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4 Approaches to Measuring and Valuing In-Kind Subsidies and the Distribution of Their Benefits

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4.1 Introduction

In recent years much attention has been focused on public in-kind subsidies for food, education, medical care, and housing. While the majority of past efforts have dealt with in-kind transfers, recent attention has been drawn to other types of public subsidies for similar commodities (e.g., tax expenditures for employer-provided medical care and for home mortgage interest deductions). Often the value of these non-means-tested in-kind subsidies dwarf the more readily available and noticeable value of means-tested in-kind transfers. For instance, the market value of means-tested in-kind transfers for rented public housing in 1980 was $5.0 billion as compared to $20.8 billion in tax deductions for mortgage interest and property taxes, and foregone revenues from tax-exempt bonds to finance mortgages (Smeeding 1982, table A-1).

In response to criticisms of the increasingly limited value of money income statistics, the U.S. Bureau of the Census began in 1980 to collect data on recipiency of several types of in-kind subsidies: major in-kind transfer benefits and employer-provided, tax-subsidized health and pen-

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sion benefits (U.S. Bureau of the Census 1981). Further, the 1978 and 1979 Income Survey Development Program (ISDP) research panels for the planned Survey of Income and Program Participation (SIPP) extended these efforts to cover government-subsidized mortgages, tax-free employer-provided subsidies, and income tax information (see Manser 1981; 1982). However, while surveys can fairly easily assess noncash benefit recipiency, subject to sampling and nonsampling error, the measurement and valuation of these benefits are much more problematic. Researchers in this area should be quick to discover that no one measure of the value of in-kind benefits is adequate for all uses of such data. Rather, depending on the purposes to which the data will be put, different approaches to measuring and valuing in-kind subsidies will be appropriate.

This paper proposes a set of conceptual approaches for measuring and valuing in-kind subsidies for budgetary purposes and for distributing their benefits to recipients and nonrecipients. Section 4.2 presents a set of alternative measures of the value of public in-kind subsidies which, for purposes of this paper, are defined below. Although this analysis could be extended to include nonpublic in-kind subsidies (e.g., employer-provided meals, housing, and free transportation; or private charitable provision of food and shelter), we will concentrate only on public sector in-kind subsidies. Section 4.3 illustrates the use of these various approaches by providing alternative estimates of the efficiency of government-provided subsidies and estimates of the size distribution of in-kind benefits for a selected set of medical care and housing subsidies in 1979. Section 4.4 summarizes the results of the paper and the implications of these measures for social accounting for public in-kind subsidies.

This paper will consider both direct and indirect public in-kind subsidies. Direct public in-kind subsidies, or in-kind transfers, are defined as publicly provided benefits in the form of goods and services of a private good nature which are received without fully reciprocal quid pro quo provision of goods or services by the recipient. These direct subsidies include traditional types of means-tested in-kind transfers, such as Medicaid or public housing, and also direct subsidies such as FHA, FHMA, and VA mortgage interest subsidies for home ownership. Indirect in-kind subsidies take the form of tax expenditures that reduce the market price of specific private goods or services by exclusion from tax, by deduction from the tax base, or by tax credit. While these subsidies do not directly enter government budgetary accounts as expenditures, they can generally be thought of as alternatives to direct subsidy programs of equal dollar cost, despite practical differences that may lead Congress to choose indirect subsidies over direct subsidies, or vice versa (Congressional Budget Office 1981). For purposes of this paper, the important point is the realization that a certain amount of foregone tax revenue has the

same effect on government budgets as an equal-cost direct expenditure. In accounting for the budgetary cost and distributional effects of public in-kind subsidies both direct and indirect subsidies need to be explicitly recognized.

4.2 Conceptual Approaches to Measuring and Valuing In-Kind Subsidies

Researchers and policymakers need to realize that no single measure of the value of in-kind subsidies is adequate for all uses. Strategies for valuing in-kind benefits depend on how the data will be used. Unfortunately many research studies have not established the conceptual basis for their approach to measuring and valuing in-kind benefits, despite the fact that use of inappropriate measures of value may lead to incorrect conclusions concerning their efficiency cost or distributional effect, and thus to incorrect policy decisions.

Before examining each valuation technique in detail, it is useful to understand the major conceptual differences between them and their general relationship to one another. Market value is the private market cost of the goods and services transferred to the recipient net of any required recipient payment. Government cost is the total delivery cost of these goods, which may be provided by government at, below, or above their private market value. If government cost falls below market value, efficiency benefits accrue from government production of the good or service being transferred. On the other hand, if government cost exceeds market value the efficiency costs are borne by the taxpayer. These differences are important in determining whether the government should actually produce a given good, or whether they should merely provide the good by means of subsidizing private market consumption. The social benefit value to recipients and taxpayers must be at least as large as the government cost if the provision of a given benefit is to be efficient in an economic sense.[1]

While market value, government cost, and social benefit value are essentially valuation concepts related to economic efficiency, other measures of value are preferred for assessing the distributional impact of in-kind subsidies. For instance, recipient or cash equivalent value is the cash amount for which recipients would be willing to trade their right to the in-kind subsidy given their current incomes (including cash and other in-kind subsidies). In general, the cash equivalent value is no more than the market value of the in-kind benefit and is the proper concept for measuring the distributional impact of in-kind subsidies on beneficiaries incomes and well-being.

For distributional purposes, the aggregate difference between the social benefit value of an in-kind subsidy and the cost of a cash transfer

program, with total recipient benefits equal to the cash equivalent value of the in-kind subsidy, serves as an upper-bound measure of nonrecipient benefits. Because we cannot estimate social benefit value, these nonrecipient benefits are approximated by the extra government cost involved in providing in-kind transfers instead of lesser amounts of cash transfer which would have the same welfare value to recipients. Several potential types of nonrecipient benefits will be mentioned, and their aggregate value will be distributed among taxpayers. A framework similar in part to this one has been previously suggested for public housing programs (DeSalvo 1971), though no actual estimates of value were presented and nonhousing programs were not considered. The remainder of this section discusses these different concepts of value with reference to housing and medical care subsidies.

4.2.1 Market Value

The market value of an in-kind transfer is equal to the private market cost or the purchasing power of benefits received by the individual. In-kind transfers present beneficiaries with control over some amount of economic resources that usually can be bought and thus have been explicitly valued in the private market. Because market value is intuitively appealing to economists and relatively easy to estimate in many cases, it is the measure most often used in studies of the value and distribution of in-kind transfer benefits. In some cases (e.g., food stamps) the market value is directly measurable as the dollar value of food coupons in the market.

In other cases, however, market value must be estimated. For instance, the market value of medical care transfers (e.g., Medicare) as medical insurance can be estimated as the sum of vendor payments net of beneficiary charges (e.g., the Medicare supplemental medical insurance premium), plus private sector claims-processing cost, plus selling costs. In the case of public housing transfers the conceptual measure of market value is easily defined as the difference between the private market rental value of the unit and the rent actually paid by public housing tenants. Estimating market value for public housing becomes problematic because the private market rental value is not known.

The market value of indirect subsidies from exclusion of employer-provided benefits is the income and payroll tax savings (i.e., the dollar value of untaxed income times the appropriate marginal federal income and payroll tax rate). In the area of health care two types of indirect subsidies may be noted: the tax exclusion of employer-paid health insurance premiums, and the tax deductibility of the first $150 of direct health insurance expenses, plus out-of-pocket expenses in excess of 3 percent of adjusted gross income. Indirect tax subsidies for housing primarily benefit home owners in the form of mortgage interest and property tax

deductions, deferral of capital gains on home sales, and the exclusion of the first $125,000 of capital gain for qualifying elderly home owners.

When measuring the market value of indirect tax subsidies it may be important to realize that estimates are based on current lost tax revenues and do not account for the behavioral response of taxpayers to changes in the amount or form of the subsidy. For instance, Ginsburg (1981a, p. 8) has predicted that full taxation of employer-provided health insurance might decrease the proportion of medical expenses covered by insurance (and thus we assume health insurance purchases) by 25 percent. As long as the 25 percent decline in health insurance purchases are not deferred to other nontaxable forms of compensation (e.g., pension plan contributions), the estimated market value of the tax subsidy and its budgetary effects will not differ considerably. However in the case of housing subsidies, removal or limitation of mortgage interest tax deductibility may lead to windfall capital losses for home owners and thus may substantially affect capital gains tax revenues. In estimating both the market value and government cost of indirect housing and medical subsidies we do not account for the effects of behavioral response.

The market value concept is sometimes used for program budgeting by administering agencies and, in some cases, by the Congressional Budget Office. In situations where overhead costs can be assumed not to vary with the proposed program adjustment, changes in market value can be an accurate predictor of the net change in government or budgetary cost. However, in cases where government cost and market value vary significantly the government cost measure should be used to estimate the budgetary impacts of program changes. Market value has also been used, though, as we will argue below, incorrectly, in studies of the distributional impact of in-kind programs and their effect on poverty status (Congressional Budget Office 1977; Hoagland 1980; Paglin 1980; Browning 1976).

4.2.2 Government Cost

To measure the net budgetary impact of a proposed change in an in-kind subsidy program, or to compare the economic efficiency of public sector provision vs. public sector production of an in-kind subsidy, a measure of the total government cost of producing (or providing) the given benefit is required. Government cost includes the dollar cost of benefits provided plus all of the associated economic costs of production (or provision) and program management.[2] Government cost is net of recipient contributions to the program, should there be any. Because, as generally calculated, it includes all direct costs of providing a given benefit, government cost is normally the proper measure to determine net changes in budget outlays resulting from a given change in program rules and regulations. For instance, in the case of indirect tax subsidiza-

tion, the government cost is simply the market value of the subsidy—the foregone tax revenue plus the administrative-processing and enforcement costs associated with the additional tax preference provisions.

Government cost may also be compared to the market value of in-kind subsidies to determine the net efficiency cost or efficiency benefits from the form in which the transfer is provided. For instance, consider the Medicare program wherein government is the producer as well as the provider of health insurance coverage. The government cost is the cost of vendor payments plus claims-processing and enforcement costs. Suppose that, as has been recently suggested, the delivery mechanism for Medicare was changed to an equal outlay voucher system whereby the government provided beneficiaries with a voucher which could be used to purchase private health insurance (Ginsburg 1981b). Unfortunately such a change would not be cost efficient. Private insurance carriers typically have high selling and marketing costs, or load factors, which would be reflected in premiums charged Medicare voucher holders. Because Medicare avoids these selling and marketing costs, and because of comparable claims-processing costs for government and private insurers, fewer benefits in terms of covered medical services could be purchased through the private sector with equal cost vouchers for all beneficiaries, as compared to the current Medicare program. Based on this discussion, the government cost of the Medicare program appears to be below the private market value of the medical care benefits provided by the program. If this is so, efficiency benefits are being realized from the current method of Medicare health insurance provision. Changing to an alternative form of benefit provision, such as a voucher plan, would probably increase government cost to the private market value of benefits being provided.[3]

On the other hand, current public housing programs have been criticized because of their high cost in excess of the market value of housing benefits provided (Rydell, Mulford, and Helbers 1980; Weinberg 1982). Recent analysis of the Experimental Housing Allowance Program (EHAP) whereby tenant beneficiaries received vouchers for a specified portion of their rent indicates far lower cost for equivalent market value housing benefits (Rydell, Mulford, and Helbers 1980). These findings suggest that changing the form of public housing subsidies could substantially reduce the government cost of providing housing benefits by reducing the attendant efficiency costs associated with current program designs.

4.2.3 Social Benefit Value

The social benefit value of a public transfer program must be at least as great as the government cost to justify the program. The social benefit value should include spillover effects (consumption and production externalities) and other efficiency and equity benefits accruing to taxpayers

who finance the program, as well as benefits to the program recipient net of recipient charges. Social benefit values will not be presented in this paper because of difficulties in estimating their dollar value. However most social benefit values from in-kind transfers take the form of nonrecipient benefits, which are discussed below.

The market value, government cost, and social benefit value concepts are useful in determining the efficiency of government-provided in-kind subsidies and their budgetary impact. They are less well suited for assessing the distributional effects of in-kind subsidies, where measures of recipient (cash equivalent) value and nonrecipient value are preferable.

4.2.4 Recipient or Cash Equivalent Value

If in-kind subsidies distort consumption patterns, they add less to a recipient's economic well-being than an equal-dollar-cost cash subsidy. If so, they should be discounted to their recipient value to reflect this fact. If consumption patterns are not distorted by the in-kind transfer, the recipient value and market value of the subsidy will be equal.[4] Only in this case is market value an acceptable substitute for recipient value when measuring the distributive effect of recipient benefits from in-kind subsidies. Recipient value reflects the program beneficiary's own valuation of the benefit and can be measured by the amount of cash transfer that would make the recipient just as well-off as the in-kind transfer. The recipient value is also known as the cash equivalent value and is formally termed the "Hicksian equivalent variation" after Sir John Hicks (1943). Most economists agree that cash equivalent value is the proper measure for valuing in-kind transfers to evaluate their impact on economic well-being and the income size distribution because it translates the market value of goods into cash values conceptually equivalent to the money incomes to which they are added (Smeeding and Moon 1980; Smeeding 1982).

In theory, the recipient or cash equivalent value can be estimated by assigning a utility function to subsidy recipients. The cash equivalent value measure is the amount of cash subsidy that would leave the recipient at the same level of well-being or utility as the market value of the in-kind transfer. However, because utility functions cannot be observed and measured with any degree of accuracy, and because of difficulties with current consumption data, a simplified measure of recipient value, which is explained in section 4.3.2, has been developed as a substitute.

While the recipient value of indirect in-kind subsidies are conceptually no different than those for direct subsidies, cash equivalent values for indirect in-kind subsidies have not yet been estimated. A major problem with estimating cash equivalent value for both direct and indirect subsidies is the absence of a relevant counterfactual. For instance, in estimating the cash equivalent value of the tax exclusion for employer-provided health insurance it is necessary to observe individual purchases of health

insurance by similar persons in the absence of tax advantages. While it may be possible to infer such values from estimates of the price elasticity of demand for medical insurance, we are not able to observe the health insurance purchases of a group of unsubsidized individuals similar to those who now benefit from the tax advantages of employer-provided health benefits. Thus, while cash equivalent value is conceptually preferable to other measures of in-kind transfer value in assessing the distributional impact of in-kind subsidies, it is not easily or accurately estimated in many cases.

4.2.5 Nonrecipient Benefits

In most cases of in-kind transfer, particularly in the case of medical care benefits, the cash equivalent value of in-kind subsidies is less than both the market value and government cost of the in-kind benefit (Smolensky et al. 1977; Cooper and Katz 1978; Smeeding 1982). Because transfer recipients could therefore be made just as well-off with a lower-cost cash subsidy, nonrecipient taxpayers and policymakers must also receive some of the benefits from in-kind subsidies. In allocating this portion of the benefits from in-kind transfers we would ideally want to distribute the difference between the social benefit value of the in-kind subsidy and the cost of a cash transfer program, with benefits equal to the recipient value of the in-kind program, to nonrecipient beneficiaries. However, because social benefit value is not easily estimated, we assume that total benefits are at least as great as the government cost of in-kind subsidies. We can then derive a lower-bound estimate of nonrecipient benefits by taking the difference between government cost and the lower-cost cash transfer which leaves beneficiaries just as well-off as the in-kind program.[5]

Recent research suggests a number of efficiency and equity benefits that one might want to count in measuring the value of nonrecipient benefits. For instance, in addition to production and consumption externalities, and the paternalism of "donor benefits" (Hochman and Rodgers 1969; Thurow 1974), in-kind subsidies may have additional efficiency advantages over an equal-cost cash transfer program. For instance, Krashinsky (1980) and Nichols and Zeckhauser (1981) argue that the "target efficiency" (Weisbrod 1969) of subsidy programs is greatly improved by imposing restrictions on the choices made by the intended beneficiaries. Murray (1981) has shown that means-tested in-kind transfers lead to a smaller labor supply reduction than an equal-cost cash transfer. In fact, certain types of in-kind transfers, such as work training subsidies or subsidized day care, may actually increase labor supply relative to an equal-cost cash transfer program. In addition, worker training subsidies and child health and nutrition programs, such as the Maternal and Child Health Care Program and the Women, Infants, and

Children Nutrition Program, may have long-term health-related investment benefits to both the individuals and society that would not be realized by an equal-cost cash transfer (Garfinkel and Smeeding 1981).

In addition to these efficiency benefits, in-kind subsidies may have equity benefits (even more difficult to value). For instance, in-kind benefits in the form of subsidized education or health care may enhance equality of opportunity to a greater extent than an equal-cost cash transfer. Equity arguments for guaranteed minimum availability of certain merit goods (such as health care) can also be made (Tobin 1970; Musgrave 1959), as can arguments for social risk sharing (tax subsidies for those experiencing catastrophic medical expenses, or Medicare coverage of renal dialysis).

Having argued for the existence of nonrecipient benefits, we need to decide who the nonrecipient beneficiaries are. In general, we will argue that all taxpayers receive nonrecipient benefits in proportion to federal income tax payments. In this sense nonrecipient benefits can be treated as a public good.[6]

However, a case can be made that specific types of in-kind transfers benefit particular individuals who in the absence of the in-kind transfer would have provided a similar benefit to the in-kind subsidy recipient. For instance, take the case of Medicaid-financed nursing home expenditures. Because of attendant program rules and regulations, Medicaid nursing home beneficiaries receive little if any net welfare gain from qualifying for these benefits (Smeeding 1982, pp. 53–56). If it can be argued that most such direct beneficiaries are no better-off in an economic sense with the transfer than without it, who benefits from these expenses? It can be argued that Medicaid nursing home benefits protect taxpayers against the direct monetary costs and indirect opportunity costs of looking after aged or disabled relatives who need constant care and attention. On the one hand, all taxpayers are protected against this eventuality should it ever arise. Thus an argument for the public good approach can be made. On the other hand, in any given period specific taxpayers (sons, daughters, other relatives) who would have otherwise paid for these services become "secondary beneficiaries" (Lampman and Smeeding 1982). But because of lack of information on specific secondary beneficiaries, we will not be able to allocate relevant types of nonrecipient benefits to such individuals.

4.3 Applications and Examples

We are not able to provide estimates of either the efficiency measures or the distributional measures of the value of all types of in-kind subsidies. However, we can provide some rough estimates of the effect of the proposed measures of value on both program efficiency comparisons and

Table 4.1 **The Current Government Cost and Alternative Government Cost of Medicare and Public Rental Housing in 1980 ($ billions)**

Program/ Choice of Delivery Mechanism	Current Government Cost				Alternative Government Cost				Government Cost vs. Alternative Cost	
			Overhead and Administration:				Overhead and Administration:		Difference in Overhead and Administration:	
	Total	Value of Benefits[a]	Dollar Cost	(as % of benefits)	Total	Value of Benefits[a]	Dollar Cost	(as % of benefits)	Dollar Cost	(as % of benefits)
A. Medicare										
1. Current program	$29.356	$28.391	$ .965	(3.4)						
2. Voucher program:					$37.382[b]	$28.391	$ 8.991	(31.7)	$ −8.026	(−28.3)
High estimate					46.306	28.391	17.915	(63.1)	−16.950	(−59.7)
Medium estimate					34.041	28.391	5.650	(19.9)	−4.685	(−16.5)
Low estimate					31.798	28.391	3.407	(12.0)	−2.442	(−8.6)
B. Public housing										
1. Current programs										
Low-rent public housing	3.126	2.039	1.087	(53.3)						
Rent supplement	.382	.258	.124	(48.1)[c]						
Section 236	1.017	.709	.308	(43.5)						
Section 8 (new)	1.297	.860	.437	(50.8)						
Section 8 (existing)	1.767	1.220	.547	(44.8)						
Total	$7.589	$5.086	$2.503	(49.2)						
2. Voucher program:					5.888[b]	5.086	.802	(15.8)	1.701	(33.4)
High estimate					6.064	5.086	.978	(19.2)	1.525	(30.0)
Low estimate					5.712	5.086	.626	(12.3)	1.877	(36.9)

the distribution of program benefits for a selected set of medical care and housing benefits.

4.3.1 Efficiency Measures

In determining the net budgetary impact of a particular in-kind subsidy, and in estimating the efficiency costs of government production vs. government provision of benefits, both the market value and government cost measures are important. In table 4.1 we have calculated the government cost of both Medicare and public housing as currently designed and the alternative cost of a voucher program that provides the same total value of benefits to recipients.[7] The differences between overhead and administration under the current government cost and the alternative government cost options (in the final two columns of table 4.1) measure the net costs (if negative) or benefits (if positive) of changing the existing program delivery mechanism to a voucher program.

In the current Medicare program (table 4.1, part A) overhead and administration charges for claims processing averaged 3.4 percent of benefits (or claims) in 1979 (U.S. Department of Health and Human Services 1980). The costs of a change to a voucher system has been estimated in three ways. First, the high estimate is based on total expenses as a percent of claims for a sample of large and medium private insurance carriers providing a comprehensive major medical insurance policy to an employer with one employee in 1978 (Thexton 1978). While total insurance premiums for the elderly will differ from that of employees, the majority of the expenses of providing the policy, or the "load factor," should be quite similar. Of the total load factor of 63.1 percent,

Notes to Table 4.1

SOURCES: Medicare, current program: *Social Security Bulletin* (1982), table M-2; U.S. Department of Health and Human Services (1980).

Medicare, voucher program: Thexton (1978); Schuttinga (1981); Ginsburg (1981b).

Public housing, current programs: benefit values: Doyle et al. 1980; overhead and administration: low-rent public housing: Morrall and Olsen (1980); U.S. Department of Housing and Urban Development (1974); Section 236: Mayo et al. (1980); Murray (1980); Section 8 (new): Mayo et al. (1980); Weinberg (1982); Section 8 (existing): Rydell, Mulford, and Helbers (1980).

Public housing, voucher program: Rydell, Mulford, and Helbers (1980); U.S. Department of Housing and Urban Development (1979).

[a]Value of benefits are net of beneficiary contributions. These include the supplementary medical insurance premium in Medicare and the subsidized rental payment by public housing beneficiaries. Value of benefits in the Medicare program are measured by vendor payments, and in public housing programs by the difference between the private market rental value and the subsidized rent.

[b]Alternative cost is the simple average of the high, low, and medium estimates from the voucher programs in the Medicare case; and then high and low estimates in the public housing case.

[c]Overhead and administration for the rent supplement program is the simple average of all other overhead and administration charges.

3.8 percent covers state insurance premium taxes, 25.5 percent goes to direct sales overhead and commissions, 5.5 percent for claims processing, and 28.3 percent "other," which includes all remaining expenses of marketing and sales promotion, experience rating individuals, and profits.

It should be recognized that significant economies of scale in total overhead expenses exist. For instance, if a local senior citizens group endorses a plan with fifty participants, expense charges fall to 19.9 percent of claims (as shown under the medium estimate). Thus the high estimate assumes that all Medicare voucher holders would enroll with private insurers and that none of the advantages of economies of scale in overhead expenses would be developed through group sales. The medium estimate is based on the assumption that all Medicare voucher holders enroll with private insurers, but that groups of fifty enrollees are formed so that economy of scale advantages would be realized. Larger (smaller) groups would experience lower (higher) overall expenses. For instance, groups of 500 (5) would experience total load factors of 9.8 (46.8) percent of claims (Thexton 1978).

The low estimate is based on Blue Cross/Blue Shield (BC/BS) load factors (Schuttinga 1981) for single policies. They are lower than the private insurance company expenses for several reasons. First of all, BC/BS offers larger numbers of comprehensive health insurance policies than supplemental policies which have a higher ratio of load factor to claims. Secondly, BC/BS is a nonprofit company which in most states avoids the state insurance premium tax. Finally, there is some evidence that BC/BS cross-subsidizes single individuals at the expense of larger groups (Schuttinga 1981).

The overall total cost is the simple average of the alternative cost options, implicitly assuming that some voucher holders will end up in each of the three alternative scenarios. The fact that all three scenarios currently exist despite the large differences in overhead costs apparent in table 4.1 justifies this averaging technique. The result of this comparison indicates that a Medicare voucher plan would likely have cost the U.S. taxpayer an additional $8.0 billion, or 28.3 percent of vendor payments (claims) in 1980. These comparisons indicate that the current Medicare delivery system, which benefits from large economies of scale in claims processing, and which avoids the marketing, selling, and other costs associated with private insurance carriers, confers substantial efficiency benefits to taxpayers when compared to the alternative cost (or market value) of an equal benefit voucher plan.

In the case of public housing (table 4.1, part B) we find the opposite conclusions. The net market value of public housing benefits is equal to market rent minus the tenant contribution (or subsidized rent). This value has been estimated to be $5.086 billion in 1980 by the Congressional

Budget Office (Doyle et al 1980, p. 241) Various authors (see sources to table 4.1) have estimated the overhead or delivery cost per dollar of housing services. These costs have been expressed as a percent of benefit value, which differs from the value of housing services by the amount of the tenant contribution. Depending on the specific housing program in question, these expenses averaged 49.2 percent of benefits and include such items as construction costs and FHA loan subsidies for public housing construction, program-induced increases in rent, and the costs of administering the program (payments processing, eligibility recertification, periodic reinspection of public housing units to ensure code compliance, and other participant services). The difference between the market value of benefits delivered by public housing programs and the total government cost of these programs is quite large, totaling over $2.5 billion in 1980. Administrative costs and overhead for public housing are far above the administrative costs for other in-kind programs.[8]

The alternative costs of the voucher program were derived from EHAP (U.S. Department of Housing and Urban Development 1979). Under EHAP tenants received vouchers for the difference between the estimated standard cost of adequate housing (or the fair market rent) and 25 percent of their adjusted household income. Beneficiaries were then free to use this voucher to rent any dwelling that meets code requirements in the local area. EHAP was actually three different housing experiments, two of which (the Supply Experiment [SE], which was designed to determine the effects of vouchers on local housing markets; and the Administrative Agency Experiments [AAE], which were designed to gather information on the costs of delivering housing allowances) are used to obtain the alternative cost estimate in table 4.1.

The SE indicates that because the housing allowance voucher plan subsidizes housing demand in a local area, these areas experienced a 1.2 percent short-run increase in rental housing prices. This translates into a 1.5 percent increase in program costs relative to the net value of benefits (total rent minus a tenant contribution of roughly 30 percent of total rent). Additional overhead costs derived from both the SE and the AAE programs are added to this amount. The high cost estimate of $256 per unit per year or 17.8 percent of net benefits in table 4.1 is taken from the AAE experiments, while the low cost estimate, $156 or 10.8 percent of net benefits, is taken from the SE experiment (U.S. Department of Housing and Urban Development 1979, table V-1). The SE costs fall below the AAE costs because of economies of scale. Each site participating in the AAE experiments, had no more than 900 households, while each of the SE sites served at least 3500 households. The implication of these estimates is that combining the best features of the AAE experiments with the economies of scale experienced in the SE experiment (which are liable to be even greater in a nationwide program) might lead

to administrative costs below those found in the low estimate in table 4.1. However, conservatively assuming that not all such economies would be realized, we have avaraged these estimates to derive the overall government cost of a voucher program with benefit values equal to those paid under current public housing programs. Comparing the voucher estimates with the current system, we find that the net efficiency costs from the current public housing system are estimated to be $1.7 billion or 33.4 percent of the market value of benefits received by public housing tenants.

Some care must be taken in interpreting these figures. Because of existing public housing program commitments, such as contracts promising to maintain subsidies for thirty years in the section 8 program (Congressional Budget Office 1979), and because of government-owned public housing complexes, the costs of changing the current phalanx of housing programs into a voucher system may be prohibitive. However, the estimates in table 4.1 do indicate that future low-income rental housing programs of the EHAP voucher type should be much more cost effective than additional units provided under current housing programs.

4.3.2 Distributional Implications

Measures of the value of in-kind subsidies are crucial in determining their distributional impact. Often public policy focuses only on means-tested direct subsidies or in-kind transfers because of their rapid growth and impact on the poverty status of low-income households (Paglin 1980; Smeeding 1982). For instance, the market value of means-tested benefits in the form of Medicaid and public housing have increased from $7.2 billion in 1970 to $31.6 billion in 1980 (Smeeding 1982, table 1). Indeed Medicaid, with vendor payments of $26.2 billion in 1980, is our largest means-tested transfer benefit, far outweighing *all* means-tested cash transfer benefits combined ($18.9 billion in 1980). In contrast, little attention has been focused on the distributional effects of conceptually similar indirect subsidies for health care or housing. In fact, only once in recent years has the Treasury Department even published estimates of the (market) value of tax expenditures by income class (U.S. Department of the Treasury 1978).

The distributional impact of direct in-kind subsidies is most often presented in terms of their market value with little attention focused on recipient value (e.g., Browning 1976; Congressional Budget Office 1977; Hoagland 1980). However, if one accepts the argument that recipient value is the proper conceptual approach for measuring the distributional impact of in-kind subsidies, and if reasonable measures of recipient value can be estimated, the distributional impact of in-kind subsidies is quite different from that observed when using the conventional market value approach. Moreover, accepting the concept of recipient value, and given

the rapidly growing literature on the efficiency advantages of in-kind transfers, one is led to the notion of nonrecipient benefits and their distribution.

In this section of the paper we examine the mean value and size distribution of a subset of both direct and indirect in-kind subsidies for medical care and housing, comparing the results of conventional measures of their value to the conceptual approaches suggested above. A brief explanation of the derivation of these estimates precedes the analysis.

The government cost and market value of direct in-kind subsidies have recently been estimated by Smeeding (1982). Medical care benefits from Medicare and Medicaid are treated as insurance benefits accruing to the entire covered population according to broad beneficiary risk class (aged, disabled, adult, child). The government cost of these benefits as insurance is equal to total vendor payments plus claims-processing costs per state and risk-class specific recipient. In effect this approach measures the price that the government would have to charge beneficiaries for insurance coverage to just break even. In the past, this measure has often been confused with treating the market value of medical benefits as insurance (e.g., Hoagland 1980; Smeeding and Moon 1980; Smeeding 1982).[9] However, as demonstrated in section 4.2, the private market value (or market cost) of insurance with vendor payments equal to those of Medicare (or, we assume, Medicaid) are estimated to be 28.3 percent more than the government cost. Both measures have been calculated from the March 1980 Current Population Survey (CPS) and are presented below.

The market value of public housing was estimated using a hedonic regression model employing the Annual Housing Survey (AHS) to determine the private market rental value of public housing based purely on the characteristics (quantity and quality) and location of the housing unit. Subtracting the reported rents paid by public housing beneficiaries (as reported in the AHS) from these estimates of market rent, we arrive at the market value of the subsidy. Because the government cost of public housing has not been confused with market value, we present no distributional estimates of the government cost of public housing.

Recipient or cash equivalent value is estimated by assuming that the recipient value of an in-kind transfer is equal to the normal expenditure on that item by unsubsidized consumer units. This procedure involved matching subsidized units to unsubsidized units with similar characteristics (income, size, location, and age). If this similar nonrecipient normally spent less than the market value of the in-kind benefit on the subsidized good, the recipient value was measured by the level of normal expenditures. If normal expenditures exceed market value, recipient value equals market value. That is, because the in-kind transfer recipient would normally spend at least as much as the market value of the transfer

on the subsidized good, it is not restrictive and therefore has the same income value as a cash transfer with equal dollar benefits (Smeeding 1982). This method of estimating recipient value does not explicitly employ utility functions. However, given the current state of the art in estimating cash equivalent value using empirical utility functions, it has been suggested that the normal expenditure approach is preferable to such methods (Manser 1982).

Nonrecipient value is measured by subtracting the government cost of a cash transfer program, with benefits equal to the aggregate recipient value of the in-kind subsidy, from the government cost of the given medical care or housing transfer. Overhead costs of the cash transfer program are estimated to be 4.5 percent of benefits, roughly the administrative costs in the current Supplemental Security Income (SSI) program and in the Seattle-New Jersey Negative Income Tax Experiment. The market value of nonrecipient benefits is distributed by money income decile in proportion to federal personal income tax payments.

Recipient value for indirect subsidies has not been calculated and cannot be derived from the recipient value estimates for direct in-kind subsidies. Even if we were able to estimate recipient value, the nonrecipient value of tax subsidy benefits would be distributed to all taxpayers in a fashion similar to the distribution of the market value of recipient benefits. And so total recipient plus nonrecipient value for these benefits would be roughly equivalent to the distribution of their market value, which is shown in tables 4.2–4.6.

Nonrecipient value and the market value of indirect subsidies were distributed using information from several sources. Of primary importance is a recent document (U.S. Department of the Treasury 1981) which presents information on federal personal income tax payments by adjusted gross income class. Using CPS estimates of money income transfers by money income decile, and assuming one tax return per CPS household at higher income levels, we estimated the distribution of taxes by CPS money income decile.[10] While the resulting distribution is only a rough estimate of the true distribution of federal income tax liability by money income decile, it is quite similar to that found in other studies (e.g., Okner 1980). These taxes were then subtracted from money income to arrive at the "post-tax" money income distribution in tables 4.3 and 4.5. Data from this source were also used to allocate indirect subsidies for personal health care deductions (in proportion to taxes paid by itemized tax returns claiming these deductions) and for property tax and mortgage interest deductions (also in proportion to taxes paid by itemized returns claiming these deductions).

Tax subsidies for employer-provided health insurance and sickness/accident insurance were calculated directly from a March 1980 CPS data tape estimating the cost of employer-provided health insurance and

marginal federal income tax and payroll tax rates (Smeeding 1981). The overall, average, marginal federal personal income and payroll tax subsidy was calculated to be roughly 36 percent of the employer contribution and was directly distributed by CPS money income decile.

Because a prorich pattern of benefits is most likely disequalizing, we will refer to patterns of mean benefits increasing by income decile as regressive. The inverse of this logic indicates that a propoor, mean benefit pattern is progressive. When referring to the size distribution of aggregate benefits, those which have a greater (lesser) share of total program subsidies for the lower income decile than their after-tax money income share of 1.5 percent are termed equalizing (disequalizing). Again the inverse applies to the share of benefits for the highest decile, which receives 24.5 percent of after-tax income.

4.3.3 Medical Care Subsidies

The distributional impact of a subset of medical care subsidies is presented in tables 4.2 and 4.3. Both the mean value of benefits per beneficiary (table 4.2) and the size distribution of subsidies (table 4.3) have been calculated by CPS money income decile for 1979. The size distribution of CPS money income minus personal income taxes is also presented in the first row of table 4.3. Each table presents various measures of both direct (part A) and indirect (part B) subsidies. In part C of table 4.3 we have aggregated direct, indirect, and total subsidies to determine their net impact on the after-tax income size distribution.

Direct subsidies in tables 4.2 and 4.3 include only Medicaid and Medicare. Roughly $14.3 billion in outlays for veteran's medical care, CHAMPUS (military health care), worker's compensation, maternal and child health care, and Indian health programs are omitted (Health Insurance Institute 1980; *Social Security Bulletin* 1982). Roughly 40 percent of these benefits accrue to military living on base and to the institutionalized who are not covered in the CPS. Indirect subsidies exclude $1.3 billion in tax deductible charitable contributions for health (Congressional Budget Office 1981). These omissions should not have a great effect on the net distribution of the $68.9 billion in subsidies which are included in table 4.3.

The first two rows of table 4.2 present estimates of mean government cost and market value of direct medical subsidies. Our government cost estimate has been termed the "market value" in most studies (Hoagland 1980; Smeeding 1982). Our estimate of market value exceeds this estimate by 28.3 percent in each decile (as estimated in table 4.1). Mean benefits to the 22.7 million recipient households are fairly even across the income distribution. On the other hand, recipient value in row 3 rises with income, reflecting increased willingness to pay for medical care at higher income levels. "Benefit weights" (Smolensky et al. 1977), the ratio

Table 4.2 **Distributional Impact of Medical Care Subsidies by Household Money Income Decile: Mean Value per Recipient Household in 1979**

Row	Benefit Measures and Type	Overall Mean Value[a]	Money Income Decile									
			Lowest	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Highest
A. Direct subsidies (Medicare and Medicaid)												
1.	Government cost	$1760	$1514	$1784	$1915	$1924	$1852	$1797	$1800	$1741	$1763	$1503
2.	Market value	2258	1942	2289	2457	2468	2376	2306	2309	2234	2262	1928
3.	Recipient value	832	442	648	802	893	1029	1080	1072	1080	1074	1077
4.	Nonrecipient value[b]	323	17	51	79	117	168	219	264	351	521	1408
B. Indirect subsidies[c] (tax expenditures)												
5.	Employer-provided health insurance	530	63	119	187	260	333	407	501	504	688	912
6.	Employer-provided sickness & accident insurance	32	1	3	6	10	15	20	27	34	44	83
7.	Tax deductible health care expenses	153	35	95	108	116	121	128	137	145	160	330

SOURCES: Rows 1, 2, 3, 5, 6: Calculated from March 1980 CPS data tapes. See Smeeding (1982) for the basis of rows 1, 2, and 3, and Smeeding (1981) for rows 5 and 6.

Row 4: Estimated from March 1980 CPS data tapes; U.S. Department of the Treasury (1981); Congressional Budget Office (1981).

Row 6: Estimated from Steuerle and Hoffman (1979); U.S. Department of the Treasury (1981).

[a]Mean value per recipient household.

[b]Nonrecipient value equals government cost of Medicaid and Medicare minus (1.045 × recipient value). These benefits were distributed as equal proportions of federal personal income taxes paid by each household with federal income tax liability and divided by the number of taxpaying households in each decile to arrive at mean decile values.

[c]All indirect subsidies are measured at their market value.

of recipient value to market value, rise from 22.8 percent in the lowest decile to 55.9 percent in the highest with an overall mean value of 36.8 percent. This pattern reflects not only low willingness to pay for medical benefits at low-income levels but also almost a complete lack of willingness to pay for the portion of medical insurance that protects against need for institutional care at all income levels. Institutional care benefits were $11.8 billion on a government cost basis in 1979, 27 percent of the government cost of Medicare and Medicaid subsidies.

Nonrecipient benefits (row 4) averaged $323 per taxpaying household with a very regressive benefit pattern reflecting the size distribution of federal income tax payments by money income decile. Mean indirect benefits are also regressively distributed, not only because of rising marginal federal personal income tax rates, but also because mean employer cost per beneficiary for employer-provided health insurance increases from $446 in the lowest decile to $1309 in the highest decile. Employer subsidies for sickness and accident insurance follow a similar pattern. Because only those who itemize deductions can benefit from these deductions, and because itemizers are largely in the highest three deciles, benefits are regressively distributed. The regressivity of tax deductions for health insurance and other tax deductible health care expenses has previously been established by Steuerle and Hoffman (1979). Because mean benefits are calculated per beneficiary household we cannot generally add benefits together. However, because over 90 percent of those covered by either employer health insurance or employer sickness and accident insurance are covered by both programs we can add these benefits together with little loss in accuracy (Smeeding 1981). Combining these items we find that a typical employee in the highest decile receives an indirect subsidy of almost $1000—somewhat more than the average recipient value of direct medical subsidies of $832.

Turning to table 3 we can more readily assess the distributional impacts of medical subsidies. The conventional method of valuing in-kind benefits, at their government cost as in row 2, produces a benefit distribution which is quite equalizing in nature. The $8.6 billion of government cost allocated to the lowest income decile is over 42 percent of their aggregate post-tax money income share of $20.3 billion. Using a true market value measure (row 3) increases this fraction to 54.2 percent of disposable income. Switching to recipient value (row 4), we find that benefits from Medicare and Medicaid are still equalizing in nature, but to a much lower degree. In this case, benefits to the lowest decile are only 15.3 percent of their disposable income share. Adding recipient and nonrecipient value to arrive at our preferred measure of the value of direct subsidies (row 9) further reduces the equalizing impact of medical subsidies. These results can be compared to the conventional method of distributing the value of Medicare and Medicaid in row 2. Large differences can be noted, particu-

Table 4.3 **Distributional Impact of Aggregate Medical Care Subsidies by Money Income Decile in 1979 (in $ billions) (percent distribution in parentheses)**

Row	Benefit Measure and Type	Aggregate Value	Money Income Decile									
			Lowest	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Highest
1.	Post-tax money income											
		$1341.2	$20.3	$39.0	$62.1	$83.5	$105.6	$130.3	$156.2	$186.1	$263.0	$329.1
		(100.0)	(1.5)	(2.9)	(4.6)	(6.2)	(7.9)	(9.7)	(11.6)	(13.9)	(17.1)	(24.5)
A.	Direct subsidies (Medicare and Medicaid)											
2.	Government cost											
		43.7	8.6	9.7	7.3	5.2	3.6	2.5	2.1	1.7	1.5	1.5
		(100.0)	(19.7)	(22.2)	(16.7)	(11.9)	(8.2)	(5.7)	(4.8)	(3.9)	(3.4)	(3.4)
3.	Market value											
		56.1	11.0	12.4	9.4	6.7	4.6	3.2	2.7	2.2	1.9	1.9
		(100.0)	(19.7)	(22.2)	(16.7)	(11.9)	(8.2)	(5.7)	(4.8)	(3.9)	(3.4)	(3.4)
4.	Recipient value											
		23.8	3.1	4.4	3.8	3.0	2.5	1.9	1.5	1.3	1.2	1.2
		(100.0)	(12.9)	(18.4)	(16.0)	(12.5)	(10.5)	(8.0)	(6.3)	(5.5)	(5.0)	(5.0)
5.	Nonrecipient value[a]											
		22.8	.1	.4	.6	.8	1.2	1.6	1.9	2.5	3.7	10.1
		(100.0)	(.4)	(1.8)	(2.6)	(3.5)	(5.3)	(7.0)	(8.3)	(11.0)	(16.2)	(44.3)
B.	Indirect subsidies (tax expenditures)											
6.	Employer-provided health insurance											
		17.1	[b]	.1	.3	.6	1.2	1.6	2.2	2.9	3.8	5.0
		(100.0)	([b])	(.6)	(1.7)	(3.3)	(6.7)	(9.0)	(12.4)	(16.3)	(22.0)	(28.1)

7. Employer-provided sickness & accident insurance											
	1.4	[b]	[b]	[b]	[b]	.1	.1	.1	.2	.3	.6
	(100.0)	([b])	([b])	([b])	([b])	(7.1)	(7.1)	(7.1)	(14.3)	(21.4)	(42.9)
8. Tax deductible health care expenses											
	3.1	[b]	.1	.1	.1	.2	.2	.3	.4	.4	1.3
	(100.0)	([b])	(3.2)	(3.2)	(3.2)	(6.5)	(6.5)	(9.7)	(12.9)	(12.9)	(41.9)
C. Total subsidies											
9. Value of direct subsidies[c]											
(4 + 5)	46.6	3.2	4.8	4.4	3.8	3.7	3.5	3.4	3.8	4.9	11.3
	(100.0)	(6.9)	(10.2)	(9.4)	(8.1)	(7.9)	(7.5)	(7.3)	(8.1)	(10.5)	(24.2)
10. Value of indirect subsidies											
(6 + 7 + 8)	22.3	.1	.2	.4	.7	1.5	1.9	2.6	3.5	4.5	6.9
	(100.0)	(.4)	(.9)	(1.8)	(3.1)	(6.7)	(8.5)	(11.7)	(15.7)	(20.2)	(30.9)
11. Value of direct plus indirect subsidies											
(9 + 10)	$68.9	$3.3	$5.0	$4.8	$4.5	$5.2	$5.4	$6.0	$7.3	$9.4	$18.2
	(100.0)	(4.8)	(7.3)	(7.0)	(6.5)	(7.5)	(7.8)	(8.7)	(10.6)	(13.6)	(26.4)

Numbers may not sum to totals because of rounding.

SOURCES: Rows 1, 5: Estimated from March 1980 CPS data tapes; U.S. Department of the Treasury (1981). Rows 2, 3, 4, 6, 7: Estimated from March 1980 CPS data tapes. See Smeeding (1982) for the basis of rows 2, 3, and 4, and Smeeding (1981) for rows 6 and 7. Row 8: Estimated from Steuerle and Hoffman (1979); U.S. Department of the Treasury (1981).

[a]Nonrecipient value equals government cost of Medicaid and Medicare minus (1.045 × recipient value). These benefits are distributed as equal proportions of federal personal income tax paid by each household with federal income tax liability.

[b]Less than $.1 billion or less than .1 percent.

[c]Value of direct subsidies is estimated by combining recipient and nonrecipient values.

larly for the highest and lowest deciles. For instance, the share of direct subsidies accruing to the highest decile is $1.5 billion or 3.4 percent of benefits using the conventional government cost approach, as compared to $11.3 billion or 24.2 percent of benefits when recipient and nonrecipient values are aggregated in row 9.[11]

4.3.4 Housing Subsidies

The distribution of housing subsidies are shown in tables 4.4 and 4.5. Neither mean nor aggregate government cost was distributed across beneficiaries because our definition of market value is akin to the definition used by others who have distributed these benefits. Excluded from the estimates of direct subsidies are estimates of the annual value of FHA, VA, and FHMA mortgages. The available information on recipients of these subsidies indicates that the majority of benefits were received by households with above average incomes in 1978 (Manser 1981, p. 52–53). Thus, if we were able to estimate their value they apparently would be disequalizing. Also excluded were $2.4 billion in tax expenditures for municipal housing bonds, for tax-deferred capital gains for those selling their homes and purchasing another within the specified time limit, and for the capital gains exclusion for qualifying elderly. These would also accrue mainly to upper-income groups (Congressional Budget Office 1978). Thus, if data on omitted types of public subsidies for housing were available we would find their distribution disequalizing.

Mean market value for public housing (table 4.4, row 1) are progressively distributed for two reasons. First, over 99 percent of public housing benefits accrue to households in the lower 50 percent of the income distribution; secondly, the market value of these benefits is equal to the private market rental value of the housing unit net of tenant contributions. Because tenant contributions are roughly 25 percent of net income, the tenant contribution increases and the net subsidy decreases as income increases, all else equal. Recipient values are also propoor because of the first reason mentioned above. However, because recipient willingness to pay for housing rises with income, the pattern of recipient values is much less propoor. Mean benefit weights for public housing increase only from 59 percent in the lowest decile to 79 percent in the highest decile, with a mean value of 65 percent.

Mean nonrecipient benefits are prorich because of their income tax payments distributor. Mean direct subsidies are even more prorich because of the unequal distribution of taxes paid by those with itemized returns claiming interest deductions, and those with itemized returns claiming deductions for state and local taxes paid. Because of the great deal of overlap between these two groups of indirect subsidy beneficiaries we may again add mean values with little loss of accuracy. If so we find overall mean benefits of $635—about the same as mean recipient values

Table 4.4 **Distributional Impact of Public Housing Subsidies by Household Money Income Decile: Mean Value Per Recipient Household in 1979**

Row	Benefit Measures and Type	Overall Mean Value[a]	Money Income Decile									
			Lowest	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Highest
A. Direct subsidies												
1.	Market value	$980	$1205	$1070	$796	$531	$552	[b]	[b]	[b]	[b]	[b]
2.	Recipient value	636	715	739	496	372	436	[b]	[b]	[b]	[b]	[b]
3.	Nonrecipient value[c]	54	3	8	13	19	27	37	44	59	86	239
B. Indirect subsidies[d] (tax expenditures)												
4.	Mortgage interest	383	23	114	133	184	235	271	319	377	428	613
5.	Property tax	252	19	51	75	98	123	135	165	198	274	405

SOURCES: Rows 1, 2: Calculated from March 1980 CPS data tapes; Doyle et al. (1980). Rows 3, 4, 5: Estimated from March 1980 CPS data tapes; U.S. Department of the Treasury (1978, 1981); Congressional Budget Office (1978).

[a]Mean value per recipient household.

[b]Less than 30,000 households in this cell.

[c]Nonrecipient value equals government cost minus (1.045 × recipient value). These benefits are distributed as equal proportions of federal personal income taxes by each household with federal income tax liability and divided by the number of taxpaying households in each decile to arrive at mean decile values.

[d]All indirect subsidies are measured at their market value.

Table 4.5 **Distributional Impact of Aggregate Housing Subsidies by Money Income Decile in 1979 (in $ billions) (percent distribution in parentheses)**

Row	Benefit Measure and Type	Aggregate Value	Money Income Decile									
			Lowest	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Highest
1.	Post-tax money income											
		$1341.2	$20.3	$39.0	$62.1	$83.5	$105.6	$130.3	$156.2	$186.1	$229.0	$329.1
		(100.0)	(1.5)	(2.9)	(4.6)	(6.2)	(7.9)	(9.7)	(11.6)	(13.9)	(17.1)	(24.5)
A.	Direct subsidies											
2.	Market value											
		4.6	2.2	1.4	.6	.2	.1	.1	[b]	[b]	[b]	[b]
		(100.0)	(47.4)	(29.9)	(12.7)	(4.1)	(2.0)	(2.0)	([b])	([b])	([b])	([b])
3.	Recipient value											
		3.0	1.3	1.0	.3	.1	.1	.1	[b]	[b]	[b]	[b]
		(100.0)	(46.1)	(38.5)	(13.0)	(.7)	(.5)	(.5)	([b])	([b])	([b])	([b])
4.	Nonrecipient value[a]											
		3.7	[b]	.1	.1	.1	.2	.3	.3	.4	.6	1.7
		(100.0)	([b])	(2.6)	(2.7)	(2.7)	(5.4)	(6.8)	(8.1)	(10.8)	(16.2)	(44.6)

B. Indirect subsidies (tax expenditures)											
5. Mortgage interest											
	9.3	[b]	.1	.1	.2	.3	.6	1.0	1.6	2.0	3.4
	(100.0)	([b])	(.7)	(.8)	(1.5)	(3.2)	(5.7)	(9.6)	(16.6)	(21.7)	(39.5)
6. Property tax											
	6.4	[b]	[b]	.1	.1	.2	.3	.5	1.0	1.4	2.8
	(100.0)	([b])	([b])	(1.3)	(1.4)	(3.1)	(5.3)	(7.7)	(15.5)	(22.3)	(43.5)
C. Total subsidies											
7. Value of direct subsidies[c]											
(3 + 4)	6.7	1.3	1.1	.4	.2	.3	.4	.3	.5	.6	1.7
	(100.0)	(19.3)	(16.3)	(5.9)	(3.0)	(4.5)	(5.9)	(4.5)	(7.5)	(8.9)	(25.2)
8. Total value of indirect subsidies											
(5 + 6)	15.7	[b]	.1	.2	.3	.5	.9	1.5	2.6	3.4	6.2
	(100.0)	([b])	(.6)	(1.2)	(1.9)	(3.2)	(5.7)	(9.6)	(16.6)	(21.7)	(39.5)
9. Value of direct plus indirect subsidies											
(7 + 8)	22.4	1.3	1.2	.6	.5	.8	1.3	1.8	3.1	4.0	7.9
	(100.0)	(5.7)	(5.4)	(2.7)	(2.2)	(3.6)	(5.7)	(8.0)	(13.8)	(17.9)	(35.1)

Numbers may not sum to totals because of rounding.

SOURCES: Rows 1, 2, 3: Calculated from March 1980 CPS data tapes; Doyle et al. (1980); U.S. Department of the Treasury (1981). Rows 4, 5, 6: Estimated from March 1980 CPS data tapes; U.S. Department of the Treasury (1978, 1981); Congressional Budget Office (1978).

[a]Nonrecipient value equals government cost of public housing minus (1.045 × recipient value). These benefits are distributed as equal proportions of federal personal income tax paid by each household with federal income tax liability.

[b]Less than $1 billion or less than .1 percent.

[c]Total value of direct subsidies is estimated by combining recipient and nonrecipient value (rows 3 and 4).

for direct subsidies. In the highest decile total mean indirect subsidies of $1018 are above the overall mean market value of direct housing subsidies.

In table 4.5 benefits as measured by both the conventional market value approach and the recipient value approach (rows 2 and 3) are equalizing, while nonrecipient benefits are disequalizing. Adding recipient and nonrecipient value (row 7) nets out both types of effects, though the lowest decile still receives benefits far in excess of their post-tax money income share in row 1. Indirect subsidies (row 8) are quite disequalizing, with their size distribution benefiting only the top three deciles in excess of their disposable income share. When direct and indirect subsidies are combined in row 9 we find a U-shaped distribution with beneficiaries in the first and second deciles and in the top two deciles benefiting in excess of their post-tax income shares. The net effect seems to be slightly propoor with benefits in the bottom two deciles exceeding their money income shares to a greater extent than those in the top deciles. If we were able to distribute the housing subsidies not measured in this table, the net effect of all housing subsidies would be roughly neutral with respect to both ends of the distribution. Only the middle portion of the distribution would have benefits below their money income share.

4.3.5 Combined Values

Finally, we can add overall medical care subsidies (table 4.3, row 11) and housing subsidies (table 4.5, row 9) to get an idea of their net effect on the money income size distribution. In addition, we can compare the distributional impact of direct in-kind subsidies using the conventional market value (or government cost for medical care) approach as compared to the recipient value–nonrecipient value approach recommended in this paper. Table 4.6 presents these results.

Part A of table 4.6 clearly indicates a large difference between the conventional market value/government cost approach and the suggested recipient plus nonrecipient benefit approach to valuing direct in-kind subsidies. The suggested approach is much less propoor than the conventional approach, particularly as far as the highest money income quintile is concerned. Adding the value of indirect subsidies to our suggested approach, we arrive at an estimate of the total net distributive effect of these subsidies. As expected, the post-tax money income share of the lowest quintile is below their share of total in-kind subsidies, but not as expected, so is the top quintile's share! That is, accepting our framework, the richest 20 percent of households receive a larger share of in-kind housing and medical subsidies than their share of money income.

As one moves down the rows of table 4.6 away from the conventional measure of the size distribution of direct subsidies toward a different

Table 4.6 **The Net Effect of Medical Care and Housing Subsidies on the Size Distribution of Post-Tax Money Income in 1979 (in $ billions) (percent distribution in parentheses)**

Row	Benefit Measure and Type	Value of Benefits (billions)			
		Aggregate Value	Lowest Quintile	Middle Three Quintiles	Highest Quintile
1.	Post-tax money income	$1341.2	$59.5	$723.6	$558.1
		(100.0)	(4.4)	(54.0)	(41.6)
A.	Direct subsidies only				
2.	Conventional approach[a]	48.3	21.9	23.4	3.0
		(100.0)	(45.3)	(48.4)	(6.2)
3.	Suggested approach[b]	53.3	10.4	24.4	18.5
		(100.0)	(19.5)	(45.8)	(34.7)
B.	Total subsidies				
4.	Direct plus indirect subsidies[c]	91.3	11.3	40.5	39.5
		(100.0)	(12.4)	(44.4)	(43.3)

Numbers may not sum to totals because of rounding.

SOURCES: Tables 4.3 and 4.5.

[a]Market value for public housing (table 4.5, row 2) plus government cost for medical care (table 4.3, row 2).

[b]Recipient plus nonrecipient value of direct subsidies (table 4.3, row 9, plus table 4.5, row 7). Row 3 exceeds row 2 above as a result of the treatment of the institutionalized and the allocation of government cost in excess of the market value of public housing to nonrecipient beneficiaries.

[c]Recipient plus nonrecipient value of direct subsidies (row 3) plus value of all indirect subsidies (table 4.3, row 10, plus table 4.5, row 8).

approach which includes measuring the effect of all types of public subsidies on the income size distribution, the share of subsidies accruing to the bottom quintile continues to decline while that of the top quintile increases to a much greater degree. Clearly one's choice of the types of in-kind subsidies to include in a distributional analysis, one's approach to valuing those subsidies, and their distributors all have an important role to play in determining their impact on the income size distribution.

4.4 Summary and Implications for Social Accounting

The purpose of this paper was to demonstrate the policy use of several alternative measures of the value of public in-kind subsidies. Applications were made to a subset of medical care and housing subsidies. Rough estimates of the efficiency gains or losses from the program delivery system were made. The efficiency benefits from the current Medicare program and the efficiency costs of current public housing programs were shown. Rough estimates of the effect of various valuation approaches on

the money income size distribution were also made. Once all types of medical care and housing subsidies covered in this paper were combined, we find that both the poor and the rich benefit in excess of their post-tax money income shares. Several implications for social accounting can be drawn from these results.

One immediate recommendation is to group all direct and indirect subsidies by subsidy category (health care, housing, food, etc.) to determine their net budgetary impact and distributional effect. The Congressional Budget Office (1981) now groups tax expenditures by subsidy area, but does not include direct subsidies for the same commodity. Few if any analyses of the total impact of public subsidies on income distribution are available even in rough form (Wilensky 1981).

In the area of efficiency considerations two suggestions can be made. First of all, additional analyses of the delivery mechanism for public in-kind subsidies comparing the government cost, market value, and alternative government cost of providing various subsidies is necessary. While we have examined only Medicare and public housing, this analysis can and should be extended to other direct and indirect subsidies. For instance, can we design a direct federal catastrophic health insurance subsidy that achieves the objectives of the current tax deduction subsidy system more effectively and more equitably? Second, the concept of social benefit value demands additional attention. When all equity and efficiency considerations are considered, in-kind subsidies may be more efficient and equitable means for reaching certain public goals than are equal value cash transfers.

In the area of assessing the distributional impact of in-kind subsidies, we must begin to clearly differentiate between recipient and nonrecipient benefits, particularly in the area of health care and education subsidies. The size distribution of the market value or government cost of a particular subsidy may suggest misleading conclusions about their impact on the extent of poverty or on the inequality of income. In particular, we must develop better estimates of the recipient value of public subsidies and realize that these values are the conceptually appropriate concept for estimating the impact of in-kind subsidies on poverty, affluence, and inequality. The value of nonrecipient benefits, which might lead us to prefer in-kind subsidies to cash transfers on efficiency or overall equity grounds, should be distributed to the true beneficiaries not just allocated to recipients by the conventional market value/government cost methodology.

We hope this paper will stimulate discussion of these issues and further refinement of the concepts suggested above. In our judgment, this line of research will prove a cost-effective investment in more efficient and equitable public policy.

Notes

1. We implicitly assume that social cost and government cost are synonymous.

2. Government cost may also be defined to include the deadweight loss or welfare costs associated with the additional taxes or public debt needed to fund a given subsidy. Further, if means-tested subsidies reduce beneficiary labor supply, an additional indirect cost element may arise (see Moffitt 1981; Murray 1981). However, we do not estimate these costs in this paper.

3. This conclusion must be tempered by the possibility that a substantial growth in HMOs and other forms of prepaid health care may reduce health care costs below those currently experienced in the predominant fee-for-service health care system (Ginsburg 1981b).

4. The reader should note that in cases where the government cost of a particular in-kind benefit falls short of the market value of the benefit *and* where the recipient value exceeds the market value of the benefit, recipient value can exceed government cost. For instance, suppose a Medicare beneficiary finds that he would have spent an amount on health insurance exceeding the market value of the Medicare benefit package if presented with an equal cash transfer. In this case the cash equivalent value of the medical care benefit exceeds the government cost of providing that specific set of medical care benefits because of the selling cost advantages of Medicare over private insurance providers.

5. Again we ignore behavioral response to such a change. For instance, transforming an in-kind program into an equal welfare benefit cash program may increase participation in the cash program (because of lower stigma cost or other factors), in which case the cost of the cash program would rise.

6. There are a number of potential distributors for nonrecipient or nonexclusive public good benefits (Reynolds and Smolensky 1977; O'Higgins and Ruggles 1981). We chose the equal proportion of income tax distributor, implicitly assuming an income elasticity of demand in excess of unity for these benefits (because of the progressive personal income tax). It makes sense to argue that higher-income households have a relatively higher demand for in-kind benefits than recipients. Presumably the majority of in-kind benefit recipients, lower-income persons and the elderly, pay lesser portions of federal taxes and would prefer equal-cost cash transfers over in-kind transfers because they put a higher value on the cash benefits. Further support for such a distributor has been indirectly provided by Aaron and McGuire (1970). Alternative distributors could provide a more progressive (e.g., if distributed in proportion to capital income) or less progressive (e.g., if distributed on a per capita or per household basis) nonrecipient benefit distribution than the alternative we have chosen. For these reasons, we feel that our choice of distributors is both plausible and sensible.

7. Entries in the value of benefits column in table 4.1 are exactly equivalent to market value as defined in section 4.2 in the case of public housing. In the case of Medicare, however, the value of benefits equals the cost of vendor payments excluding the overhead and administrative charges which are appropriately part of market value when medical benefits are measured by their insurance value. This differentiation was necessary to bring out the fact that the value of medical benefits in terms of vendor payments, or insurance claims, are held constant when comparing alternative government cost and current government cost in table 4.1.

8. For instance, the Food Stamp program costs roughly 8.5 percent in excess of the market value of the stamps (MacDonald 1977), while the Medicaid program experiences claims processing costs averaging 5.4 percent of vendor payments (Smeeding 1982).

9. In the earlier literature, it was generally assumed that the market value and government cost of Medicare and Medicaid were equal. However, recent evidence (Ginsburg 1981b; table 1) strongly suggests that private market value exceeds government cost.

10. We would like to thank Joseph Minarik for suggesting this strategy.

11. The aggregate value of direct subsidies (row 9) exceeds the government cost of subsidies to CPS beneficiaries (row 2) by $2.9 billion because of taxpayers' nonrecipient benefits on behalf of the institutionalized who are not covered by the CPS, but who do receive Medicaid and Medicare coverage.

References

Aaron, H., and M. McGuire. 1970. Public goods and income distribution. *Econometrica* 38:907–20.

Browning, Edgar K. 1976. The trend toward equality in the distribution of net income. *Southern Economic Journal* 42:912–23.

Congressional Budget Office. 1977. *Poverty status of families under alternative definitions of income.* Background Paper no. 17 (revised). Washington, D.C.: GPO.

———. 1978. *Federal housing policy: Current programs and recurring issues.* Background Paper. Washington, D.C.: GPO.

———. 1979. *The long-term costs of public housing programs.* Background Paper. Washington, D.C.: GPO.

———. 1981. *Tax expenditures: Current issues and five-year budget projections for fiscal years 1982–1986.* Report to Congress. Washington, D.C.: GPO

Cooper, C., and A. Katz. 1978. *The cash equivalent of in-kind income.* Stamford, Conn.: Cooper and Company.

DeSalvo, Joseph S. 1971. A methodology for evaluating housing programs. *Journal of Regional Science* 11:173–85.

Doyle, Mary P., David Edson, Norma Pappas, and William Boulding. 1980. *Creation of 1980 and 1984 data bases from the March 1978 CPS, volume I, final report.* Washington, D.C.: Mathematica Policy Research.

Garfinkel, I., and T. Smeeding. 1981. Cash vs in-kind benefits: A conference proposal. University of Wisconsin-Madison. Mimeo.

Ginsburg, Paul. 1981a. Altering the tax treatment of employment based health plans. *Milbank Memorial Fund Quarterly* (Spring).

———. 1981b. Medicare vouchers and the procompetitive strategy. *Health Affairs* 1:39–52.

Health Insurance Institute. 1980. *Source book of health insurance data 1979–1980.* Washington, D.C.: Health Insurance Institute.

Hicks, John R. 1943. The four consumer surpluses. *Review of Economic Studies* 7.

Hoagland, G. William. 1980. The effectiveness of current transfer programs in reducing poverty. Paper presented to Middlebury College

Conference on Economic Issues, 19 April, Middlebury, Vermont. Mimeo.

Hochman, Harold, and James Rodgers. 1969. Pareto optimal redistribution. *American Economic Review* 59:542–57.

Krashinsky, Michael. 1980. The role of in-kind transfers in income distribution. New Haven, Conn.: Yale University. Mimeo.

Lampman, Robert, and Timothy Smeeding. 1983. Interfamily transfers as alternatives to government transfers to persons. *Review of Income and Wealth*, 29:45–66.

MacDonald, M. 1977. *Food stamps and income maintenance*. New York: Academic Press.

Manser, M. 1981. *Analyzing in-kind income receipt using the SIPP panel data*. Washington, D.C.: Mathematica Policy Research.

———. 1982. *Analyzing in-kind housing and medical benefits using the 1979 ISDP panel data*. Washington, D.C.: Mathematica Policy Research.

Mayo, S. K., S. Mansfield, W. D. Warner, and L. Zwetchkenbaum. 1980. *Housing allowances and other rental assistance programs—A companion based on the housing allowance demand experiment, part 2: Costs and efficiency*. Cambridge, Mass.: Abt Associates Inc.

Moffitt, Robert A. 1981. The negative income tax: Would it discourage work? *Monthly Labor Review* 103, no. 4:23–27.

Morrall, John F., and Edgar O. Olsen. 1980. The cost-effectiveness of leased public housing. *Policy Analysis* 6:151–70.

Murray, Michael. 1980. Tenant benefits in alternative federal housing programmes. *Urban Studies* 17:25–34.

———. 1981. A reinterpretation of the traditional income-leisure model, with application to in-kind subsidy programs. *Journal of Public Economics* 14:69–81.

Musgrave, Richard A. 1959. *The theory of public finance*. New York: McGraw-Hill.

Nichols, Albert L., and Richard J. Zeckhauser. 1981. Targeting transfers through restrictions on recipients. Paper presented to the American Economic Association, 29 December, Washington, D.C.

O'Higgins, M., and P. Ruggles. 1981. The distribution of public expenditures and taxes among households in the United Kingdom. *Review of Income and Wealth* 27:298–326.

Okner, Benjamin. 1980. Distributional aspects of tax reform during the past fifteen years. *National Tax Journal* 32:11–27.

Paglin, M. 1980. *Poverty and transfers in-kind*. Palo Alto, Calif.: Hoover Institution Press.

Reynolds, M., and E. Smolensky. 1977. *Public expenditures, taxes and the distribution of income: The United States, 1950, 1961, 1970*. New York: Academic Press.

Rydell, C., J. Mulford, and L. Helbers. 1980. *Price increases caused by housing programs*. Rand Corporation Report R-2677-HUD. Santa Monica, Calif.: Rand Corporation.

Schuttinga, James. 1981. Telephone conversation, June 9.

Smeeding, Timothy M. 1975. *Measuring the economic welfare of low-income households, and the anti-poverty effectiveness of cash and non-cash transfer programs*. Ph.D. diss., University of Wisconsin-Madison.

———. 1981. The size distribution of wage and nonwage compensation: Employer cost vs recipient value. Paper presented to the National Bureau of Economic Research Conference on Labor Cost, 3 December, Williamsburg, Virginia.

———. 1982. *Alternative methods for valuing in-kind transfer benefits and measuring their impact on poverty*. Technical Report 50, U.S. Bureau of the Census. Washington, D.C.: GPO.

Smeeding, Timothy M., and M. Moon, 1980. Valuing government expenditures: The case of medical care transfers and poverty. *Review of Income and Wealth* 26:305–24.

Smolensky, E., L. Stiefel, M. Schmundt, and R. Plotnick. 1977. Adding in-kind transfers to the personal income and outlay account: Implications for the size distribution of income. In T. Juster (ed.), *The distribution of economic well-being*, ed. F. T. Juster. Studies in Income and Wealth, vol. 41. Cambridge, Mass.: Ballantine for the National Bureau of Economic Research.

Social Security Bulletin. 1982. February. Washington, D.C.: GPO

Steuerle, Eugene, and R. Hoffman. 1979. Tax expenditures for health care. *National Tax Journal* 32:101–15.

Thexton, Peter M. 1978. Letter to Morton B. Hess, Office of the Actuary, Social Security Administration.

Thurow, Lester. 1974. Cash versus in-kind transfers. *American Economic Review* 64, no. 2: 190–95.

Tobin, James. 1970. On limiting the domain of inequality. *Journal of Law and Economics* 13:263–77.

U.S. Bureau of the Census. 1981. Characteristics of households and persons receiving noncash benefits: 1979. *Current population reports*, series P-23, no. 110. Washington, D.C.: GPO.

U.S. Department of Health and Human Services. 1980. *Medicare 1979*. Health Care Financing Administration. Washington, D.C.: GPO.

U.S. Department of Housing and Urban Development. 1974. *Housing in the seventies: A report of the National Housing Policy Review Commission*. Washington, D.C.: GPO.

———. 1979. *Experimental housing allowance program: A report of findings*. Washington, D.C.: GPO.

U.S. Department of the Treasury. 1978. Tax expenditures affecting individuals, fiscal year 1977. *Muskie News* 13 (February), appendix.

———. 1981. Individual income tax returns, 1979; Income, deductions, residential energy credit. *SOI Bulletin* 1:1–22.
Weinberg, Daniel. 1982. Housing benefits from the section 8 housing program. *Evaluation Review* 6:5–24.
Weisbrod, Burton. 1969. Collective action and the distribution of income: A conceptual approach. *The analysis and evaluation of public expenditures: The PPB system.* Report prepared for the U.S. Joint Economic Committee, 93d Congress. Washington, D.C.: GPO.
Wilensky, Gail R. 1981. Government and the financing of health care. Paper presented to the American Economic Association, 30 December, Washington, D.C.

Comment

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Measurement of in-kind income has received increasing attention from academic economists and government statisticians during the last decade. This heightened interest primarily has reflected the growth of government in-kind subsidies and what is perceived as a resulting bias in measures of poverty based on money income alone. In this tradition, the paper by Timothy Smeeding considers the valuation issue—that is, how to place dollar values on the in-kind income—and presents estimates of the distribution of public in-kind subsidies in the areas of health and housing.

Smeeding defines four alternative valuations: (1) market value defined as the cost of the goods and services on the private market; (2) government cost defined as the cost to the government of providing the goods and services, including costs of program management; (3) recipient or cash equivalent value defined as the value of the goods and services to the recipient, which conceptually is the money income that would be required for the recipient to forego the transfer (Hick's equivalent variation concept); and (4) social benefit value defined as the value of the goods and services to recipients and to nonrecipients; as with cash equivalent value this is a welfare concept.

A number of relationships are posited between the valuations and are explored in the empirical sections of the paper. (1) Government cost differs from market value when the government is more or less efficient than the private sector in providing an identical good or service. (2) The cash equivalent value is generally less than the market value and government cost because the subsidy constrains or induces recipients to spend

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more on the good than they would choose to spend if given cash. (3) The social benefit value is at least as great as government cost if the subsidy is efficient in an economic sense. (4) The social benefit value is generally greater than the cash equivalent value, giving rise to nonrecipient benefits.

There are two main purposes of the paper. The first is to point out that the different valuations are appropriate for different uses. Specifically, government cost is appropriate for studies of budgetary impacts, and comparisons of government cost and market value can be used in studies of government efficiency. The cash equivalent value is appropriate for including in-kind income in measures of poverty and income distribution. And the social benefit value is appropriate for studies of efficiency and of income distribution. While these points are not new, it is always useful to stress the importance of relating measures to their intended uses. The second purpose of the paper is to illustrate uses of the alternative values of government housing and medical care subsidies in studies of efficiency and of distribution of income.

To illustrate efficiency studies, the author compares the direct provision by the government of health insurance (Medicare) and of public housing to indirect provision through vouchers enabling recipients to purchase health insurance and housing in the private market. In this illustration, the differences between government costs and private market costs of providing identical recipient benefits are compared. He finds that direct provision of health insurance is more "efficient" than are health insurance vouchers but that public housing is less "efficient" than are housing vouchers. Efficiency, which can be interpreted in many ways, is used in a narrow sense in this illustration. Measured costs do not represent true resource costs, which may differ between direct government provision and indirect provision through vouchers, for example, if one is better in controlling upward pressure on prices, in regulating fraud, or in reducing unnecessary use of medical care. Moreover, comparisons of alternative delivery systems on economic efficiency grounds cannot ignore likely differences in outcomes for beneficiaries. For example, without low-rent public housing, would sufficient low-rent housing in inner cities be available to meet the demand, and would it be available to all races? In other words, recipient values are not usually independent of delivery systems.

The author then presents estimates of the aggregate values and distributional effects of medical care and housing subsidies by alternative valuation techniques. Both direct subsidies (Medicare, Medicaid, and public housing) and indirect subsidies through the tax system (tax deductions for employer-provided health and accident insurance, medical care expenses, mortgage interest, and property taxes) are considered. Direct subsidies include benefits to nonrecipients as well as to recipients.

The distributional effects of the subsidies as estimated by the author are generally consistent with our intuition and other studies. The direct subsidies to recipients in 1979 were equalizing in that a greater share of the subsidies went to the lower-income deciles than their existing share of after-tax money income. Of the direct subsidies considered, most are means-tested so that this result is not surprising. The indirect subsidies to recipients or tax expenditures were disequalizing; that is, a greater share went to the higher-income deciles than their existing share of after-tax money income. The indirect subsidies are regressive because to benefit requires itemization on tax returns, because subsidies increase with tax rates, and because employer-provided health benefits rise with income. The value of the subsidies for nonrecipients (that is, the altruistic benefits enjoyed by nonrecipients) were disequalizing because they were distributed in proportion to tax payments. Aggregating all direct and indirect subsidies, which is the author's preferred approach, shows that the shares received by both the lowest and the highest quintiles exceeded their shares of after-tax money income. The middle classes were the big losers.

However, the assumptions that underlie the distributional estimates are often very strong, and the findings are quite sensitive to the assumptions. The least satisfactory aspect of the paper in my view is its measurement of the values of in-kind subsidies for nonrecipients. To estimate the aggregate value for any in-kind subsidy, the author first assumes that the total social benefit value equals government cost. (The author states that in theory the value *at least* equals government cost but the estimates are based on the equality assumption.) Then the value of benefits to nonrecipients is the difference between government cost and the aggregate recipient value plus costs of program management. This nonrecipient value is distributed across income classes in proportion to tax payments.

Both resulting aggregate values and their distributions across income classes have little justification. As to the aggregate values, there is no reason to believe that the social benefit value equals government cost for every, or indeed any, in-kind subsidy. To assume so precludes inefficient government programs or programs where benefit-cost ratios exceed one. It should also be noted that in at least one other study (Smolensky et al. 1977) nonrecipient values have been taken to equal the *full* government cost of the subsidy, not just the difference between government cost and recipient benefits.

As to the distribution of the nonrecipient values, the paper treats them as pure public goods. Yet nonrecipient benefits accrue to the relatives of recipients who would otherwise have paid for some of the consumption of health care and housing, as the paper discusses, and to the health and construction industries in the cases of Medicare-Medicaid and public housing, respectively. Moreover, even if the nonrecipient benefits are treated as pure public goods, distribution by tax payments is theoretically

questionable (Musgrave 1959). The distribution of public goods' benefits are, in the real world, unknown (and, given "free rider" problems, some would say unknowable). The wisest course, if they must be distributed, would seem to be to use a variety of alternative distributors, which has been done frequently in the economic literature. The distributors for public goods' benefits in the literature have included families (or households), income, capital income, disposable income, and the reciprocal of the marginal utility of expenditures (Aaron and McGuire 1970; Brennan 1981; Gillespie 1965). These studies have also found the distributive effects of public goods to vary sharply depending on which distributor is used. Because of this sensitivity, and the lack of a theoretical or practical reason for using tax payments as a distributor, the findings on nonrecipient benefits are questionable. Moreover, given how little we know about recipient benefits from in-kind income, I see little reason to embark on such a speculative endeavor as estimating the distribution of nonrecipient benefits at this time.

The estimates of the distributional effects of indirect subsidies or tax expenditures are also unsatisfactory because such subsidies are valued only at cost and not in cash equivalents. The inducement to overspend on direct subsidies, which results in cash equivalent values below cost, applies equally to indirect subsidies. Moreover, if the improvement of income measures for purposes of assessing relative well-being is the goal, measuring income on an after-tax basis is preferred. After-tax incomes of recipients of indirect subsidies are higher because of their receipt of the subsidies. Hence, one cannot add to the after-tax incomes the values of the indirect subsidies without double-counting their value.

The estimates of direct subsidies to recipients are more satisfactory. They are based on cash equivalent values, which rise with income given positive income elasticities. Hence, valuation in cash equivalents (or recipient valuation) leads to distributions of subsidies that are less equalizing than are distributions based on cost valuations. The author's ratios of cash equivalent values to market values (so-called benefit weights) for Medicare and Medicaid rose from 23 percent in the lowest income decile to 56 percent in the highest decile; their average value was 37 percent. One possible reason for this low value for medical care is that subsidies to the institutionalized are included while expenditures on institutional care are for the most part not included in the estimation of cash equivalent values. The weights for public housing subsidies rose from 59 percent to 79 percent, respectively, with an average value of 65 percent.

The estimates of cash equivalent values in the paper are only rough approximations to the true values. True cash equivalent values are measured by the money income that would leave the recipient on the same indifference curve as does the in-kind subsidy. Consequently, cash

equivalent values can be estimated only by utilizing assumed utility functions. The author's estimating technique, as I understand it, compares the consumption of the specific good inherent in the in-kind subsidy with the consumption of the same good by similar households without the subsidy. To make the households similar, certain demographic characteristics are controlled for and the income level of the nonsubsidized household is taken to be the money income *plus* market value of the in-kind subsidy of the subsidized household. The cash equivalent value of the in-kind subsidy is then taken to be the consumption of the nonsubsidized household when that consumption is less than the market value of the subsidy or the market value of the subsidy when the consumption of the nonsubsidized household is more than the subsidy.

As compared to true cash equivalent values, the author's approximation has several biases. First and most importantly, the approach may *over*estimate cash equivalent values because the income level of the nonsubsidized household is too high by the difference between the market value and cash equivalent value of the subsidy. This bias is obviously most important when cash equivalent values fall well below market values (for example, in the case of medical care subsidies) and when multiple in-kind subsidies are received. On the other hand, the approach may *under*estimate cash equivalent values because preferences for the in-kind subsidy of recipients will be systematically greater than preferences of nonrecipients who are also eligible for the subsidy but choose not to participate. For example, households with similar incomes and demographic characteristics who choose not to buy into the supplementary medical insurance (SMI) portion of Medicare presumably prefer less health insurance relative to other goods in their consumption bundle than do SMI recipients. It is not clear which of these biases will dominate.

It is true, as the author points out, that estimation by utility functions is problematic, both because the true utility function is unknown and because necessary data, such as geographic price differences, are lacking. Nonetheless, given the biases in the author's approximation, and the uncertainties about cash equivalent values in general, the results presented here should be viewed with caution.

This paper, and others by Smeeding, contribute to the growing literature on income in-kind. But considerable research and reform of our income statistics remain before income in-kind can be treated adequately and income and poverty measures made meaningful.

Our official statistics continue to be deficient in their treatment of in-kind income. Poverty measures exclude noncash income despite the fact that the Food Stamp program was enacted to provide the cost of nutritional diets to low-income families; such costs form the basis of the poverty threshold. Measures of family income based on Bureau of the Census surveys also exclude noncash income. And measures of personal

income in the National Income and Product Accounts are inconsistent in their inclusion of in-kind income—for example, including Medicare but excluding Medicaid—and deficient in their valuation of such income, which is by government cost rather than cash equivalent value.

These deficiencies in our official statistics are large and growing. Government in-kind subsidies to the low-income population grew sharply relative to cash income during the 1965–75 period as many of the noncash programs like Medicare and Medicaid were first implemented and expanded. Since 1975, government cash payments to low-income families have declined significantly in real terms. As a result, whereas government cash benefits accounted for around 40 percent of total benefits (cash plus noncash) to low-income families in 1975, by 1983 they are expected to account for only 30 percent of total benefits. In addition, while data are lacking, it is likely that employer-provided noncash income has risen relative to cash income.

Improvements in the treatment of noncash income have been made in recent years. The Bureau of the Census now routinely collects information on the recipiency of a few types of in-kind income in its March Current Population Survey and has recently published a study by Smeeding on valuing public in-kind transfers. If further progress is to be made, the most pressing needs are collection of better data on recipiency of private in-kind income and research developing and comparing alternative estimates of cash equivalent values. Only with the inclusion of this expanded information on in-kind income can we be assured that measures of income and their distribution portray with any reality the distribution of well-being across families and over time.

References

Aaron, Henry, and M. McGuire. 1970. Public goods and income distribution. *Econometrica* 38:907–20.

Brennan, Goeffrey. 1981. The attribution of public goods benefits. *Finances Publiques* 36:347–73.

Gillespie, W. Irwin. 1965. Effect of public expenditures on the distribution of income. In *Essays in fiscal federalism*, ed. Richard A. Musgrave. Washington, D.C.: The Brookings Institution.

Musgrave, Richard A. 1959. *The theory of public finance*. New York: McGraw-Hill.

Smolensky, Eugene, Leanna Stiefel, Maria Schmundt, and Robert Plotnick. 1977. Adding in-kind transfers to the personal income and outlay account: Implications for the size distribution of income. *The distribution of economic well-being*, ed. F. Thomas Juster. Studies in Income and Wealth, vol. 41. Cambridge, Mass. Ballantine for the National Bureau of Economic Research.