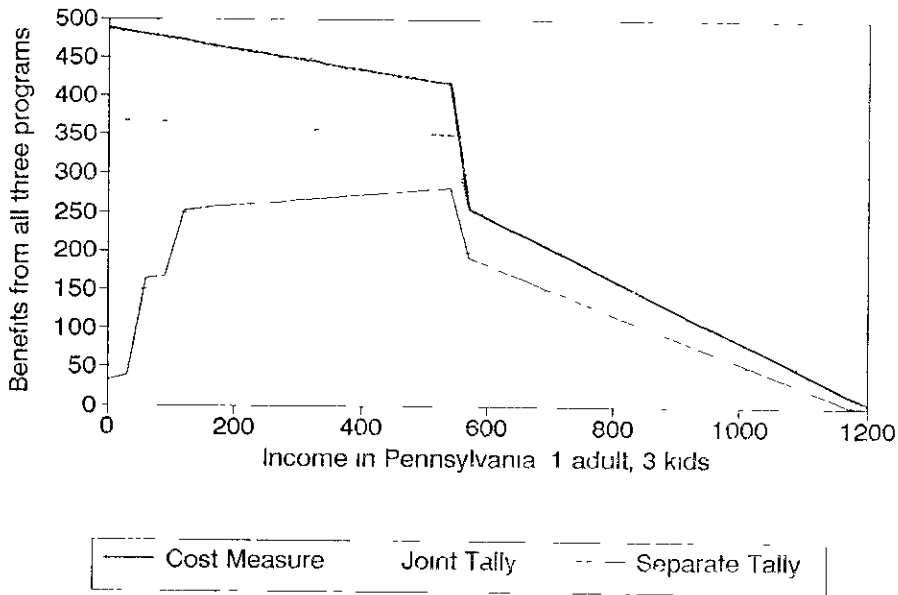
Prior to 1981, the statutory marginal tax rate in the AFDC program was two-thirds. Since 1981, the rate has been 100 percent.

Most of our computations below pertain to 1979, the year from which our data are drawn. However, we also simulate the food stamp program rule changes that occurred in the early 1980s.

The analytical framework of section II cautions us that evaluating in-kind programs at the market value of the subsidy given will overstate the value of the subsidy to recipients. If one focuses only on the in-kind subsidies, as in Table III, the discounting of the benefits is high. Recipients of AFDC and Medicaid alone discount over 60 percent of the value of Medicaid and across all recipients over 30 percent of the value of in-kind transfers are discounted.

The substantial deadweight losses reported in Table III warrant asking if the consumption effects of in-kind programs justify such substantial inefficiencies. The deadweight losses from food stamps and housing programs accurately measure the cost to government of not cashing out

FIGURE 1
Benefit Measures AFDC, Medicaid, Food
Cost, Joint Tally, Separate Tally



those programs. However, as noted in section II, equivalent cash grants are not a viable alternative to Medicaid, the true inefficiency of Medicaid is likely to be substantially less than equivalent cash grants would indicate.

The benefit and deadweight loss estimates reported in Table III simultaneously consider all the programs in which a household participates. How would the results differ if each of the programs were studied separately, with benefits and deadweight losses summed across the individual assessments? To answer this question, simulations were conducted both for households at several levels of income and for households receiving several combinations of subsidies.

Generally, at very low earnings, the separately computed benefits vastly underestimate the joint benefits—by as much as 60 percent at incomes below \$100 per month. Figure 1 depicts three graphs. The uppermost graph is the market value of

the subsidies offered to a household participating in AFDC, Medicaid and food stamps programs in Pennsylvania in 1979 (Pennsylvania was chosen because AFDC benefits in that state are in the mid-range of generosity). The middle graph is the equivalent cash grant value of those programs to the recipient when all the programs are assessed simultaneously. The bottom graph is the sum of the equivalent cash grants from the three programs assessed separately.

As the figure illustrates, both food stamps and Medicaid are valued little by extremely cash-poor households, recognition of the AFDC cash subsidy when evaluating the in-kind benefits makes a marked difference at low incomes. But through the entire range of income over which the household receives all three subsidies, the separate benefit evaluation is well below the joint estimate, running about two-thirds of the joint benefit. Once the household receives only food stamps

TABLE IV
Deadweight Losses from Alternative Program Participation

Patterns for 3- and 4-Person Single-Parent Households
in Pennsylvania

	3-Person Household Earnings			4-Person Household Earnings		
	0	200	400	0	200	400
Medicaid + AFDC	99	79	67	119	100	87
Medicaid + AFDC + FS	100	75	61	140	112	94

All figures are measured in 1979 dollars per month

and housing, the relative and absolute discrepancy in benefit estimates declines steadily. Unfortunately, since the lower one's income the more likely one is to participate in more programs (see Table II), the biases from separate consideration of program benefits for multiple-program participants are likely to be considerable. The joint computation used in this paper is essential.

Table IV suggests that participation in food stamps or housing by recipients of AFDC and Medicaid may improve not only average program efficiency but even the absolute efficiency of the in-kind programs. Mean deadweight loss is lower for participation groups that add those programs to AFDC and Medicaid than for groups that do not. However, one must be cautious in such an interpretation. The earnings, demography, and geography of program participants vary sharply across the groups in Table III, as is noted in Table II. To assess how participating in an additional program affects transfer efficiency requires controlling for family size, income, and location.

Table IV focuses on three- and four-person households receiving AFDC in Pennsylvania to show that the effect of adding food stamps to Medicaid and AFDC can either raise or lower deadweight losses. (In all these cases the average efficiency

risks because food stamps distort consumers' choices much less than does Medicaid.) Adding only housing subsidies to Medicaid and AFDC also sometimes increases and sometimes decreases deadweight losses for individual households.

For households of all sizes, incomes, and states, adding *both* food stamps and housing subsidies to Medicaid and AFDC does lower deadweight loss when compared to AFDC and Medicaid alone or when compared to AFDC, Medicaid, and either food stamps or housing aid. (This finding cannot be seen in Table III because actual participants in all four program have much lower incomes than participants in fewer programs.) Furthermore, cashing out food stamps and housing aid would in practice always reduce the inefficiency associated with Medicaid for joint program recipients.

We next turn to the estimated effects of multiple subsidy program participation on the consumption patterns of recipients and compare those patterns to the consumption patterns estimated for several cash out options.

Consumption Effects

Table V reports three levels of 1979 housing consumption for multiple-program recipients. The first column of num-

TABLE V
 Housing Consumption with All Transfers, with Equivalent Cash Grants (ECG)
 and with Cash Transfers Only

Program Combination	With All Transfers	With ECG	Cash Transfer Only
	Mean	Mean	Mean
AFDC, Medicaid, food, housing	288	217	151
AFDC, Medicaid, food	191	196	170
AFDC, Medicaid, housing	256	199	169
Food, housing	290	205	169*
Medicaid, AFDC	173	182	163
Total	244	199	164

All figures are measured in 1979 dollars per month

*Represents unsubsidized consumption

bers contains the housing consumption given actual program constraints, i.e., given all transfers received, cash and/or in-kind. The next column contains the housing consumption that would occur if program participants were given equivalent cash grants in lieu of program benefits. The final column contains the housing consumption that would occur if program participants received no in-kind transfers (absent any labor supply effects).

In-kind transfer programs increased the housing consumption of all multiple-program recipients by nearly 50 percent from \$164 to \$244 in 1979. Dropping all constraints by providing equivalent cash grants would lower housing consumption by about 20 to 30 percent for housing program participants. However, the food stamp and Medicaid constraints are such that people who receive no housing subsidies would raise their housing consumption if all constraints were dropped. On balance, the consumption requirements of the in-kind transfer programs raise housing consumption of multiple-program participants by about 20 percent compared to equivalent cash grants.

The old food stamp program similarly increased food consumption. In-kind subsidies raise the food consumption of multiple-program participants by 24 percent, from \$154 to \$194. Food stamp recipients would tend to cut their food consumption (except for recipients of all four subsidies who would hardly alter their food consumption) from 2 to 16 percent, while people with no food stamps would raise their food consumption 2 to 5 percent, if all constraints were dropped and equivalent cash grants given. On balance the consumption requirements of the in-kind transfers drove up food consumption by 8 percent compared to equivalent cash grants.

This highlights one perverse feature of our system of multiple in-kind programs. The old food stamps program did promote food consumption vis-a-vis equivalent cash grants (although only a modest fraction of food stamp recipients are actually constrained by the program's minimum consumption requirements). And housing aid does promote housing consumption. As a consequence, some people consume more housing and some people consume

TABLE VI
Proportion of Food Stamp Recipients Bound
by Consumption Requirements

Program Combination	Old Rules	New Rules
AFDC, Medicaid, food, housing	36	3
AFDC, Medicaid, food	75	21
Food, housing	70	6
Total (given food stamps)	59	9

more food because of these programs. However, households receiving multiple subsidies, but not housing aid, consume less housing than with equivalent cash grants. And households receiving multiple subsidies, but not food stamps, consume less food than with equivalent cash grants. On balance, there is a positive net effect of consumption restrictions on average housing and food consumption among multiple-program participants, but for some households the housing and food subsidies work at odds with one another.

Across all food stamp recipients, it is likely that both the old and the new consumption requirements have constrained only a modest fraction to increase their food consumption. However, among multiple program participants—people whose incomes are especially low—the effect of the old consumption requirement was more extensive. Table VI reports the fraction of multiple-program food stamp recipients found to be constrained under the old and new rules.

In 1979, 59 percent of all multiple-program participants who received food stamps were constrained by the consumption requirement to purchase more food than they would freely choose. Applying the new rule to those same households drops the percentage who are constrained to only 9 percent. The economic consequences of this change were two. The average food consumption of these house-

holds fell about \$20 per month and the equivalent cash value of the subsidies rose about \$10 per month.

It would not appear too strong to claim that the food stamp program has already been cashed out, and that the savings in costs have not been kept by government but have been passed on to food stamp recipients as increased benefits. This finding accords with the findings of Moffitt [1989] and Fraker et al. [1986] using data for Puerto Rico.

Table VII reports the results for medical consumption. For all multiple-subsidy recipients, constrained medical consumption is more than double the medical consumption in the absence of in-kind transfers and two-thirds again what it would be if households received unconstrained equivalent cash grants.⁶

Table VIII reports the consumption story for all other expenses. The in-kind transfer programs permit recipient households to markedly increase their consumption of other, i.e., non-food, non-housing, non-medical, goods. On average, the increase is over 55 percent above cash-trans-

⁶ This finding and the estimated deadweight loss associated with AFDC and Medicaid are the only two results in this section that are markedly sensitive to the choice of parameters of the Stone-Geary specification. If the econometrically estimated parameters had been used, the unconstrained consumptions would fall by half and the deadweight loss double.

TABLE VII
 Medical Consumption with Transfers with Equivalent Cash Grants (ECG)
 and with Cash Transfers Only

Program Combination	With In-Kind	With ECG	Without In-Kind
	Mean	Mean	Mean
AFDC, Medicaid, food, housing	152	66	35
AFDC, Medicaid food	111	63	50
AFDC, Medicaid, housing	116	60	45
Food, housing	60	66	50
Medicaid, AFDC	86	63	45
Total	110	62	45

All figures are measured in 1979 dollars per month

fer-only levels. Moreover, if the programs' consumption constraints were dropped, the households would raise these expenditures about 16 percent above their all-transfer constrained levels.

Some readers may be troubled that in-kind transfers to the poor permit such large increases in the consumption of "other" goods. However, because the pre-subsidy budget share of food and housing is so high, over three-quarters, subsidy recipients are relatively "starved" for other consumption, and hence devote much of marginal resources to those goods. Nonetheless, even when receiving equivalent cash grants, the households continue to spend about 50 percent of their incomes on food and housing, a figure quite in accord with our common notions of reasonable spending.

Equivalent Marginal Tax Rates

The AFDC, food stamp, and housing programs all contain provisions to lower subsidies as household income rises. When one paints the program rules in broad brush, the net result of these provisions is a dramatic marginal tax rate. (See

Aaion [1973], Leonesio [1988], and Fraker et al [1985].)

Simply summing the 1979 marginal "tax rates" (benefit reduction rates) of AFDC (67 percent), housing programs (25 percent), and the food stamp program (25 percent) yields a crude cumulative marginal tax rate of 117 percent.⁷ However, a more subtle analysis is required to calculate statutory marginal tax rates for participants in multiple programs.

The statutory marginal tax rate is softened by three influences.⁷ First, since the food stamp and housing programs count AFDC income, reductions in that income with increased earnings are partially offset by higher in-kind transfers. Second, pro-

7 The 100 percent statutory benefit reduction rate that has been used in the AFDC program since 1981 makes these three influences moot. For many AFDC recipients additional work now yields no additional income no matter what the provisions of other programs. (See Moffitt and Rangarajan [1991] for an analysis that argues marginal tax rates little affect recipients' labor supply. Leonesio [1988] offers another view.)

Since one would hope that AFDC recipients will, in the future, have their incentive to work restored, an analysis of marginal tax rates below 100 percent, as in 1979, is means of interest.

TABLE VIII
Other Consumption with Transfers with Equivalent Cash Grants (ECG)
and with Cash Transfers Only

Program Combination	With In-Kind	With ECG	Without In-Kind
	Mean	Mean	Mean
AFDC, Medicaid, food, housing	205	279	59
AFDC, Medicaid, food	263	284	192
AFDC, Medicaid, housing	287	334	219
Food, housing	287	349	207*
Medicaid, AFDC	286	346	255
Total	256	296	165

All figures are measured in 1979 dollars per month

gram rules do not always fully count earnings when taxing benefits.⁸ Third, increased earnings lower the inefficiency of in-kind transfers, thereby raising the real income of recipients. Table IX reports the 1979 statutory benefit reduction rates for the four major transfer programs in various combinations. Accounting for program interactions is clearly of considerable importance. Simply summing marginal tax rates across programs yields marginal tax rates that are from 4 to 29 percentage points higher. But focusing exclusively on statutory marginal tax rates will also lead to non-trivial errors.

Households constrained to consume larger quantities of food, housing, or medical care than they would prefer have an extra incentive for obtaining higher earnings. With more income in hand, program consumption requirements are not as restrictive, and the in-kind subsidies one is

receiving become more attractive. I call the marginal tax rates that account for the effect of constraints "equivalent" marginal tax rates, equivalent marginal tax rates are one minus the increase in equivalent income resulting from a one-dollar increase in money income.

Table X reports the equivalent marginal tax rates for participants in all four programs and in AFDC, Medicaid, and food stamps when one accounts for the sensitivity of equivalent cash grants to changes in money income. At low earnings (\$50 per month), the equivalent marginal tax rates are twenty to twenty-five points below the statutory rates, at higher incomes, the equivalent rates are still seven points below the statutory rates if the individual is in multiple programs. Above the AFDC cutoff, the marginal tax rates drop markedly because there are no more AFDC benefits to be taxed.

Careful distinctions between statutory and equivalent marginal tax rates become moot if the statutory rate is 100 percent, as it has been for AFDC participants since 1981. If the household cannot keep any of

8 Fraker et al [1985] estimate how statutory marginal tax rates are affected by the exemption of some earnings from taxation. They dub the resultant marginal tax rates "effective" rates.

TABLE IX
Marginal Market Value Benefit Reduction Rates
Given Program Interactions

AFDC + Medicaid + food stamps + housing	788
AFDC + Medicaid + food stamps	- 705
Food stamps + housing	443
Food stamps	- 205
Housing	238
AFDC	- 667

TABLE X
1979 Equivalent Marginal Tax Rates

Monthly Earnings	AFDC, Medicaid, Food Stamps, Housing	AFDC, Medicaid, Food
Statutory Rate	79	71
\$50	58	45
\$100	68	60
ACI*-\$200	71	62
ACI-\$100	72	63
ACI+\$100	37	21
ACI+\$200	39	21

*ACI—AFDC Cutoff Income, the income at which AFDC benefits become zero

its earnings, it cannot alter the equivalent cash value of in-kind transfers

The Incidence of Poverty

Table II showed that the major welfare programs provide the bulk of economic resources for multiple-program participants. One important indicator of the adequacy of these program benefits is how well they enable poor households to emerge from poverty.

The first four rows of the top panel of Table XI present the market value of individual program benefits in 1979 for three-

person, single-parent households without earnings, expressed as a fraction of the 1979 poverty line. Since the AFDC, Medicaid, and housing programs vary widely in their generosity across states, the table contains benefit levels for three illustrative states, Texas, Pennsylvania, and Wisconsin. These states are representative of low, middle, and high benefit states around the country. Benefits from AFDC vary most sharply across states, varying by a factor of three.

At first blush one might assess the generosity of joint program benefits by simply summing the benefits across pro-

TABLE XI
 Program Benefits for Three-Person, Single Parents without Earnings, Expressed
 as a Fraction of the 1979 Poverty Line

	Texas	Pennsylvania	Wisconsin
<i>Market Values of Individual Program Benefits</i>			
AFDC	32	65	90
Medicaid	24	23	30
Food stamps	34	34	34
Housing	60	63	65
AFDC, Medicaid, food stamps	901	221	54
All four programs	1 50	1 85	2 19
<i>Market Values of Joint Program Benefits</i>			
AFDC, Medicaid, food stamps	85	1 10	1 35
All four programs	1 26	1 47	1 67
<i>Equivalent Cash Values of Joint Program Benefits</i>			
AFDC, Medicaid, food stamps	50	89	1 15
All four programs	1 03	1 29	1 51

grams. The bottom two rows of the top panel of Table XI contain the results of such calculations. However, this simple approach is misleading and overstates the actual market value of the benefits from joint program participation.

The food stamp and housing aid programs treat AFDC benefits as income for purposes of computing food and housing subsidies. Consequently, the actual market values of joint program participation for persons with no earnings are those given in the middle panel of Table XI. AFDC, Medicaid, and food stamps deliver 5.6 to 12.3 percent less resources and all four programs together deliver 16 to 23.7 percent less resources than naive computation indicates.

The effective generosity of the programs is still less than these market value

assessments indicate, since households discount in-kind program subsidies. Table XI shows that reliance on equivalent cash grant measures of poverty markedly lowers the fraction of the poverty line offered to joint program participants who have no earned income.

Table XI shows how the major welfare programs would affect the poorest households, those with no earnings. But actual participants in multiple-programs are not generally without earnings. Table XII shows the poverty status rates for multiple program participants, again using our ISDP sample households.⁹ Column 1 indicates the fraction of multiple program

⁹ Table XII abstracts from the work incentive effects of the programs.

participants who would be poor if their earnings were their only resources. Column 2 indicates the poverty rate if AFDC cash subsidies are counted in judging poverty status (this would be the poverty rate according to the official poverty standard). Column 3 indicates the poverty rate if one includes the market value of all subsidies in judging poverty status. Column 4 indicates the poverty rate if the equivalent cash grant is used to evaluate the value of all subsidies.

AFDC benefits raise some multiple-program participants out of poverty, these cash transfers lower the poverty rate by 8 percentage points. The in-kind programs reduce this poverty rate by yet another 41 percentage points, or 65.1 percent, if one relies on equivalent cash grants to measure the value of in-kind transfers. But it is comforting to note that failure to account for the discounting of in-kind benefits does not lead one to seriously misjudge the efficacy of the social welfare system in eliminating poverty. An analyst who relied on the market value of the in-kind transfers would understate by one-seventh, or three percentage points, the actual incidence of post-transfer poverty among multiple program participants. Since multiple subsidy program participants are—in the absence of the programs—among the neediest of households, it is noteworthy and no mean accomplishment that the major poverty programs can reduce the incidence of poverty among these households by 49 percentage points or 69 percent.

IV. CONCLUSIONS

This examination of participants in multiple poverty programs highlights both the practical importance of in-kind transfers and the analytical importance of not studying poverty programs one at a time. Six noteworthy conclusions follow.

(1) Analyzing program benefits separately threatens to noticeably understate

total program benefits. Households participating in the AFDC and Medicaid programs tend to have lower deadweight losses when also participating in food stamps or housing programs, even when those latter programs add additional binding constraints on the consumer.

(2) Poverty is cut by almost 70 percent among multiple program participants and more than half this cut is due to the in-kind transfer programs.

(3) Subsidy program constraints can have large effects on the effective marginal tax rates faced by multiple program participants, but statutory program interactions are even more important.

(4) Medicaid and housing subsidies do stimulate consumption of those goods more than cash transfers would. Housing consumption is about one-fifth higher and medical consumption is about two-thirds higher than they would be without consumption requirements. But in-kind transfers are almost half again as costly as the cash transfers that recipients would value equally.

(5) Medicaid fares especially poorly when compared to equivalent cash grants, but equivalent cash grants are not a viable alternative to Medicaid as they are for food stamps or housing programs, government has, and would in the future, provide some form of indigent care. To fully assess the inefficiency of Medicaid, one must specify a viable alternative to Medicaid.

(6) Elimination of the food stamp purchase requirement has effectively "cashed out" the program. Fewer than 10 percent of food stamp recipients in multiple programs are affected by the program's food consumption requirements. Since multiple-program participants are among the most needy food stamp recipients, it is likely that even fewer of other food stamp recipients are now affected by food stamps' food consumption requirements.

Finally, several suggestions emerge for future analyses of in-kind transfers.

TABLE XII
Poverty Among Multiple Program Recipients Using Several
Measures of Their Wherewithal

Program Combination	Earnings Poor	Total Money Poor	Market Value	Equivalent Value
	Mean	Mean	Mean	Mean
AFDC, Medicaid, food, housing	0 94	0 85	0 00	0 00
AFDC, Medicaid, food	0 75	0 68	0 45	0 48
AFDC, Medicaid, housing	0 53	0 40	0 00	0 12
Food, housing	0 41	0 41	0 03	0 08
Medicaid, AFDC	0 65	0 49	0 47	0 49
Total	0 71	0 63	0 19	0 22

Analysts should continue counting poverty using the market values of resources, the market value is simple to compute and works better than the magnitude of deadweight losses might lead one to surmise. Although deadweight losses from in-kind transfers are more than a quarter of total resource costs (see Table IV), the understatement of poverty rates is only one-seventh, or 3 percentage points when one uses market values in lieu of equivalent cash grants.

The data used here are drawn from surveys of households conducted in the 1970s. Since then, AFDC, food stamps, and housing subsidy programs have become less generous, with lower benefit levels, higher implicit marginal tax rates, and stricter eligibility criteria. Our understanding would be deepened by studies using more current data and more current program rules.

Assuming a single utility function for all households, there is no statistically significant variation in average tastes by household composition, but there is likely to be variation within each household composition. Allowing for random utility function parameters would provide better estimates of deadweight losses.

Medicaid is the tail that wags the deadweight dog. The bulk of the inefficiency of transfers in kind is due to the large shift in medical consumption dictated by Medicaid. However, on three fronts one could wish for markedly better estimates of the true cost of Medicaid: (i) analytically, a better statement of viable alternatives whose costs could be compared to those of Medicaid would be useful, (ii) conceptually, an integration of Medicaid in a model incorporating uncertainty is needed—surely an important step in a complete analysis of an insurance program, and (iii) empirically, there are no precise estimates of the demand for insurances like Medicaid.

APPENDIX

*Equivalent Cash Grant Formula for the
Stone-Geary Utility Function*

The Stone-Geary utility function,

$$U = \pi (X_i - \theta_i)^{B_i}, \quad \sum_{i=1}^n B_i = 1,$$

yields a system of linear expenditure equations

$$P_i X_i = B_i Y + P_i \Theta_i - B_i \sum_{j=1}^n P_j \Theta_j$$

$$i=1, \dots, n$$

Consequently, the demand functions for the Stone-Geary utility function are

$$X_i = B_i(Y/P_i) + \Theta_i - B_i \sum_{j=1}^n (P_j/P_i)\Theta_j$$

$$i=1, \dots, n$$

Inserting these demand equations into the utility function, as in

$$U^* = \pi \prod_{i=1}^n [B_i(Y/P_i) - B_i \sum_{j=1}^n (P_j/P_i)\Theta_j]^{B_i}$$

yields the Stone-Geary indirect utility function

$$U^* = \pi \prod_{i=1}^n [(B_i/P_i)(Y - \sum_{j=1}^n P_j \Theta_j)]^{B_i}$$

or, since $\sum_{i=1}^n B_i = 1$,

$$U^* = (Y - \sum_{j=1}^n P_j \Theta_j) \prod_{i=1}^n (B_i/P_i)^{B_i}$$

To determine the level of income, Y^* , which would yield, at market prices P_1^m, \dots, P_n^m , the same level of utility as an arbitrary bundle of goods X_1^*, \dots, X_n^* , we replace U^* with the utility associated with X_1^*, \dots, X_n^* in the indirect utility function, and solve for income. That is,

$$\pi \prod_{i=1}^n (X_i^* - \Theta_i)^{B_i} = (Y^* - \sum_{i=1}^n P_i^m \Theta_i) \prod_{i=1}^n (B_i/P_i^m)^{B_i}$$

$$\prod_{i=1}^n [(P_i^m X_i^* - P_i^m \Theta_i)/B_i]^{B_i} = Y^* - \sum_{j=1}^n P_j^m \Theta_j$$

$$Y^* = \prod_{i=1}^n [(P_i^m X_i^* - P_i^m \Theta_i)/B_i]^{B_i} + \sum_{j=1}^n P_j^m \Theta_j$$

Hence, the grant (or tax, if negative) that must be given to a household with an initial income Y^0 to make it as well off as it would be with the bundle X_1^*, \dots, X_n^* is

$$V = \prod_{i=1}^n [(P_i^m X_i^* - P_i^m \Theta_i)/B_i]^{B_i} + \sum_{j=1}^n P_j^m \Theta_j - Y^0$$

which is eq (1) in the text

REFERENCES

Aaron, H. *Why Is Welfare So Hard to Reform?* Washington, D C: Brookings Institution, 1973

Browning, F. *Redistribution and the Welfare System* Washington, D C: American Enterprise Institute, 1975

Burtless, Gary. "Public Spending for the Poor," in *Fighting Poverty*, edited by S. Danziger and D. Weinberg. Cambridge: Harvard University Press, 1986, 18-49

Bureau of Labor Statistics. *Three Budgets for an Urban Family of Four*. Washington, D C, 1972

Clarkson, K. *Food Stamps and Nutrition*. Washington, D C: American Enterprise Institute, 1975

—. "Welfare Benefits of the Food Stamp Program." *Southern Economic Journal*, July 1976, 864-68

Coe, R. "Participation in the Food Stamp Program among the Poverty Population." Unpublished paper, University of Michigan

De Salvo, J. "Benefits and Costs of New York City's Middle-Income Housing Program." *Journal of Political Economy*, August 1975, 791-805

Fraker, T, R. Moffitt, and D. Wolf. "Effective Tax Rates and Guarantees in the AFDC Program 1967-1982." *Journal of Human Resources*, Spring 1985, 251-63

Fraker, T, B. Devaney, and E. Cavin. "An Evaluation of the Effect of Cashing Out Food Stamps on Food Expenditures." *American Economic Review* May 1986, 230-34

Friedman, J., and D. Weinberg. "Food Stamps as a Housing Program." Unpublished manuscript, Cambridge Mass: Abt Associates

Hausman, J. "An Instrumental Variable Approach to Full Information Estimators for Linear and Certain Non-Linear Econometric Models." *Econometrica*, 43(4), July 1975, 777-88

Hutchens, R. M. "Changes in AFDC Tax Rates, 1967-1971." *Journal of Human Resources*, Winter 1978, 60-74

Kennedy, S., and J. MacMillan. *Participation under Alternative Housing Allowance Programs*, Cambridge Mass: Abt Associates, 1980

- Kmenta, Jan, J Benus, and H Shapiro "The Dynamics of Household Budget Allocation to Food Expenditures" *Review of Economics and Statistics*, May 1976, 129-38
- Kraft, J, and E Olsen "The Distribution of Benefits from Public Housing," in *The Distribution of Economic Well-Being*, edited by F T Juster, New York NBER, 1977, 51-64
- Leonesio, M V "Predicting the Effects of In-Kind Transfers on Labor Supply" *Southern Economic Journal*, April 1988, 901-12
- Lurie, I ed *Integrating Income Maintenance Programs* New York Academic Press, 1975
- MacDonald, M *Food Stamps and Income Maintenance* New York Academic Press, 1977
- Manning, W, J Newhouse, N Duan, E Keller, A Liebowitz, and M Marquis "Health Insurance and the Demand for Medical Care Evidence from a Randomized Experiment" *American Economic Review*, 77(3), June 1987, 251-77
- Mayo, Stephen "Theory and Estimation in the Economics of Housing Demand" *Journal of Urban Economics*, July 1981, 95-116
- Mirer, T "Alternative Approaches to Integrating Income Transfer Programs," in *Integrating Income Maintenance Programs*, edited by I Lurie New York Academic Press, 1975, 147-60
- Moffitt, R "Estimating the Value of an In-Kind Transfer The Case of Food Stamps" *Econometrica*, March 1989, 385-409
- Moffitt, R, and S Rangarajan "The Work Incentives of AFDC Tax Rates" *Journal of Human Resources*, Winter 1991, 165-79
- Murray, M P "The Distribution of Direct Tenant Benefits from Public Housing" *Econometrica*, July 1975, 771-88
- _____"Vertical Equity in In-Kind Transfer Programs" *Southern Economic Journal*, April 1977, 1604-07
- _____"A Reinterpretation of the Traditional Income Leisure Model and Its Application to Subsidy Programs" *Journal of Public Economics*, January 1980a, 69-81
- _____"Tenant Benefits in Alternative Federal Housing Programs" *Urban Studies*, February 1980b, 25-34
- _____"Real Versus Monetary Transfers Lessons from the American Experience," in *Public Transfers and Some Private Alternatives During the Recession*, edited by M Pfaff Berlin Duncker and Hunblot, 1983, 105-23
- Neary, J, and K Roberts "The Theory of Household Behavior under Rationing" *European Economic Review*, January 1980, 25-42
- Newhouse, J, and C Phelps "Price and Income Elasticities for Medical Care Services," in *The Economics of Health and Medical Care*, edited by M Perlman New York Wiley, 1974, 287-313
- Nichols, J, and R Zeckhauser "Targeting Transfers through Restrictions on Recipients" *American Economic Review*, May 1982, 372-77
- Olsen, E, and D Barton "The Benefits and Costs of Public Housing in New York City" *Journal of Public Economics*, May 1983, 299-332
- Phlips, L *Applied Consumption Analysis* Amsterdam North-Holland, 1974
- Ross, T W "On the Relative Efficiency of Cash Transfers and Subsidies" *Economic Inquiry*, July 1991, 485-96
- Smeeding, T "The Antipoverty Effectiveness of In-Kind Transfers" *Journal of Human Resources*, Summer 1977, 360-78
- _____"The Trend toward Equality in the Distribution of Net Income A Reexamination of Data and Methodology" Undated mimeo, University of Utah
- Smolensky, E, et al "Adding In-Kind Transfers to the Personal Income and Outlay Accounts Implications for the Size Distribution of Income" Working paper, University of Wisconsin, Institute for Research on Poverty, 1974
- Smith, R T *Welfare Reform and Housing Assistance* Santa Monica The RAND Corporation, R-2333-HUD, September 1979
- Weinberg, D A "Filling the 'Poverty Gap' Multiple Transfer Program Participation" *Journal of Human Resources*, Winter 1985, 64-89
- Yeas, M "An Introduction to the Income Survey Development Program," in *Survey of Income and Program Participation The Conference on Potential for Analysis*, edited by C Lininger Annandale, Va JWK International, 1979, 50-80