

# Transfers in Cash and In-Kind: Theory Meets the Data

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*We review theoretical explanations for in-kind transfers in light of the limited empirical evidence. After reviewing the traditional paternalistic arguments, we consider explanations based on imperfect information and self-targeting. We then discuss the large literature on in-kind programs as a way of improving the efficiency of the tax system and a range of other possible explanations, including the “Samaritan’s Dilemma,” pecuniary effects, credit constraints, asymmetric information amongst agents, and political economy considerations. Our reading of the evidence suggests that paternalism and interdependent preferences are leading overall explanations for the existence of in-kind transfer programs but that some of the other arguments may apply to specific cases. Political economy considerations must also be part of the story.*

## 1. Introduction

Moral philosophers have reflected on the role of the State in bringing about a just distribution of incomes from time immemorial. An enduring puzzle concerns the reasons why governments choose to conduct redistribution through in-kind rather than cash programs. In virtually all countries, developed and developing, a significant amount of redistribution occurs in-kind. The fraction of GDP spent on these programs is remarkably similar across OECD countries. Moreover, this share is growing in many countries. Hence, it behooves us to try to understand

why governments choose to redistribute in-kind, rather than in cash.<sup>1</sup>

Economists have traditionally been skeptical about in-kind transfers viewing cash as superior in terms of the recipient’s utility: in-kind transfers constrain the behavior of the recipients, while cash transfers do not. The traditional justification for in-kind transfers has been one of paternalism. Paternalism has different formulations in the literature, but one useful example involves interdependent preferences. If members of society care about the situation of the poor, then the unconstrained consumption choices of the

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<sup>1</sup>This survey ignores the issue of *how* in-kind transfers are to be provided, i.e., through direct public provision or, say, mandating that individuals must consume a certain level of the good subject to transfers. There is a vast literature on incentive issues faced by workers in the public, nonprofit, and private sectors. But these issues are extraneous to the focus of our survey.

poor may at times imply negative externalities for those who care about their welfare. Paternalistic arguments assume particular force when the intended recipient of a transfer program is a child but the transfer goes to parents. Parents may not take full account of the utility of their children when making decisions or they may neglect to factor in externalities. For example, suboptimal spending on children's education may lead not only to poorer individual prospects but also to slower future economic growth.

No doubt many in-kind transfer policies have an element of paternalism to them. But many other possible justifications for in-kind programs have been put forward in the literature. This survey reviews these explanations and considers the limited empirical evidence that can be brought to bear on them. Specifically, after first giving an overview of in-kind transfer programs and reviewing the traditional paternalistic arguments for them, we consider explanations based on imperfect information on the part of the government and self-targeting. This leads to a more general discussion of the issue of take up (or lack of take up) of program benefits. We then discuss the large theoretical literature that considers in-kind programs as a way of improving the efficiency of the tax system. The basic idea of this literature is that taxes distort labor supply, but that the provision of in-kind goods that are complementary to labor might mitigate this distortion. As we shall see, it is unlikely that this is the main motivation for most of the programs we consider; although it is possible that some in-kind transfer programs will have larger effects on long-run labor productivity and labor supply than cash transfers. Hence, we consider a range of other possible explanations, including the Samaritan's Dilemma, pecuniary effects, credit constraints, asymmetric information amongst agents, and political economy considerations.

Our survey highlights a disconnect between the theoretical and empirical work on in-kind transfers. Many theories seem to

be unmotivated by deep knowledge of the programs, and the empirical work seems to largely accept the paternalism theory and move on to other questions. Our own reading of the evidence suggests that paternalism and interdependent preferences are leading overall explanations for the existence of in-kind transfer programs but that some of the other arguments may apply to specific cases. Political economy considerations must also be part of the story.

## 2. *A Brief Overview of In-Kind Programs*

One of the most striking aspects of in-kind programs is how widespread and important they are. Table 1 provides some evidence regarding the percent of GDP that is devoted to five types of in-kind programs in OECD countries. The largest share of public in-kind spending is on health care, followed by education. But child care, housing, and active labor market programs are also important. Most countries have some form of food subsidy program (such as a school lunch program) as well, though the OECD does not track public expenditures on these programs so they are not included in table 1.<sup>2</sup> The key distinction is between unrestricted cash transfers and transfers that are intended to provide a specific good. A key assumption in the discussion that follows is that recipients cannot resell their allotments (at least not without substantial penalty). This may be ensured through government enforcement or because of the nature of the good (medical care or education). If people can resell their allocations, then the in-kind transfer becomes, for all practical purposes, the same as cash.

Table 2 focuses on one particular type of program—demand-side housing subsidies—and shows that many countries outside the

<sup>2</sup> In table 1, physical provision of a good, targeted subsidy programs in which the government pays some fraction of the market cost of the good, and vouchers are grouped together.

TABLE 1  
PUBLIC EXPENDITURES ON FOUR IN-KIND PROGRAMS, SELECTED OECD COUNTRIES

	Health %GDP 2002	Housing %GDP 2001	Child Care %GDP 2003	Education %GDP 2003	Active Labor Market %GDP 2001
Australia	6.1	0.1	0.4	4.7	0.1
Austria	7.6	0.1	0.6	5.1	0.1
Canada	6.7	..	0.2	5	0.4
Denmark	7.3	0.7	1.6	7.3	0.2
France	7.9	..	1.2	5.2	0.4
Germany	8.4	..	0.4	4.2	0.3
Greece	4.6	..	0.4	3.9	NA
Ireland	5.4	0.5	0.2	4.3	0.4
Japan	6.5	..	0.3	3.3	0.1
Netherlands	5.6	0.4	0.5	4.7	0.4
New Zealand	6.4	0.6	0.4	6.5	0.1
Norway	8.2	0.2	1	7.1	NA
Portugal	6.5	..	0.8	5.3	0.1
Spain	5.2	0.2	0.6	3.8	0.4
Sweden	7.7	..	1.2	7	0.2
United Kingdom	6.4	1.5	0.6	5	NA
United States	6.6	..	0.6	5.3	0.2

*Notes:* Dots indicate share is less than 0.1 percent of GDP. Child care also includes preprimary education. Education includes primary, secondary, and tertiary. Active labor market policies include, but are not limited to job training and search assistance.

*Sources:* OECD Health Data 2007—Version, July 2007,  
[http://www.oecd.org/document/30/0,3343,en\\_2649\\_37407\\_12968734\\_1\\_1\\_1\\_37407,00.html](http://www.oecd.org/document/30/0,3343,en_2649_37407_12968734_1_1_1_37407,00.html)  
 Emil Tesliuc, “Social Safety Nets in OECD Countries,” Social Safety Nets Primer Notes # 25,  
 World Bank, 2006.  
 OECD Family Data Base 2007, [www.oecd.org/els/social/family/database](http://www.oecd.org/els/social/family/database).  
 “Babies and Bosses: Reconciling Work and Family Life,” Vols. 1–4, OECD.

OECD also have long-standing programs. Evidently, it is more the norm than the exception for governments to conduct redistribution in-kind.

Table 3 provides more detail about the broad range of in-kind programs in one country: the United States. The table shows a breakdown of expenditures and caseloads for major transfer programs in the United States for 1980 and 2002. As table 1 showed, U.S. public expenditures on in-kind programs are in line with those of other countries (for instance, although the United States spent 14.3 percent of GDP on health care in 2002, public expenditure on health care was only 6.6 percent, which is quite similar to other OECD countries).

Table 3 illustrates several important points about transfers. First, total U.S. transfers are dominated by transfers to the elderly under the Social Security and Medicare programs. This is also true in other developed countries where, as in the United States, social security is one of the largest transfers and the costs of health care reflects disproportionate consumption by the aged. Moreover, in the United States, about half of the spending on Food Stamps and public housing programs also benefits the elderly. It is also likely that a significant fraction of publicly subsidized housing in other countries is occupied by the elderly, although this breakdown is not available. This simple fact casts some doubt

TABLE 2  
U.S. EXPENDITURES AND CASELOADS FOR SAFETY NET PROGRAMS, 1980 AND 2002

Cash	1980			2002	
	Expenditure (1980 billions)	Expenditure (2002 billions)	Caseload (millions)	Expenditure (billions)	Caseload (millions)
Temporary Assistance for Needy Families payments	12.0	26.2	10.6	11.1	5.1
Other TANF services	NA	NA	NA	13.4	NA
Earned Income Tax Credit	2.0	4.4	7.0	35.8	19.8
Total Supplemental Security Income (SSI)	7.9	17.2	4.1	34.6	6.8
SSI for children	NA	NA	[0.2]	[0.5]	[0.9]
Old Age and Disability Benefits	120.5	263.1	30.9	453.8	46.5
OASDI for Children	[10.3]	[22.5]	[3.3]	[20.4]	[3.9]
Unemployment Insurance	14.1	30.8	9.9	51.6	11.7
Health Care					
Total Medicare	35.0	76.4	28.5	256.8	40.0
Total Medicaid	23.3	50.9	21.6	213.5	49.8
Medicaid (dependent children and their adults)	[6.4]	[14.0]	[14.2]	[54.7]	[37.8]
State Child Health Insurance Program	NA	NA	NA	3.0	5.4
Nutrition					
Total Food Stamps	9.2	20.1	21.1	21.7	20.2
Food Stamps—families with children	[5.5]	[12.1]	[12.7]	[11.7]	[10.9]
School Lunch & Breakfast	3.3	7.2	14.9	8.4	22.7
Supplemental Feeding Program for Women, Infants, and Children	0.7	1.5	1.9	4.4	7.5
Housing					
Low-Rent Public Housing	2.2	4.8	NA	8.9	NA
Section 8 & other assisted rental housing	3.1	6.8	NA	20.0	NA
Homeless programs	NA	NA	NA	1.4	NA
Housing Block Grants	NA	NA	NA	1.8	NA
USDA Rural programs	NA	NA	NA	9.3	NA
Child Care					
Child Care and Development Block Grant	NA	NA	NA	7.9	1.8
Head Start	0.7	1.5	0.4	6.5	0.9
Education and Training					
Education					
Public primary/secondary	[101.7]	[222.0]	[40.9]	[448.9]	[48.2]
Public post-secondary	[25.2]	[55.0]	[9.5]	[81.2]	[12.2]
Financial aid	[10.3]	[22.5]	[8.0]	[55.5]	[17.8]
Job Training	3.2	7.0	1.2	2.1	0.9
Total		817.1		1751.6	
For Children (imputing 0.5 housing)		394.7		784.1	
For Children Percent In-Kind		86.5		92.6	

*Notes:* OASDI for Children figures are for 1985. Medicare enrollment figures are for 2001. Number of Food Stamp recipients under families with children is estimate based on table 15-10 that 60 percent of 1980 recipients had children and 54 percent of 2002 recipients had children. Figures for school nutrition programs include only free and reduced-price meals. The school lunch and breakfast figures may double count the number of children (also note that the Green Book's lunch table is wrong, replicating breakfast table). Caseload for CCDBG includes individuals affected by state-only programs. Public postsecondary figures are for 2001. EITC caseloads and housing caseloads are number of families, all others are number of individuals.

*Sources:* Green Book: 2004—tables 1-9, 1-11, 2-1, 2-2, 3-1, 3-11, 4-1, 7-6, 9-16, 9-26, 13-14, 15-11, 15-21, 15-22, 15-24, 15-25, 15-26, 15-27, 15-28, 15-31, 15-33, K-10 and chart 7-3; 1996—table 16-34; 1986—tables 7-1, 8-15.

Statistical Abstract of the U.S.: 2006—tables 232, 243, 265, 277; 1998—tables 310.

Annual Statistical Supplement: 2005—table 8.E2.

TABLE 3  
DEMAND-SIDE HOUSING SUBSIDY PROGRAMS AROUND THE WORLD: 1996

Region/Country	Type	Tenure	Dates
Latin America			
Chile	Grant	Owner	1978–
Costa Rica	Grant	Owner	1986–
Columbia	Grant	Owner	1991–
Uruguay	Grant	Owner	1991–
El Salvador	Grant	Owner	1991–
Paraguay	Grant	Owner	1991–
Western Europe			
Germany	Allowance	Owner/renter	1955–
Sweden	Allowance	Renter	1930–
UK	Allowance	Renter	1970–
Netherlands	Allowance	Renter	1970–
France	Allowance	Renter	1948–
Austria	Allowance	Renter	1960–
Switzerland	Allowance	Renter	1950–
Norway	Allowance	Owner/renter	1960–
Finland	Allowance	Owner/renter	1941–
Denmark	Allowance	Renter	1955–
Eastern Europe			
Poland	Allowance	Renter	1955–
Czech Republic	Allowance	Owner/renter	1993–
Slovakia	Allowance	Owner/renter	1997–
Estonia	Allowance	Renter	1994–
Latvia	Allowance	Renter	1994–95
Lithuania	Allowance	Renter	1994–
Ukraine	Allowance	Owner/renter	1994–
Russian cities	Allowance	Renter	1994–
Other			
Australia	Allowance	Renter	1945–
South Africa	Capital grant	Owner	1996–

Source: Katsura and Romanik (2002).

on the idea that in-kind transfer programs exist primarily to influence labor supply.

Second, Americans are more likely to give cash to the elderly than to other groups. About a third of overall transfer payments are made in cash. But if we exclude social security, the share of aid given in cash falls dramatically. Among families with children, very little aid is given in cash. In this respect, the United States is very different than Western European countries that typically give a larger fraction of their aid to families in cash.

Third, in the United States, the share of aid delivered in-kind has increased over time. Much of this increase is fueled by the rising cost of medical care delivered under the Medicare and Medicaid programs (Medicare covers the elderly while Medicaid is the U.S. program of public health insurance for poor women and children, the disabled, and indigent elderly who are not covered by Medicare). However, even abstracting from this, the share delivered in-kind has tended to increase. Between 1980 and 2002, unre-

stricted transfers to poor families with children fell dramatically (partly as a result of welfare reform) while most in-kind programs grew. Note that cash transfers made under the Earned Income Tax Program also grew, but these transfers require recipients to work and, thus, are tied transfers. The size and importance of in-kind transfers suggest that they are an important subject for research.

### 3. *The Traditional View of Transfers*

Assume preferences depend on two goods only: a composite consumption good,  $x$ , and a second good that is subject to in-kind transfers,  $g$ . Figure 1 depicts the potential outcomes under a food stamp program, or provision of free housing of a given size, assuming that the resale of the transfers is not possible (at any price). The original budget constraint is given by  $EF$ . Cash transfers shift the budget constraint upward to  $E'F'$ ; in-kind transfers of equal cost shift it to  $E'CF$  if topping up is allowed (as with food stamps), and to  $EC'CF$  if topping up is not possible (as with free housing). Clearly, with none of the points on  $CF'$  being available in the case of food stamps and, with the exception of point  $C$ , none on  $E'F'$  available in the case of free housing, cash weakly dominates in-kind transfers. The diagram depicts two different types of individuals under the food stamp program: those who are indifferent between the two transfer schemes (individuals moving from point  $A$  to  $B$ ) and those who are strictly better off under cash transfers (individuals who initially located at  $A'$  and would go to point  $B'$  under cash transfers but are constrained to stay at point  $C$  under in-kind transfers).<sup>3</sup> The diagram also shows that, under the free housing program, everyone strictly prefers cash transfers with the exception of the person who picks point  $C$  under cash transfers and thus will be indifferent between the two programs.

A particular feature of the solution under in-kind transfers, as described above, is that it can lead to the publicly-provided good being “overprovided” (the solution for food at point  $C$  in figure 1). The paternalistic and interdependent preferences arguments in favor of public provision center around this feature. Overprovision arises when the society prefers the recipient to consume more of good  $g$  than he would voluntarily (if we were to give him a cash transfer of equivalent value), as explained below.

#### 3.1 *Paternalism and Interdependent Preferences*

Paternalism is intimately related to the idea of merit goods and merit wants, and may be a key reason for government intervention. The idea was first suggested by Richard A. Musgrave (1959); it has received different interpretations in the literature. In one approach, the quantity of some goods directly enters the society’s social welfare function (see Elisha A. Pazner 1972). The social welfare function thus becomes nonindividualistic. This is a general formulation that also allows for the preferences of all, or a subset of, the society’s members to appear as arguments of the social welfare function. It is plain that this approach can rationalize in-kind redistribution of any good that the society considers as essential at any desired level.

Timothy J. Besley (1988) criticizes the social welfare approach to paternalism, arguing that it leads to a conflict with the notion of consumer sovereignty because individual preferences are no longer respected. In Besley’s formulation, goods do not enter the social welfare function directly. Instead, he uses a scaling approach wherein the social planner and the individuals assign different welfare weights to the individuals’ consumption of a particular good.<sup>4</sup> Lester C. Thurow

<sup>3</sup> See Henry J. Aaron and George M. Von Fürstenberg (1971), among others, for a detailed explanation of the superiority of cash- over in-kind transfers along this line.

<sup>4</sup> See also Fred Schroyen (2005) who questions Besley’s approach because of its implications for the tax treatment of merit goods.

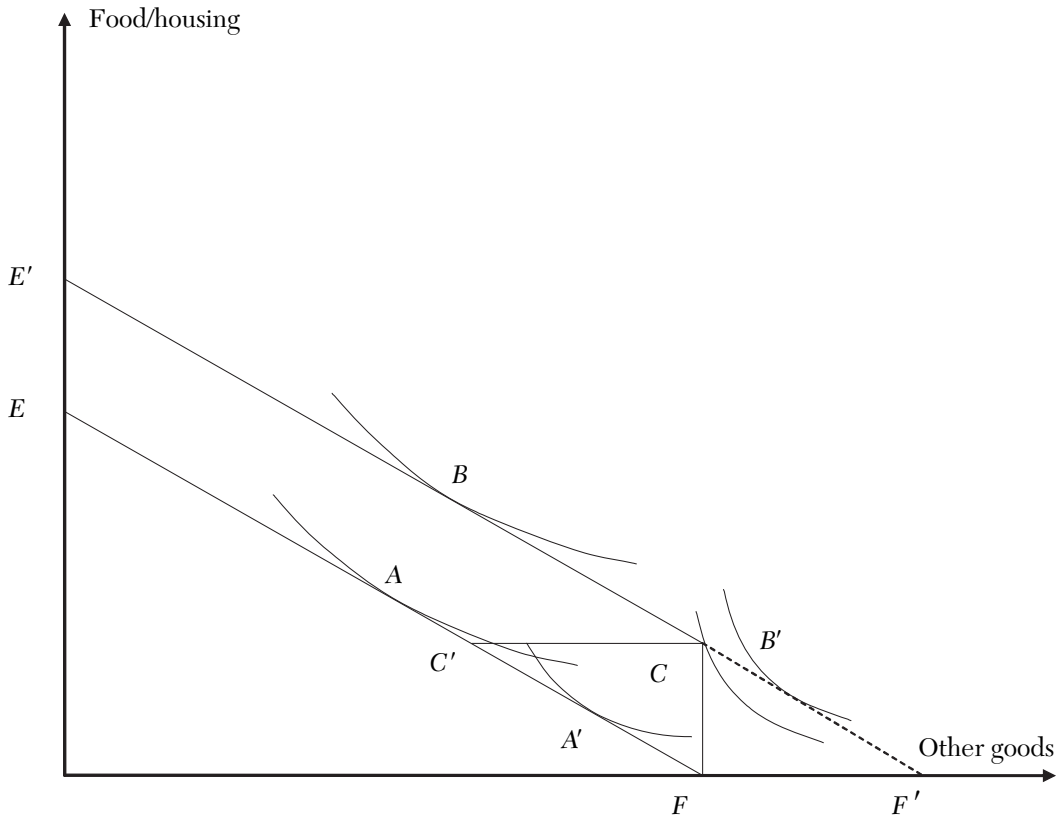


Figure 1. An Individual's Potential Choices before and after Receiving Food Stamps or Free Housing

(1974), on the other hand, argues that there need not be a conflict here because individuals may have “societal preferences” that are different from their personal preferences.

A third approach to modeling paternalism is to allow for interdependent preferences amongst the donors and the recipients. Under this interpretation, interdependent preferences give rise to a consumption externality that may justify public provision and the use of in-kind transfers. See the early contributions by George Daly and Fred Giertz (1972), Irwin Garfinkel (1973), Ryan C. Amacher and Todd Sandler (1977), and Edgar O. Olsen (1980).<sup>5</sup> This approach then allows one to pre-

serve the individualistic property of the social welfare function.<sup>6</sup>

Suppose the rich, who are taxed to provide benefits to the poor, derive utility from seeing the poor consume certain goods ( $g$  in our discussion). It is easy to see that in this case, the optimal in-kind transfers welfare dominate cash transfers. Assume the rich and the poor have preferences that are represented by

$$(1) \quad u^h = u^h(x^h, g^h; g^l),$$

<sup>6</sup> Although the contributors to this literature have at times postulated nonindividualistic social welfare functions in addition to interdependent preferences. For example, Browning (1981) defines paternalism as when the society caters for the preferences of the donors (taxpayers) but not the transfer recipients, while at the same time assuming that taxpayers care about the consumption of the transfer recipients.

<sup>5</sup> See also Edgar K. Browning (1975, 1977) and Geoffrey Brennan and Cliff Walsh (1977, 1980), who argue against this rationale.



$$(2) \quad u^l = u^l(x^l, g^l).$$

Let  $I^h, I^l$  denote  $h$ - and  $l$ -types' incomes and  $\pi^h, \pi^l = 1 - \pi^h$  their proportion in the population. Denote the social weight assigned to the utility of the rich by  $0 \leq \gamma^h \leq 1$ , and to the utility of the poor by  $0 \leq \gamma^l \leq 1$ , where  $\gamma^h + \gamma^l = 1$ . First-best allocations are found by maximization of  $\gamma^h u^h + \gamma^l u^l$  subject to the economy's resource constraint  $\sum_j \pi^j(I^j - x^j - pg^j) \geq 0$ . They are characterized by

$$(3) \quad \frac{\partial u^l / \partial g^l}{\partial u^l / \partial x^l} + \frac{\gamma^h}{\gamma^l} \frac{\partial u^h / \partial g^l}{\partial u^h / \partial x^l} = p,$$

$$(4) \quad \frac{\partial u^h / \partial g^h}{\partial u^h / \partial x^h} = p.$$

It is plain that lump-sum cash transfers cannot support such allocations. As long as the rich and poor face the same market price for  $g$ ,

$$\frac{\partial u^l / \partial g^l}{\partial u^l / \partial x^l} = \frac{\partial u^h / \partial g^h}{\partial u^h / \partial x^h}.$$

This in turn tells us that conditions (3) and (4) cannot hold simultaneously.

On the other hand, in-kind transfers support the optimal allocations (3) and (4). Assign  $g^h$  to the rich and  $g^l$  to the poor, ban resale and topping up (discussed below), and levy appropriate (differential) lump-sum taxes to finance the expenditures. It may also be possible, depending on the properties of the optimal solution, to implement it by providing  $g^l$  to the poor, and financing it by a tax on the rich, and letting the rich purchase whatever amount they want in the market.<sup>7</sup>

<sup>7</sup> As an example, assume  $p = 1$ ,  $\pi^h = \pi^l$ ,  $\gamma^h = 2\gamma^l$ ,  $I^h = 525$ ,  $I^l = 100$ , and

$$u^l = \ln x^l + \ln g^l, \\ u^h = \ln x^h + \ln g^h + \frac{1}{8} \ln g^l.$$

One can easily establish that the optimal allocations are  $x^h = g^h = 200$ , and  $x^l = 100$ ,  $g^l = 125$ . These can be implemented by imposing a tax  $T = 125$  on the rich to finance the provision of  $g^l = 125$ . The recipients would be overprovided, spending all their income  $I^l = 100$  on  $x$ . On the other hand, if one were to give  $T = 125$  to the poor in cash, they would spend the transfers and their own income equally on  $x$  and  $g$ , purchasing 112.5 units of each.

A related idea in the discussion of paternalism is the notion of specific egalitarianism. James Tobin (1970) argues that while many people have no problem with income inequality per se, they would like to see that all individuals receive adequate food, medical services, or housing. This idea accords certain goods a special place not shared by other goods. Similarly, Steven Kelman (1986) postulates that individuals have rights to certain specific things, not to the cash equivalent of these things (p. 59). These ideas lend themselves to a modeling that makes the social welfare function nonindividualistic, as well as to a modeling based on interdependent preferences.

Interpret specific egalitarianism to mean an aversion to inequality in consumption of  $g$ . One can then let  $g^h - g^l$  be an argument of the social welfare function or an argument of the rich's utility function. The latter interpretation results in a model very much like what we have postulated here except that  $u^h(x^h, g^h; g^l)$  is replaced by  $u^h(x^h, g^h; g^h - g^l)$ , with a negative relationship between  $u^h$  and  $g^h - g^l$ . This is what Leonardo C. Gasparini and Santiago M. Pinto (2006) do in a recent paper in which they justify their formulation on the basis of what they call equal opportunity and specific egalitarianism.<sup>8</sup>

Casey B. Mulligan and Tomas J. Philipson (2000) argue that the paternalism argument for in-kind transfers explains many other features of the U.S. transfer system, including the fact that poor people both pay taxes and receive transfers. If the object of the transfer system were only to redistribute resources, then it would be hard to understand this fea-

<sup>8</sup> Specifically, they model equal opportunity by assuming that both the rich and the poor derive utility from consumption goods and the quantity/quality level of education, but that the utility of the rich also depends negatively on the difference between the average educational attainment of the two groups. This makes their model indistinguishable from one with interdependent preferences (externalities). They extend their analysis to situations where taxation is costly as well, although the costs are modeled in an ad hoc fashion.



ture.<sup>9</sup> However, if the purpose of the transfer system is to shift the consumption of the poor away from some goods and toward merit goods, then it makes more sense that one would tax the poor to pay for in-kind benefits for the poor.

#### 4. *Imperfect Information and Self-Targeting*

Transfer programs may be universal or targeted. In universal programs, everyone is eligible for the same level of publicly provided services. The national health insurance provided in Canada and many European countries is a good example. In a targeted program, the good subject to transfers is provided to a selected group of people based on a publicly verifiable characteristic such as income. Tagging is a closely related concept—in many programs, benefits are offered to a group on the basis of immutable and observable characteristics such as old age, youth, or disability. Universal programs will evidently cover all needy persons, but at a cost of covering those who are not needy as well. This cost may be considerable. In contrast, targeted programs may well miss some needy individuals. Table 3 shows that most in-kind transfers in the United States are targeted to low income individuals. The big exception is Medicare, which is available to elderly people at all income levels.

A more recent justification for in-kind transfers is based on the idea that governments want to target for efficiency reasons but that they cannot accurately identify the poor individuals in need of help. Hence the government must rely on individuals to identify themselves and to indicate if they are rich or poor. If cash is offered, all individuals have an incentive to claim they are poor in order to receive it, making cash subsidies

an inefficient tool. But if in-kind transfers are used as the redistributive tool, they may serve as a separation device between the rich and the poor. This is the so-called self-targeting property of public provision.

To achieve self-targeting, one must offer the public a good that appeals only to the intended recipients. In some instances, the nature of the good may suffice to ensure this. In many other cases, everyone may want to consume the good subject to transfers and one cannot rely on the nature of the good to separate those who should receive it from those who should not. The trick to achieve self-targeting in these cases is to package the good in such a way as to impose (otherwise unnecessary) costs on the recipients (actual and potential). As long as the costs are calibrated to fall more heavily on the nontargeted group if they choose to participate, only the targeted group will be prepared to endure them and take up the good. The costs may be in terms of restrictions on quantity (housing with very low square footage) or on quality (housing, food, or education of low-quality) or on time (time-consuming application, workfare). Alternatively, the costs may be psychic costs, or stigma, as discussed by Robert A. Moffitt (1983).

The logic of this idea is similar to that underlying the taxation of low-wage earners in James A. Mirrlees's (1971) optimal income tax problem. In that model, as is well-known, the tax authority distorts the behavior of the low-ability people by taxing their marginal income, despite their being the intended beneficiaries of the tax system. The reason for the distortion is that it deters high-ability people from masquerading or mimicking the low-ability individuals. Albert L. Nichols and Richard J. Zeckhauser (1982) were the first to apply this idea to the provision of in-kind transfers. They argued that self-targeting could be achieved by increasing the cost of participation in such a way as to deter those the government does not want to participate (the rich) but not the intended recipients (the poor). The authors pointed out that imposing costs on participation allows gains in terms of

<sup>9</sup> The hard to understand statement applies to tax payments per se; marginal tax rates are a basic feature of Mirrlees's model even if the tax system is purely redistributive.

target efficiency (i.e., achieves more redistribution) as long as the costs affect the intended recipients less than the pretenders.

A body of literature has since developed on the subject of self-targeting of publicly provided goods (see Charles Blackorby and David Donaldson 1988, Besley and Stephen Coate 1991, 1992, Pinto 2004, and Firouz Gahvari and Enlinson Mattos 2007). The basic insight of this literature can be captured by considering a model much simpler than Mirrlees's. Assume an economy with two types of individuals, rich and poor. Normalize the population size to one. As previously, denote the rich and the poor by  $h$  and  $l$ , and the proportion of the  $h$ - and the  $l$ -types in the economy by  $\pi^h$  and  $\pi^l = 1 - \pi^h$ . Preferences depend only on consumption,  $x$ , and a good subject to transfers in kind,  $g$ . All goods are produced subject to a linear technology so that the producer price of  $g$  relative to  $x$  is fixed. Denote this price by  $p$ . Preferences are represented by the utility function  $u = u(x, g)$ , where we assume that  $u(\cdot)$  is a smooth and strongly quasi-concave function and increasing in all its arguments. Incomes, denoted by  $I^h$  and  $I^l$ , are exogenous.

Initial endowments allow the  $h$ -types to enjoy a higher utility level than the  $l$ -types. This laissez-faire solution with no government intervention is depicted by point  $B$  in figure 2. The government aims to redistribute resources away from the  $h$ -types and towards the  $l$ -types. If incomes were publicly observable, the government could achieve its redistributive aims by taking money from the rich and giving it to the poor. Given that incomes are exogenous, any redistribution achieved this way would be first-best. In figure 2,  $AC$  depicts the first-best utility possibility frontier.

In the absence of information on incomes,  $AC$  will in general be infeasible (with the exception of point  $B$ , of course). To determine the second-best allocations, we proceed as follows. To be most general, assume that personal consumption levels of  $x$  are not publicly observable. Denote the tax levied on the  $j$ -type by  $T^j$  ( $j = h, l$ ); one can then think of  $-T^j$  as the cash transfer to type  $j$ . Let

$$(5) \quad u^j \equiv u(I^j - T^j, g^j),$$

$$(6) \quad u^{jk} \equiv u(I^j - T^k, g^k), \quad j \neq k = h, l,$$

so that  $u^j$  denotes the utility level of a  $j$ -type individual when he chooses the allocation intended for him, and  $u^{jk}$  when he chooses a  $k$ -type person's bundle. Consider a direct revelation mechanism in which the government offers two bundles to the consumers:  $(T^h, g^h)$ , intended for the rich, and  $(T^l, g^l)$ , intended for the poor. Let  $\gamma^h$  and  $\gamma^l$  be non-negative constants with the normalization  $\gamma^h + \gamma^l = 1$ . The second-best allocations are found by maximizing  $\gamma^h u^h + \gamma^l u^l$  with respect to  $T^h, T^l, g^h, g^l$ , subject to the government's budget constraint,

$$(7) \quad \pi^h(T^h - pg^h) + \pi^l(T^l - pg^l) \geq 0,$$

and the incentive compatibility constraints,

$$(8) \quad u^h \geq u^{hl},$$

$$(9) \quad u^l \geq u^{lh}.$$

Observe that efficiency implies that we have a separating equilibrium.<sup>10</sup>

Denote the Lagrangian multipliers associated with the government's budget constraint (7) and the incentive compatibility constraints (8)–(9) by  $\mu$ ,  $\lambda^h$ , and  $\lambda^l$ . Assume that social welfare is concave such that in equilibrium the redistribution is from the rich to the poor implying that the self-selection constraint (9)

<sup>10</sup> Clearly,  $T^h = T^l$  combined with  $g^h \neq g^l$  cannot be an equilibrium, for otherwise everyone wants the bundle with the higher  $g$ . Similarly,  $T^h \neq T^l$  plus  $g^h = g^l$  is not an equilibrium as everybody will then want the bundle with the lower  $T$ . As to the bundles with  $T^h = T^l$  combined with  $g^h = g^l$ , they prevent one to attain the redistributive benefits (as there will be no redistribution). But such bundles entail an efficiency cost in that the rich and the poor will end up consuming different amounts of  $c$  and the same amount of  $g$ , so that they will have different marginal rates of substitution between  $c$  and  $g$ . (Marginal rates of substitution will be the same if preferences are quasi-linear. However, even in this case, redistribution is beneficial, unless the social welfare function is utilitarian, and that is lost under the pooling solution).

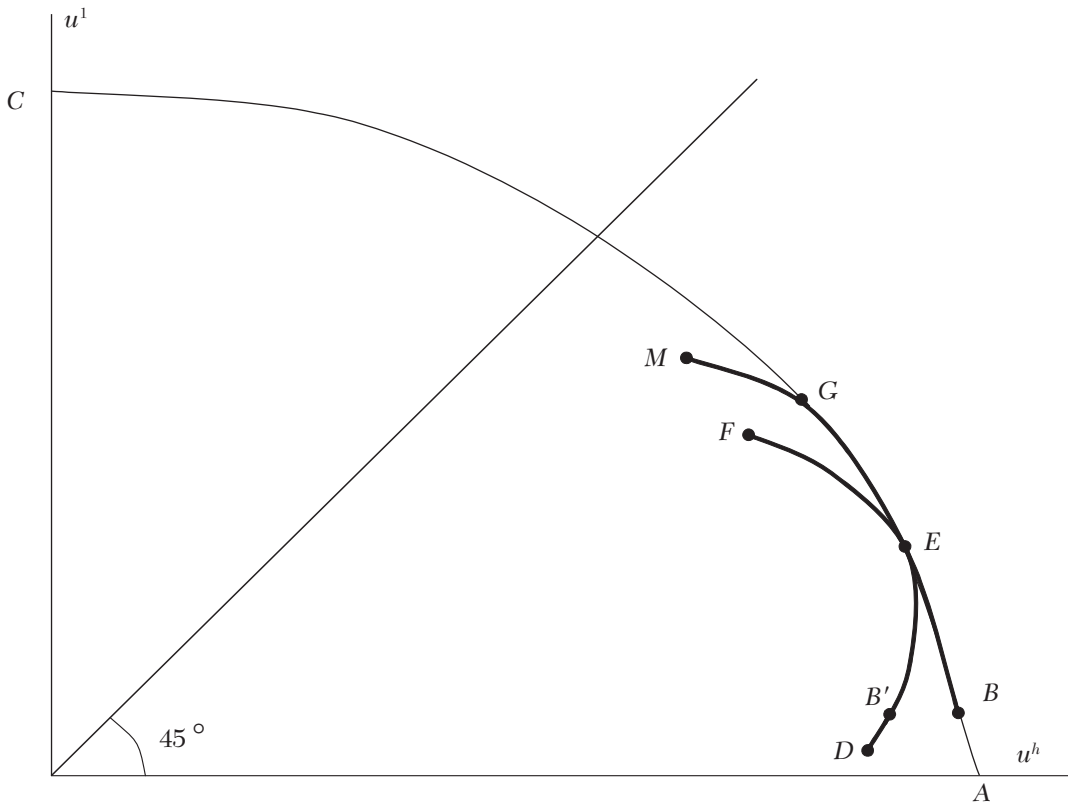


Figure 2. First-, Second-, and Third-Best Frontiers under Conditional Cash Transfers

is nonbinding ( $\lambda^l = 0$ ). One can then easily show, from the first-order conditions of this problem, that

$$(10) \quad \frac{u_g^h}{u_x^h} = p,$$

$$(11) \quad \frac{u_g^l}{u_x^l} = \frac{\mu\pi^l p + \lambda^h u_g^{hl}}{\mu\pi^l + \lambda^h u_x^{hl}} \\ = p + \frac{\lambda^h u_x^{hl} (u_g^{hl}/u_x^{hl} - p)}{\mu\pi^l + \lambda^h u_x^{hl}},$$

where a subscript under  $u(\cdot)$  denotes its partial derivative with respect to the specified

argument. It follows from (10) that the consumption decision of the rich should not be distorted in the second best. Moreover, if  $\lambda^h = 0$ , then  $u_g^l/u_x^l = p$ . Thus, when the extent of redistribution toward the poor is sufficiently limited, the consumption decision of the poor is not distorted either. The second-best allocations then coincide with the first-best. This is shown by locus  $BG$ , where point  $B$  is the initial no policy solution, in figure 2.

As  $\gamma^l$  increases, the poor's utility level increases along the first-best utility frontier attaining its highest value at the point where the incentive compatibility constraint of the rich starts to bind (point  $G$  in figure 2). As  $\gamma^l$  increases further, the redistribution will no longer occur on the first-best frontier.

This portion of the second-best frontier is depicted by the locus  $GM$ , where  $M$  is the point at which  $u^l$  reaches its maximum (corresponding to  $\gamma^l = 1$ ). Observe that the second-best utility frontier does not cross the 45 degree line: The after-transfer utility of the poor can never exceed the after-tax utility of the rich. We have:

$$u(I^l - T^l, g^l) < u(I^h - T^l, g^l) \leq u(I^h - T^h, g^h).$$

The first inequality follows from  $I^l < I^h$ , and the second from (8).

Along  $GM$ ,  $\lambda^h > 0$ . Moreover, with  $g^l$  being less than optimal for the rich,  $u_g^{hl}/u_x^{hl} > p$ . It then follows from equation (11) that  $u_g^l/u_x^l > p$ , calling for a less than efficient level of  $g^l$  in the second best. The intuition for a downward distortion in  $g^l$  comes from its impact on the rich's incentive compatibility constraint. The lower the quantity of  $g$  that is publicly provided, the less inclined the rich would be to covet the poor's allocation. To see this, note that the marginal rate of substitution ( $MRS$ ) of  $g$  for  $x$  is evaluated at  $(I^l - T^l, g^l)$  for the poor, and at  $(I^h - T^l, g^l)$  for the rich pretending to be poor. Consequently,  $MRS^{hl} > MRS^l$ , and lowering  $g^l$  would hurt the mimicker more than the poor.<sup>11</sup>

#### 4.1 No Topping Up and Implementation

Some in-kind transfers may be supplemented, or topped up, via market purchases. In the United Kingdom, people can receive medical treatment on a private basis (in addition to the services they are entitled to through the National Health Service). In other transfer schemes, topping up is not allowed. If a consumer wants to have

more of the good, or a different variety of it, he will have to opt out of the system: One can attend *either* a public school *or* a private school. Another example is the provision of housing of a specified size, location, etc. Someone who wants a different housing arrangement will have to forego free public housing.<sup>12</sup>

As presented above, the second-best solution is attained when one leaves the provision of  $g$  completely in the hands of the government. This need not be the case, however. Assume that  $g$  is a normal good but that it is provided subject to a no topping up restriction: To consume more, one has to forego the ration and purchase all one wants directly from the market (e.g., housing with certain square footage).<sup>13</sup> Then a policy of providing  $g$  for free to whoever wants it, while taxing those who participate in the program differently from those who do not, implements the second-best allocations. The government provides  $g$  at a level equal to  $\bar{g} = g^l$ , taxes the participants in the program by  $T_F^l$  and the nonparticipants by  $T^h - pg^h$  where the values of  $g^l$ ,  $g^h$ ,  $T^l$  and  $T^h$  are those determined in problem (7)–(9). Under this arrangement, and given that the second-best solution is a separating equilibrium, only the poor participates in the program. The  $h$ -types will

<sup>12</sup> The inability to top up may be a technical phenomenon or caused by institutional constraints. Goods which have to be consumed in whole or not at all (schooling, housing of a particular characteristic) can be improved but, technically, they cannot be topped up. On the other hand, setting an upper limit to the square footage of publicly provided housing or the coverage of a health plan is institutional. In the former type cases, public provision programs attempt to exploit the infeasibility of topping up. In the latter, the decision to allow topping up is endogenous and has to be determined as part of the provider's optimization problem. See Sören Blomquist and Vidar Christiansen (1998b).

<sup>11</sup> Observe, however, that a downward distortion exists relative to the poor's demand upon receiving the income transfer. That is, the poor would wish to purchase more of  $g$  if they were to receive the income equivalent of their net transfers in cash. The poor's consumption of  $g$  when it is provided publicly may very well exceed the level they would themselves purchase in the absence of any transfers.

<sup>13</sup> In Besley and Coate (1991) and Gahvari and Mattos (2007), the publicly provided good is an indivisible one, consumed either in whole or not at all. The good is packaged in different variants, each embodying a different level of quality  $g$ . The consumer can buy only one variant; different variants cannot be combined. This can be thought of as education packaged either as public or private schools (where extra tutorial classes will not be construed as a substitute for one or the other type of schools).

spend  $pg^h$  in order to consume  $g^h$ , rather than getting it from the government for free. However, they will be taxed  $pg^h$  dollars less so that their net income remains the same. Moreover, given that  $g^h$  satisfies equation (10), they will purchase precisely  $g^h$  when faced with price  $p$ .

Formally, let  $x(p, I^j)$  and  $g(p, I^j)$  denote the  $j$ -type's demand functions for  $x$  and  $g$ , if he were to purchase the goods from the market. These correspond to type  $j$ 's maximizing  $u(x, g)$  subject to  $x + pg = I^j$  and yield the indirect utility function  $v(p, I^j) \equiv u(x(p, I^j), g(p, I^j))$ . To get the poor to choose the public ration and the rich to buy  $g$  from the market, the following incentive compatibility constraints must be satisfied:

$$(12) \quad v(p, I^h - T^h) \geq u(I^h - T^l, \bar{g}),$$

$$(13) \quad u(I^l - T^l, \bar{g}) \geq v(p, I^l - T^h).$$

Moreover, as long as only the poor participate in the public provision scheme, the government's budget constraint is given by

$$(14) \quad \pi^h T^h + \pi^l T^l = \pi^l p \bar{g}.$$

One can easily check that this problem yields the second-best allocations.

The Pareto-superiority of the public provision scheme comes from the fact that the second-best solution cannot in general be decentralized through a pure tax/transfer policy. Decentralization requires public observability of personal purchases of  $g$  (i.e., who buys how much)—a type of information that the tax authority does not generally have. If it did, one would not need to rely on in-kind transfers to implement the second-best solution derived from problem (12)–(14). A combination of differential consumption taxes and differential income taxes would suffice. Specifically, this is achieved by  $T^h, T^l$  [set at the same values as in problem (12)–(14)], in combination with a

tax on  $g^l$  equal to  $u_g^l/u_x^l - p$  as given by (11), and with no tax on  $g^h$ .<sup>14</sup>

#### 4.1.1 Price Subsidies and Third Best

It is often the case, however, that  $g^h$  and  $g^l$  are not observable at a personal level. One can then tax  $g^h$  and  $g^l$  only uniformly and the solution will end up to be a universal cash transfer program and third best. To see this, observe that with both types facing the same commodity tax rate  $\tau$ , the incentive compatibility constraints are

$$v(p + \tau, I^h - T^h) \geq v(p + \tau, I^h - T^l),$$

$$v(p + \tau, I^l - T^l) \geq v(p + \tau, I^l - T^h),$$

which imply that  $T^h = T^l$ —a universal cash transfer program. Observe also that this problem is the second-best problem with the added restrictions that  $T^h = T^l$ , and  $MRS^h = MRS^l$ . Consequently, its solution will be third best.

#### 4.2 Link with the Literature

The second-best solution described above is identical to Gahvari and Mattos's (2007) solution presented in terms of conditional cash transfers where the recipients of in-kind transfers also receive a certain amount of cash from the government. Thus the poor receive not just a good with quality level  $\bar{g}$ , but  $\bar{g}$  plus the conditional cash transfer  $t$ , and everybody pays the same lump-sum tax,  $T$ .

In Besley and Coate (1991), individuals are offered  $\bar{g}$ , but everybody is taxed at the same rate  $T$ . Once again there will be a self-targeting solution, albeit a less efficient one. To derive Besley and Coate's solution, simply impose the restrictions  $T^l = T, T^h = T + pg^h$  on problem (12)–(14)

<sup>14</sup> The consumption of  $x$  is from one's endowment and not taxable. Otherwise, one could impose uniform tax rates on consumption of all goods and rebate the proceeds equally to the poor and rich. This would yield a first-best outcome.



above. Alternatively, the bundles could be  $(T, g^l)$  for the poor and  $T$  for the rich (who will then be allowed to purchase  $g$  freely from the market). The feasible utility distributions under this latter scheme constitute third-best allocations and are depicted by  $DB'EF$  in figure 2. (These are different from the third-best allocations discussed in 4.1.1). Point  $D$  corresponds to the *minimum* value of  $\bar{g}$  that satisfies the poor's incentive compatibility constraint (13) assuming  $T^l = T$  and  $T^h = T + pg^h$ . Observe, however, that at this point the poor are worse off than in the absence of the transfer policy. In order for the poor to be at least as happy as they would be without the government transfer policy, one must have  $u(I^l - T, g) \geq v(p, I^l)$ . When this is satisfied as an equality, the distribution of utilities is given by  $B'$ . Finally, point  $F$  corresponds to the distribution of utilities when  $g$  attains its maximum level such that the incentive compatibility constraint for the rich (12) is satisfied (with  $T^l = T$  and  $T^h = T + pg^h$ ).

Observe that the third-best frontier  $DB'EF$  will have at most one point in common with the first-best frontier (which will then also be a common point with the second-best frontier). This point is denoted by  $E$  in figure 2. The level of  $\bar{g}$  at this point is found from  $g^* = g(p, I^l + \pi^h pg^*)$ .<sup>15</sup> The two frontiers will necessarily have a common point if  $g^*$  is smaller than the maximum value of  $g$  that satisfies the incentive compatibility constraint for the rich given by (12). This is the case depicted in figure 2.<sup>16</sup> Moreover, given that the rich do not

participate in the transfer program and purchase their most-preferred bundle from the market,  $g^*$  must be first best.

In Blackorby and Donaldson (1988), the unobservability of preferences takes the center stage. Nevertheless the informational issues and the corresponding first-, second-, and third-best solutions have the same properties as in our discussion in section 4 to the end of subsection 4.1. One exception is that their second-best solutions—those that are not also first best—appear to be the opposite of the ones we derived here. Blackorby and Donaldson's second-best solutions are characterized by *overprovision* of in-kind transfers, as opposed to the *underprovision* result we derived above. This is, in fact, not surprising and rather intuitive; both results arise from the same principle that underlies our result. In Blackorby and Donaldson, one type (Able) derives utility only from consumption goods and the other (Infirm) from consumption goods and the publicly provided good. Their second-best solutions are characterized by redistribution from Able to Infirm, with Infirm preferring more of the publicly provided good (the Able consumes none). Because  $MRS^{AI} < MRS^I$ , where  $A$  stands for Able and  $I$  for infirm, an upward distortion makes it less desirable for Able to mimic the Infirm. In our setting, redistribution was from the rich ( $h$ ) to poor ( $l$ ); and because  $MRS^{hl} > MRS^l$ , a downward distortion made it less desirable for  $h$  to mimic  $l$ .

Other considerations come to play also when the government provides more than one publicly provided good. In many devel-

<sup>15</sup> The poor receive  $p\bar{g}$  in kind and pay  $T = \pi^l p\bar{g}$  in taxes; the monetary value of the net transfer to a poor individual is thus  $p\bar{g} - \pi^l p\bar{g} = \pi^h p\bar{g}$ . At  $\bar{g} = g^*$ , the poor are indifferent between receiving one extra dollar in cash and one extra dollar worth of the publicly provided good. At this point,  $u_g^l/u_x = p$ . Moreover, if  $\bar{g} < g^*$ ,  $u_g^l/u_x > p$  and  $\bar{g}$  is less than efficient; while if  $\bar{g} > g^*$ ,  $u_g^l/u_x < p$  and  $\bar{g}$  is more than efficient.

<sup>16</sup> On the other hand, it is possible for  $g^*$  to be larger than the maximum feasible value of  $g$ . Under this circumstance,  $DB'EF$  will not touch the first-best frontier and attains its highest  $u^l$  level at its intersection with  $GM$  (see

figure 2 in Gahvari and Mattos 2007). Observe also that while  $g^*$ , whether larger or smaller than the maximum feasible value of  $g$ , is efficient from the perspective of the poor, it does not result in the maximal utility for them. The point is that  $g^*$  would maximize their utility (they would choose it voluntarily) *provided* that the size of their net transfer is constant. This is not the case here. The poor receive a net transfer of  $\pi^h p\bar{g}$  which directly increases with  $\bar{g}$ . In effect, a one unit increase in  $\bar{g}$  will cost the poor  $p - \pi^h p = \pi^l p$  instead of  $p$  (which would be the case if net transfers were constant). It should not then be surprising to find that the poor's utility would increase if  $\bar{g}$  exceeds  $g^*$ .

oping countries, for example, the poor are represented more heavily in elementary schools than in high schools and universities. Consequently, to enhance target efficiency, the government should spend more resources on basic education rather than on higher education.

### 5. *Targeting and Take up in Practice*

It is difficult to come up with examples of large-scale transfer programs that are purely self-targeted. Rather than being required to consume the in-kind transfer in order to get cash, recipients of cash transfers in the United States are often automatically eligible for a range of in-kind benefits: Welfare recipients are also entitled to Food Stamps, Medicaid, and priority for housing assistance. This way of organizing programs implies that the authorities first observe and verify income, and then give benefits in kind, which would seem to rule out self-targeting as the primary reason for supplying benefits in-kind, at least among the welfare population. Moreover, although there may be elements of the program that are designed to get recipients to self-select in or out of the program, the authorities still generally expend considerable resources determining eligibility and most recipients are required to document their eligibility at regular intervals (which is in many cases a major barrier to takeup).

Many developing countries have adopted conditional cash transfer programs in recent years. These may seem like the programs described above. However, in most of these programs, the authorities first determine who is eligible for the program and then offer benefits, so that take-up of the in-kind program does not assist targeting.

Two prominent examples of this genre are *Bolsa-Escola* in Brazil and the *Progres*a program in Mexico. Under *Bolsa-Escola*, families received a monthly stipend for each child enrolled in public schools (Francois Bourguignon, Francisco H. G. Ferreira, and Phillippe G. Leite 2002). Mexico's *Progres*a

distributes nutritional supplements in addition to cash and is conditioned on school attendance as well as regular health check-ups. Similar programs exist in Bangladesh, Colombia, Honduras, Jamaica, and Nicaragua (see Laura B. Rawlings and Gloria M. Rubio 2005 for a survey). New York City has recently announced an experimental conditional cash transfer program modeled on *Progres*a. Poor families will receive a passport detailing the amounts they will receive for compliance with various program goals, such as keeping their children in school and taking them for checkups (Diane Cardwell 2007). It is possible that the nutritional supplements offered under *Progres*a are a sufficiently inferior good that they help to identify the neediest people (but that is an empirical question). It seems more likely that such programs are justified by paternalism (after all, they prescribe the behavior that must be followed for people to receive benefits), by the Samaritan's dilemma discussed in section 10.1 below or by politics in countries in which the rich do not wish to give cash transfers to the poor.

Another difficulty is that one would generally need to know who the intended recipients and nonrecipients are to know whether a particular program has been successfully self-targeted. For example, Sweden has universally available public child care for young children, which is widely used. Some parents still prefer, however, to hire nannies for child care. Should we say that because a very small number of people opt out of the public program, that it is successfully self-targeted?

Self-targeting is sometimes presented as an explanation for program rules that are burdensome to applicants—for example, application procedures may require many trips to the welfare office or intrusive unnecessary questions (for example, in some U.S. states, Food Stamp applicants are asked to document whether they own burial plots even though the value of a burial plot cannot be counted as an asset in the determination of eligibility). It is difficult to prove that rules that make applying for welfare programs



TABLE 4  
FOOD PROGRAMS IN DEVELOPING COUNTRIES,  
TYPES AND EXTENT OF LEAKAGES

Type	Extent of Leakage
1. Untargeted Food Subsidies (Egypt (early 1980s), Morocco, Tunisia, Yemen, Brazil)	High
2. Untargeted Food Rations (ration shops) (India, Pakistan)	High
3. Targeted Food Rations (ration shops) (Brazil, India)	Low
4. Self Targeting Food Rations (Bangladesh, Pakistan, Thailand)	Low
5. Food Stamps Targeted by Income (Columbia, Sri Lanka)	Low–Moderate
6. Food Stamps Targeted by Health Status (Columbia, Indonesia, Honduras)	Low
7. Targeted Feeding Programs (Dominican Republic, Columbia, Pakistan)	Low
8. Supplementation Schemes, on-site or take-home (India, Indonesia)	Moderate
9. Supplementation Schemes, on-site, targetted to neediest. (India, Tamil Nadu)	Low
10. Food-for-work (Bangladesh, India, Indonesia)	Low–Moderate
11. Rations Linked to Training Program (Bangladesh)	Low

*Source:* Alderman, 2002. Leakage refers to the extent to which benefits go to those who are not needy.

difficult improve targeting. Instead, targeting rules often tend to exclude the neediest potential recipients because they are the ones who have the most difficulty complying with program rules.

Table 4, which is adapted from Harold Alderman (2002), describes food programs available in a number of developing countries, some of which are self-targeted. The table suggests that both self-targeted programs and programs that are targeted in other ways are generally successful in avoiding leakages of food to unintended recipients. However, the success of the self-targeting programs

comes at a cost. Hanan G. Jacoby (1997) discusses a Jamaican program that provided a free bland lunch supplement. Fewer than 60 percent of children participated in the program, and lower income people were much more likely to participate than higher income ones. However, using an estimate of equivalent variation, he concludes that, while it cost \$400 per year to provide the supplement, households valued it at about \$158 per year. Therefore, even though the program seemed to be successfully targeting the neediest children by offering a good of low quality, there was a large deadweight loss associated

with the fact that the good was unattractive. The general lesson here appears to be that successful targeting is not a sufficient condition for the program to be economical or efficient.

The best examples of self-targeted programs may be training programs for the unemployed. Programs like the New Deal for the Unemployed in the United Kingdom tie receipt of cash benefits to participation in in-kind programs. The New Deal made participation in job training programs compulsory for many groups of unemployed.<sup>17</sup>

### 5.1 *Take up Problems*

If authorities wish to target programs (rather than have universal programs) and self-targeting is not possible, certain problems will surface with respect to program take up. If it is easy to get on the program, too many of the nontargeted people may take up benefits, and if it is hard to prove eligibility for the program, many eligibles may be erroneously screened out. Janet Currie (2006a) surveys the literature regarding take up of programs in the United States and the United Kingdom and finds that take up rates vary widely even for programs offering similar benefits. For example, take up of U.S. public health insurance programs for child birth has been quite high (35 to 40 percent of all U.S. births are now paid for by the Medicaid program), while many eligible pregnant women fail to take up pre-

natal care benefits (Marilyn Rymer Ellwood and Genevieve Kenney 1995). And take up among newly eligible children is thought to be quite low (8 to 14 percent).

Since income and age cutoffs for these programs were raised at different rates and different states, there is a great deal of variation in the rules that can be used to identify the effects of making children eligible for public health insurance. Papers that examine take up typically first compute whether or not a child of a given age in a given state and year was eligible for Medicaid and then regress coverage on eligibility. One problem with this procedure is that families can take steps to make themselves eligible by reducing their incomes. Currie and Jonathan Gruber (1996a, 1996b) deal with this problem by instrumenting individual eligibility with the fraction of a fixed national group of children who would be eligible under the state's laws. This instrument can be thought of as a summary statistic for the generosity of the state's law, which does not depend on individual income. Another approach that can be applied in panel data is to estimate eligibility using income from a base period (see Gruber and Kosali Simon 2007). The reason that delivery is so much more likely to be covered than prenatal care or care of older children is that hospitals have an incentive to assist eligible mothers who are delivering to enroll. Otherwise, the hospital is required to provide emergency care to women in labor, regardless of the woman's insurance status.

High take up of Medicare forms an interesting contrast to low take up of Medicaid among the nonelderly. There is almost 100 percent take up of the optional Medicare Part B program that covers outpatient services. The reason this is surprising is that people must pay premiums for Part B Insurance, even though these premiums are highly subsidized. A key difference between the two programs is that when people turn 65 years old, they have to file a form in order to decline Part B coverage, whereas people have to go

<sup>17</sup> Education and health services are not the only examples of low quality goods that developing countries provide publicly for the benefit of their poor. Low quality foodstuff is another example. The government of Tunisia subsidizes the provision of such goods in a way that only the poor households will want to consume them. Another variant of these schemes links public provision of one good to another (rather than linking cash to goods). In Bangladesh and Philippines, for example, school children receive free food if they attend school. Mexico's Progreso also provides nutritional supplements to people who visit health centers. In these schemes, food works as a substitute for cash inducing the recipients to go to school and/or to have health checkups (who otherwise may not want to do so).

through a complicated process in order to get Medicaid coverage. Thus, it seems to be the difference in the costs of applying that lead to the differences in take up rates. Currie (2006b) suggests a possible solution to the problem of reaching the neediest with targeted programs. One could offer a universal programs with sliding fees payable through the tax system, and also offer individuals the freedom to opt out of the universal program through either an administrative procedure or payment of higher fees. One could argue that the current system of public schooling operates this way in many countries.

There is a great deal of evidence that potential recipients of in-kind transfers are sensitive to application costs. Currie (2000) finds that the Medicaid enrollment of immigrant children increases with family size, suggesting that it is benefits relative to enrollment costs that matter. Rebecca M. Blank and Patricia Ruggles's (1996) study of participation in cash welfare (the Aid to Families with Dependent Children Program) and food stamps (the U.S. Food Stamp Program) showed that participation increased with the size of the benefits people were eligible for, which would not be the case if enrollment was costless (or if there were no stigma). Beth Osborne Daponte, Seth Sanders, and Lowell Taylor (1999) conducted a randomized experiment and found that informing people about their eligibility for the Food Stamp Program increased the probability of participation. However, people eligible for larger benefits were more likely to take them up, once again suggesting a nontrivial role for transactions costs/stigma. Currie and Jeffrey Grogger (2001) focus directly on transactions costs and show that reducing recertification intervals had a negative effect on participation in the Food Stamp Program, particularly among single heads and people in rural areas, both groups that might be expected to have relatively high transactions costs.

Aaron S. Yelowitz (1996) provides evidence that altering enrollment requirements for one program can have spillover effects onto the

enrollments in other programs. He estimates that, for every ten newly eligible families who took up Medicaid benefits, four also took up the Food Stamp Program. A likely explanation is that both programs were handled by the same welfare offices, so that it is more worthwhile to bear the application costs when applying for Medicaid and the Food Stamp Program together than for the Food Stamp Program alone. Conversely, reductions in the U.S. welfare caseload have impacted enrollments in other programs. Sheila R. Zedlewski and Sarah Brauner (1999) and Currie and Grogger (2001) find that reductions in cash welfare reduced enrollment in the Food Stamp Program. Since most people who left welfare remained eligible for the Food Stamp Program, the main reason they left the rolls is likely to be because they were no longer automatically eligible for the Food Stamp Program when they lost cash welfare.

John Bound, Sherrie Kossoudji, and Gema Ricart-Moes (1998) have a particularly striking result. They find that in Michigan, two-thirds of the people applying for Social Security Insurance (SSI, a social insurance program for the disabled) in 1990 and 1991 had just been kicked off of General Assistance (a program for the indigent). The benefits available under SSI were always much higher than those available under General Assistance but it is more difficult to qualify for SSI. Apparently, many people who were eligible for both programs registered only for General Assistance when that was an option because they were unwilling to bear the cost of applying for SSI.

## 5.2 *Do Nonfinancial Barriers Screen out the Right People?*

These observations about the importance of enrollment costs and other nonfinancial barriers to participation raise the question of whether the nonfinancial barriers screen out the right people? That is, are the various administrative requirements attached to

these transfer programs targeting benefits to the neediest eligibles?

In many cases, attempts to answer these questions are hampered by the fact that we do not have a precise measure of who is eligible. For example, in the case of SSI, we need to know not only that someone is low income but also that they are disabled, a concept that is socially determined. Hugo Benitez-Silva, Moshe Buchinsky, and John Rust (2004) look at classification errors in disability insurance programs under the assumptions that (a) the individual's report to the Health and Retirement Survey about their disability status is the truth and (b) that both the government's assessment of the individual's disability status and the self-report are noisy but unbiased measures of true disability. Under either assumption, they find that 28 percent of the applicants who are ultimately awarded benefits are not disabled (by their own survey reports), while 61 percent of the applicants whose applications are denied are actually disabled.

Similarly, William J. Reeder (1985) finds that the poorest households are less likely than slightly better off households to live in public housing in the United States, perhaps because the most vulnerable households have difficulty getting through the application process. On the other hand, some programs do seem to serve the neediest applicants. For example, Head Start, which is required to serve the neediest children first, seems to fulfill this mandate. This may be because Head Start programs are required to set out specific criteria for identifying and enrolling needy children.

Households may be receiving aid when they do not appear to be eligible, but it is important not to assume that all of these households are in violation of program rules. Recertification intervals provide a potential reason for households with incomes above thresholds to be on public assistance. We know, for example, that households tend to seek public assistance when their income is unusually low (c.f., Orley Ashenfelter 1983).

In this case, we might expect household income to rise mechanically after program enrollment. Since families tend to be certified for benefits for a fixed period, such a pattern might lead us to observe many families in a cross section who participated in a public program even though their incomes were somewhat above the eligibility threshold.

The question of whether benefits have been correctly targeted to those in need has recently been exhaustively studied in the case of the Medicaid program. Many authors have attempted to judge the extent to which expansions of the Medicaid program to additional groups of pregnant women and children led to increases in the take up of public insurance by the target group—people who would otherwise have been uninsured. These authors have also attempted to gauge the extent to which the Medicaid expansions led people who would otherwise have had private insurance to take up Medicaid. The latter phenomena has been dubbed “crowd out.”

The Medicaid expansions led to dramatic increases in the fraction of children eligible for public health insurance (Currie and Gruber 1996a, 1996b). But it led to much smaller increases in the fraction of children covered by any health insurance because of declines in the fraction of children covered by private health insurance. However, private health insurance coverage has also been falling among groups that one would not expect to be affected by the Medicaid expansions, such as single men. Thus, it is not obvious to what extent the relationship between increases in public insurance and decreases in private insurance is causal, although it seems clear that a significant amount of crowd out has occurred (see the discussion in Gruber and Simon 2007).

There is also a large literature about crowd out in the context of public housing programs (see Olsen 2003). The typical questions are whether government construction crowds out private construction and whether housing subsidies affect private rents. For example,

Todd Sinai and Joel Waldfogel (2002) conclude that two units of privately constructed housing are crowded out for every three units of government housing that are provided and that subsidies may be more effective than government construction.

### 5.3 *Is Low Take up an American Problem?*<sup>9</sup>

Low take up of social programs is often perceived as a peculiarly American problem because of the United States's heavy reliance on means-tested programs in its social security system. Peter Craig (1991) provides a survey of take up in the United Kingdom, which is updated in Currie (2006a). They conclude that many U.K. programs also exhibit less than full take up. Estimates of take up of the Working Families' Tax Credit (which is similar to the American Earned Income Tax Credit or EITC) by single mothers range from 67 to 81 percent, which is comparable to John Karl Scholz's (1994) estimates of 80 to 87 percent for the EITC. Take up of Income Support among nonpensioners, which (at least for lone mothers) corresponds roughly to Temporary Assistance for Needy Families, seems to be higher in the United Kingdom than in the United States, although at 80 percent, is still much less than full. Take up of Income Support for pensioners (which corresponds to SSI for the elderly) is somewhat higher than in the United States at between 64 and 78 percent, but again is much less than 100 percent.

These rough comparisons suggest that perhaps more attention should be paid to factors determining take up of social benefits outside the United States. It is interesting to note that the one U.K. program with near universal take up is the Child Benefit. Mothers receive the application materials for this program in hospital, which presumably greatly reduces application transactions costs.

The discussion of social benefits in the United Kingdom might also lead us to think beyond the question of who takes up pro-

grams to whether recipients make optimal use of programs that they have taken up and if not, why not? Research on the National Health Insurance program suggests that, although there is universal take up, the rich receive more services than the poor, conditional on their health status. Possible reasons range from higher transactions costs (e.g., lack of transportation or inability to take time off from work), superior connections and communication skills and/or better rapport with medical providers, and differences in attitudes toward illness and medical care (Anna Dixon et al. 2003). It is possible that the same factors that inhibit take up may also affect utilization of social programs.

### 5.4 *Other Perspectives on Take Up*

A newer focus of the take up literature concerns the extent to which networks play a role in decisions about take up. Marianne Bertrand, Erzo F. P. Luttmer, and Sendhil Mullainathan (2000) show that a woman's propensity to use welfare increases with the number of coethnics in the area, if those coethnics are from a group that has a high propensity to use welfare nationally. However, as Charles F. Manski (2000), William A. Brock and Steven N. Durlauf (2001), Moffitt (2001), and others have highlighted, these correlations could reflect several different things: an endogenous effect in which the propensity of an individual to behave in a particular way was causally influenced by the behavior of other members of the group, an exogenous effect in which the individual's behavior is influenced by an exogenous characteristic that defines group membership, or a correlated effect in which individuals from the same group tend to behave the same way because they have similar individual characteristics or face similar constraints. Using data on utilization of publicly sponsored prenatal care, Anna Aizer and Currie (2004) show that, when they estimate a model similar to that of Bertrand et al., they also find a



large network effect in the utilization of public prenatal care services. But when they control for the hospital of delivery, these effects disappear. This finding suggests that what looks like an interactive network effect may actually be the result of external constraints that dictate which hospital a woman living in a given area chooses. That is, some hospitals may simply be more welcoming to women from different groups.

Finally, the importance of transactions costs suggests some scope for the application of behavioral economics. Ted O'Donoghue and Matthew Rabin (1999) argue that people tend to put more weight on the present than on the future when making decisions. Their model allows for this feature by adopting hyperbolic rather than exponential discounting. The model has an obvious application here, in that many of the costs of enrolling in social programs are borne immediately, whereas the benefits are in the future. Hence, a person with time-inconsistent preferences might put off enrolling in the program, even though he would find it utility maximizing to have enrolled as a participant at a later date. This might be particularly true of programs such as public health insurance, where the benefits might not even be needed unless a future health shock occurs.

## 6. *Improving Tax Efficiency Through Labor Supply: I*

A basic tenet of the optimal tax literature à la Mirrlees is that the tax authorities do not typically have information on taxpayers' types but that the taxpayers' incomes are publicly observable. Section 4's assumption of income exogeneity prevents one from investigating the implications of this informational structure for the question of cash versus in-kind transfers. That assumption identifies types—earning abilities—with incomes, so that observability of types and incomes become one and the same. In order to examine the implications of these two very different informational structures, we drop

the income exogeneity assumption in this section.

If types were publicly observable, all first-best optima would be attainable through differential lump-sum taxes and there would be no role for in-kind transfers. The unobservability of types rules out differential lump-sum taxes just as section 4 did. But the observability of incomes now implies that we have a tax instrument which we did not have before; namely, the *differential* taxation of incomes. At first, one may think that this new tax instrument makes in-kind transfers redundant. But this will not be the case. The crucial point is that, given an income tax, the economy is in a second-best environment. And we know from Roger Guesnerie and Kevin W. S. Roberts (1984) that, in such environments, forced consumption or rationing can be Pareto improving. The role of in-kind transfers in a second-best setting is to alleviate the existing excess burden of the tax system while achieving the same amount of redistribution.

In the presence of an income tax, public provision can potentially stimulate labor supply, something that cash transfers cannot do. This should not be surprising in light of the depressing, and distorting, effect of income taxation on labor supply. To the extent that this is possible, increases in labor supply will enhance the government's aggregate income tax revenues, enabling the government to undertake more expenditures and to raise everybody's welfare. The degree of complementarity between labor supply and publicly provided goods becomes the crucial determining factor here.

The basic insight for this result is most easily grasped by assuming that the income tax structure is linear. We shall study this case below and then turn to the more general framework of nonlinear income taxation in the following section.

### 6.1 *Linear Income Taxes*

Assume the income tax structure is linear and that it is set optimally (to maximize

a concave social welfare function).<sup>18</sup> Denote the lump-sum element of the linear income tax by  $s$ , and the tax rate by  $\theta$ . There are again two types of individuals: one with low earnings ability, or wages, and the other with high earnings ability. Denoting the former with  $l$  and the latter with  $h$ , we have  $w^l < w^h$ . For each  $j$ -type person, let  $w^j$  denote the wage and  $g^j$  the demand for the good subject to in-kind transfers in the absence of transfers. That is, let

$$g^j = g(p, w^j(1 - \theta), s), \quad j = l, h.$$

Suppose we give each person  $g^j$  and finance it by reducing that person's cash transfers,  $s$ , by the amount  $pg^j$ . It is plain that this switch leaves the initial solution unchanged. Consider now what happens to the  $j$ -type's welfare if we increase the allotment of  $g$  from  $g^j$  by a very small amount  $\varepsilon$  while reducing the transfer  $s$  by  $p\varepsilon$ . Guesnerie and Roberts (1984) provide a general framework to address this question. The *direct* effect of this change on the utility of the  $j$ -type is zero because, ex hypothesis, the level at which the change is evaluated is optimal. Thus the only welfare effect which need concern us is what happens to tax revenues. Gahvari (1994) proves that this effect is positive as long as  $g$  and labor supply are Hicks complements.<sup>19</sup>

The theory of the second-best provides another intuition for this result. Income taxation leads to a lower than optimal supply of labor through its substitution effect. When in-kind transfers and labor supply are Hicks complements, pushing in-kind transfers above the level that the recipients would

buy for themselves, if given the value of the transfers in cash, enhances labor supply and offsets the existing labor supply distortion. Hence, despite the distortion that public provision creates—by forcing the recipients to consume a different amount than they would have consumed voluntarily—it can, on balance, be Pareto improving.

Alistair Munro (1992) and Gahvari (1995) discuss how a Pareto-improving in-kind transfer policy can be organized in this framework. Munro's approach is based on the idea of self-targeting discussed in section 4 where topping up is not feasible. Assume  $g$  is a normal good. Set the level of in-kind transfers the recipients would receive at  $g^l + \varepsilon$ , and charge recipients less than  $p(g^l + \varepsilon)$ , with the difference being covered by the increase in government tax revenues that will follow (as argued above). The nonparticipants continue to face the same linear income tax schedule as before. Under this scheme, low-ability persons will be better off participating. High-ability persons, on the other hand, will not participate as they continue to prefer their allocation under the linear income tax. This follows because initially, with only the linear income tax in place, they preferred their own allocation *strictly* to that of the low-ability individuals.

Gahvari (1995) considers a universal program and allows for topping up. The public provision is again set at  $g^l + \varepsilon$ . Now everybody participates, with the high-ability persons topping up their consumption.<sup>20</sup> Observe that because the extra tax revenues generated by the higher labor supply of the poor is now used to finance the transfers received by everyone, this policy will be less redistributive than the self-targeting one. To offset this, one may think of boosting the labor supply of the rich as well, in order to increase the

<sup>18</sup> Although the income tax *rate* is the same for both types, income tax revenues collected will not be.

<sup>19</sup> Observe that, in this framework, there always exists one good whose provision by the public sector will be Pareto improving. This follows because leisure must have at least one Hicks substitute (labor supply must have a Hicks complement). See also Michael P. Murray (1980) and Michael V. Leonesio (1988) on the relationship between public provision and labor supply and J. Peter Neary and Roberts (1980) for a general discussion of demand under rationing.

<sup>20</sup> If  $g$  is set just above the demand of the high-ability individuals, the poor will have to consume more  $g$  than before which reduces their utility. Whether or not such a policy is welfare improving depends on how this negative direct utility effect balances out the positive welfare effects of spending the extra tax revenues.



tax revenues they generate. Such a scheme requires the government to offer different amounts of  $g$  to the two types ( $g^l + \varepsilon$  to the poor and  $g^h + \varepsilon$  to the rich). This is inconsistent with the simple framework of a linear income tax; however. We return to this issue in the next section where we allow the government to levy a general income tax.

Note that instead of public provision, one can rely on *price subsidies* to stimulate labor supply. Indeed, subsidizing  $g$  relative to  $x$  encourages *everybody's* consumption of  $g$ , and with it, *everybody's* labor supply (assuming  $g$  and labor supply are complements, of course). This is the positive aspect of price subsidies. Moreover, the fact that the rich also receive subsidies does not necessarily mean that the tax system is less redistributive. The government can adjust the linear income tax structure to ensure that redistribution is not diminished. All of this follows, of course, from the optimal tax literature. In the presence of an income tax, differential commodity taxes are useful unless preferences are weakly separable in labor supply and other goods, with the subutility of the other goods being homothetic (see Angus Deaton 1979).<sup>21</sup>

### 7. Improving Tax Efficiency through Labor Supply: II

When individuals' incomes are publicly observable, there is no informational reason to restrict the income tax structure to be linear; the government is able to levy a nonlinear income tax schedule. It is then natural to ask if there continues to be a role for in-kind transfers in the presence of this more versatile income tax instrument. The past decade has seen the development of a literature around this very question. As with the linear income tax case, the literature considers two

types of policies. One follows Munro (1992) and considers in-kind transfers with no topping up possibility designed for take up by the poor only (see Blomquist and Christiansen 1995, 1998b). The other, Blomquist and Christiansen (1998a, 1998b), Robin Boadway and Maurice Marchand (1995), Helmuth Cremer and Gahvari (1997), and Boadway, Marchand, and Motohiro Sato (1998), follow Gahvari (1995) and discuss a universal public provision scheme.<sup>22</sup> The main message of this literature remains the same as with the linear income tax systems. In-kind transfers enhance the efficiency of the tax system, or its redistributive effectiveness, via their stimulating effect on labor supply.

In-kind transfers that disallow topping up are self-targeted whether or not incomes are endogenous. As such, they supplement tax instruments for the purpose of separating the more able and the less able individuals, as in the self-targeting literature we reviewed in section 4. To be sure, that literature, by ignoring the distinction between ability and income, severely limited the role of tax instruments and used in-kind transfers more as a substitute for the income tax system. Nevertheless, as we demonstrate below, in-kind transfers enhance the separating property of even a well-designed nonlinear income tax system. And they can do this most effectively when in-kind programs are complements to labor supply.

Universal provision programs are not self-targeted in that both the poor and the rich participate in them. Nevertheless, they increase the redistributive power of the income tax system (for the same excess bur-

<sup>21</sup> Deaton and Nicholas Stern (1986) have generalized this result by allowing Engel curves to have different intercepts while the government is able to make differential lump-sum grants conditioned on observable household characteristics.

<sup>22</sup> Boadway and Marchand (1995) and Cremer and Gahvari (1997) examine the usefulness of public provision in a model with a general income tax. Cremer and Gahvari, in contrast to Boadway and Marchand, also allow for commodity taxes and price subsidies. Blomquist and Christiansen (1998a) compare price subsidies alone with public provision alone and Boadway, Marchand, and Sato (1998) discuss under what conditions publicly provided goods should be subsidized when purchased in the market. Blomquist and Christiansen (1998b) compare welfare properties of in-kind transfers with and without topping up.

den). Thus, the additional redistribution is targeted toward the low-ability persons. And, unless there are other reasons for providing aid in a particular form, what is important is the extent of redistribution itself. Their effectiveness, as we show below, rests also on their being complements to labor supply.

The mechanism through which public provision achieves more redistribution is the same for targeted and universal programs. To see this, recall that in the two-group version of Mirrlees's (1971) model, which is one of pure taxation, redistribution from the high- to low-ability types is maximal when the high-ability type (rich) is just about to mimic the low-ability type (poor). For in-kind transfers to be welfare improving, they have to enable the government to undertake more redistribution than was possible under Mirrlees's solution (for the same excess burden). This can be done if public provision hurts the mimicker without hurting the poor (or hurts the mimicker more than the poor). If doable, the scheme reduces the rich types' informational rent—a surplus that can be transferred to the poor.

Now one can always hurt the mimicker more than the poor via a self-targeted program as long as the mimicker and the poor want to consume different levels of the good subject to transfers,  $g$ , at Mirrlees's optimum. However, given that the mimicker and the poor differ only in their labor supplies, the extent to which their desired consumption levels differ depends crucially on the degree of complementarity between labor supply and  $g$ . The higher the degree of complementarity, the greater the difference between the desired consumption levels, and the more effectual public provision will be.

The potential redistribution of a universal program is less obvious. To effect more redistribution, one has to impose a *minimum* consumption level of  $g$  on the recipients. Achieving more redistribution then requires this minimum consumption level to be less pressing for the poor than for the rich pretending to be poor (to force the mimicker, but not the poor, to consume more  $g$  than desired). This can be

done if the mimicker's demand for  $g$  is lower than that of the poor person's at the Mirrlees's optimum. Then, one can set  $g$  at a level above the mimicker's, but lower than the poor person's, demand. Now, to identify what goods can usefully be provided on a universal basis, recall that, at the Mirrlees's optimum, the mimicker has a lower labor supply than the poor (he has a higher wage but the same income). One then asks: Under what circumstances would the mimicker have a lower demand for  $g$  than the poor, given that the mimicker has a lower labor supply? The answer is when  $g$  and labor supply are complements.

Before studying these questions in more detail, we note an existing result from the optimal income tax literature that pinpoints a circumstance under which in-kind transfers, targeted or universal, are redundant.

### 7.1 *Weakly Separable Preferences in Labor*

Anthony B. Atkinson and Joseph E. Stiglitz's (1976) celebrated result teaches us that if preferences are weakly separable between labor supply and consumption goods, and identical for all consumer types, Pareto efficient allocations—constrained by self-selection—can be implemented through a general income tax alone. That is, commodity taxes are not needed. An implication of this is that public provision will also be unnecessary.<sup>23</sup>

Observe, however, that the available econometric studies do not support the labor separability assumption (see, e.g., Browning and Costas Meghir 1991). Thus, in practice, one can not reject the usefulness of in-kind transfers on the basis of Atkinson and Stiglitz's result even if the tax policy is optimally designed. Observe also that what

<sup>23</sup> A version of this proposition is demonstrated in Aanund Hylland and Zeckhauser (1979). In their specification, publicly provided goods are not modeled explicitly. Preferences depend only on labor supply and post-tax income, with the benefits from in-kind transfers being subsumed in post-tax income in terms of their market values. As a result, labor supply has essentially the same complementarity or substitutability relationship with all goods, privately or publicly provided.

is crucial for the Atkinson and Stiglitz result to hold, i.e., for consumption taxes to be redundant, is that the marginal rate of substitution between any two goods is the same for the mimicker and the mimicked. When the only source of heterogeneity is skills, the equality of the marginal rates of substitution will be guaranteed by weak-separability of preferences. If there is more than one source of heterogeneity, as in Cremer and Gahvari (1995, 1998, 2002), Cremer, Gahvari, and Norbert Ladoux (1998), Cremer, Pierre Pestieau, and Jean-Charles Rochet (2001), and Emmanuel Saez (2002), weak separability of preferences in labor supply is no longer sufficient for this result. The implication for in-kind transfers is that they may remain useful even in the face of weak-separability of preferences.

## 7.2 Nonseparable Preferences

Observe first that while we allow for income taxes to be nonlinear, we do not do this for commodity taxes. This is the most commonly adopted assumption in the optimal tax literature, based on what is regarded to be the most reasonable informational structure in the economy. The rationale for it is that public observability of individuals' incomes, which allows incomes to be taxed nonlinearly, is quite a bit less demanding informationally than the observability of *personal* consumption levels required for nonlinear taxation of goods. Tax administrations typically have no information on personal consumption levels, at least not for all commodities. What one may reasonably assume to be available to them, is information on *anonymous* transactions (rather than on who purchases how much). Under this circumstance, nonlinear commodity taxation is not feasible; only linear commodity taxes are available.<sup>24</sup>

Let preferences be represented by  $u(x, g, 1 - L)$  where  $x$  and  $g$  are defined as above,

$L$  denotes labor supply, and the time endowment is normalized to one. We continue to assume that the society is comprised of only two groups of people: high- and low-ability individuals, and that  $u(\cdot)$  is a smooth and strongly quasi-concave function, and increasing in all its arguments. Consider, as in Cremer and Gahvari (1997), an optimal revelation mechanism that consists of a set of type-specific before-tax incomes,  $I^j$ , aggregate expenditures on goods,  $c^j$ , and a vector of commodity taxes (the same for everyone). As usual, homogeneity of degree zero of demands in consumer prices, and supplies in producer prices, allows us to normalize both producer and consumer prices. One can then normalize the commodity tax rate on  $x$  to zero, deriving the commodity tax on  $g$  only. The mechanism assigns  $(t, c^j, I^j)$ , where  $t$  is a unit tax on  $g$ , to a household who reports type  $j$ ; the consumer then allocates  $c^j$  between  $x$  and  $g$ .<sup>25</sup>

Introduce a type-specific utility function:  $u^j(x, g, I) \equiv u(x, g, 1 - I/w^j)$ ,  $j = h, l$ , with  $w^h > w^l$ . Given any vector  $(t, c, I)$ , an individual of type  $j$  ( $j = h, l$ ) solves

$$(15) \quad \max_{x, g} u^j(x, g, I)$$

$$(16) \quad \text{subject to } x + (p + t)g = c,$$

where  $p$  is the producer price of  $g$ . The resulting demand functions are denoted by  $x^j(p + t, c, I)$ ,  $g^j(p + t, c, I)$ , and the indirect utility function by  $v^j(p + t, c, I) \equiv u^j(x^j(p + t, c, I), g^j(p + t, c, I), I)$ . Note that these functions are defined for a given value of  $I$  and thus for a given level of labor supply (equal to  $I/w^j$ ).

Assume, as is common in the literature, that at the optimum only the incentive constraint of high-wage individuals is binding.

<sup>24</sup> For example, any attempt to tie-in commodity tax rates to the quantity purchased can easily be foiled by multiple purchases or asking others to make one's purchases.

<sup>25</sup> This procedure determines the commodity tax rate right from the outset. A complete solution to the optimal tax problem then requires only the design of a general income tax function. Observe also that, strictly speaking, this procedure does not characterize allocations as such; the optimization is over a mix of quantities and tax rates.

Intuitively, this means that the tax policy involves redistribution from high- to low-wage individuals.<sup>26</sup> The government's problem can then be written as

$$(17) \quad \max_{t, c^h, I^h, c^l, I^l} v^h(p + t, c^h, I^h) + \mu v^l(p + t, c^l, I^l)$$

subject to

$$(18) \quad v^h(p + t, c^h, I^h) - v^h(p + t, c^l, I^l) \geq 0,$$

$$(19) \quad \pi^h[I^h - x^h(p + t, c^h, I^h) - pg^h(p + t, c^h, I^h)] + \pi^l[I^l - x^l(p + t, c^l, I^l) - pg^l(p + t, c^l, I^l)] - \bar{R} \geq 0,$$

where  $\bar{R}$  is the government's external revenue requirement and  $\mu$  is a positive number. Use a hat over variables to denote the solution to this problem and define, for  $j = h, l$ ,

$$(20) \quad \hat{x}^j = x^j(p + \hat{t}, \hat{c}^j, \hat{I}^j), \\ \hat{g}^j = g^j(p + \hat{t}, \hat{c}^j, \hat{I}^j), \\ \hat{v}^j = v^j(p + \hat{t}, \hat{c}^j, \hat{I}^j).$$

The constrained Pareto efficient allocation is given by  $(\hat{x}^h, \hat{g}^h, \hat{I}^h, \hat{x}^l, \hat{g}^l, \hat{I}^l)$ . It can be implemented by the indirect tax  $\hat{t}$  together with a general income tax.

For future reference, we let

$$(21) \quad \hat{x}^{hl} = x^h(p + \hat{t}, \hat{c}^l, \hat{I}^l), \\ \hat{g}^{hl} = g^h(p + \hat{t}, \hat{c}^l, \hat{I}^l),$$

<sup>26</sup>The single-crossing property (the indifference curves going through any point  $(c, I)$  being flatter for the high-wage than the low-wage person) ensures that the upward incentive constraint is nonbinding when the downward constraint binds. This property is guaranteed if  $c$  is a normal good. The equilibrium will then be characterized by  $I^h > I^l$  and  $c^h > c^l$  (see Stiglitz 1987).

denote the amount of goods  $x$  and  $g$  that an individual of type  $h$  who wished to imitate a low-wage individual would consume. Corresponding to  $\hat{x}^{hl}$ ,  $\hat{g}^{hl}$ , we also define

$$(22) \quad \hat{v}^{hl} = u^h(x^h(p + \hat{t}, \hat{c}^l, \hat{I}^l), g^h(p + \hat{t}, \hat{c}^l, \hat{I}^l), \hat{I}^l) = v^h(p + \hat{t}, \hat{c}^l, \hat{I}^l),$$

to denote the maximum utility attainable by an  $h$ -type who mimics an  $l$ -type person.

### 7.2.1 Self-Targeted Public Provision

Append the mechanism  $(\hat{t}, \hat{c}^h, \hat{I}^h, \hat{c}^l, \hat{I}^l)$  by giving  $\bar{g}$  units of good  $g$  to anyone who reports  $\hat{I}^l$ . No one is allowed to resell any part of an allotment or to top it up. Additionally, each recipient faces a uniform lump-sum tax of  $(p + \hat{t}) \bar{g}$ . The recipients thus end up consuming  $\bar{g}$ , as well as  $\bar{x}$  units of the private good equal to

$$(23) \quad \bar{x} = \hat{c}^l - (p + \hat{t}) \bar{g}.$$

The nonrecipients' optimization problem is as before and is given by equations (15)–(16).

It is plain that if the government sets  $\bar{g} = \hat{g}^l$ , the low-ability individuals' consumption bundle remain as it was under the initial income tax system. Similarly, the consumption bundle of the high-ability individuals will remain the same, as they will choose not to participate in the program (they chose their own bundle over the low-ability individuals' bundle under the pure tax scheme). The mimickers, on the other hand, will experience a reduction in their utility level as long as  $\hat{g}^{hl} \neq \hat{g}^l$ . Consequently, the previously binding self-selection constraint (22) slackens and the government will be able to undertake further redistribution. Observe that no other requirement is necessary here except for  $\hat{g}^{hl} \neq \hat{g}^l$ . However, given that the high- and low-ability persons have identical preferences, we have  $\hat{g}^{hl} = g(p + \hat{t}, \hat{c}^l, \hat{I}^l/w^h)$  and  $\hat{g}^l = g(p + \hat{t}, \hat{c}^l, \hat{I}^l/w^l)$ , with  $\hat{I}^l/w^h < \hat{I}^l/w^l$ . Thus, the degree of complementarity between

labor supply and  $g$  determines how far apart  $\hat{g}^{hl}$  and  $\hat{g}^l$  are. The higher the degree of complementarity, the greater will be the difference between  $\hat{g}^{hl}$  and  $\hat{g}^l$  and the more effectual will be public provision in relaxing the initially binding self-selection constraint.

The above argument shows only the existence of Pareto-improving in-kind transfers; it does not characterize them. Blomquist and Christiansen (1995) catalogue different possible regimes and describe the properties of optimal solutions under each.<sup>27</sup> They show that there exists a regime under which high- and low-ability individuals receive consumption bundles that differ in  $(c, I)$  as well as in  $g$ . This regime can be implemented through a means-tested program where participation in the program is conditioned on one's observed income. However, they also show the possibility of a regime wherein  $h$ - and  $l$ -types end up with consumption bundles that differ in  $(c, I)$  but not in  $g$ . This regime implies participation by both groups and the suboptimality of offering a means-tested program. This is in sharp contrast with the self-targeting programs with exogenous income in which participation by both the poor and the rich is never optimal (as argued in section 4).

Taste differences between high- and low-ability persons can enhance or undermine the effectiveness of self-targeting programs. Assume  $g$  is normal such that when tastes are identical we arrive at a self-targeting equilibrium where only the  $l$ -types participate. The  $h$ -types prefer to buy a higher quantity of  $g$  from private markets than the  $\bar{g}$  they can receive for free from the government (alternatively, instead of a higher quantity, one can think in terms of a higher quality). Now take the same economy but assume that individuals' taste for  $g$  and ability are positively correlated. Consider the position of the mimicker in this latter economy at the self-targeting equilibrium

of the former economy with identical tastes. The mimicker's valuation of the  $h$ -types' bundle, relative to the  $l$ -types' bundle, must now be higher (because the  $h$ -types' original bundle contains more  $g$ , the good the mimicker now values more). Consequently, the value of  $v^h - v^{hl}$  increases and the binding self-selection constraint  $v^h \geq v^{hl}$  at the equilibrium with identical tastes slackens. One can then effect more redistribution by increasing  $g$  from  $\bar{g}$ . On the other hand, assume a negative correlation between taste for  $g$  and ability. The mimicker would now strictly prefer the original  $l$ -types' bundle to the original  $h$ -types' bundle (because it contains less  $g$ ). To prevent mimicking, the amount of  $g$  that is being provided should now be reduced.<sup>28</sup>

### 7.2.2 Universal Public Provision

Amend the mechanism  $(\hat{t}, \hat{c}^h, \hat{I}^h, \hat{c}^l, \hat{I}^l)$  by adding a universal in-kind transfer program that provides  $\bar{g}$  units of good  $g$  to individuals of both types. The good cannot be resold, and the program imposes a uniform lump-sum tax of  $(p + \hat{t})\bar{g}$  on everyone who receives  $\bar{g}$ . Given  $(\hat{t}, \hat{c}, \hat{I})$  and  $\bar{g}$ , the individual of type  $j = h, l$ , will now solve

$$(24) \quad \max_{x, g} u^j(x, g, \hat{I})$$

$$(25) \quad \text{subject to } x + (p + \hat{t})(g - \bar{g})$$

$$= \hat{c} - (p + \hat{t})\bar{g} \equiv c,$$

$$(26) \quad g \geq \bar{g}.$$

The problem (24)–(26) imposes a minimum consumption level for  $g$  on the participants. It may then be possible to manipulate this restriction in such a way as to relax the binding self-selection constraint of the original problem (17)–(19) and to effect Pareto improvements. Cremer and Gahvari (1997) prove that this will be the case provided that

<sup>27</sup> There are no commodity taxes in their model though.

<sup>28</sup> Cremer and Gahvari (2002) discuss nonlinear pricing in a model where tastes and abilities are correlated.



the following relationship holds at the solution to the Mirrlees's pure optimal tax problem,

$$(27) \quad \hat{g}^{hl} < \min[\hat{g}^h, \hat{g}^l].$$

The Pareto-improving policy sets  $\bar{g} = \min[\hat{g}^h, \hat{g}^l] - \varepsilon$ , with  $\varepsilon > 0$  and sufficiently small to ensure  $\bar{g} > \hat{g}^{hl}$ , so that mimickers, but not the actual participants, are forced to consume an amount of  $g$  that exceeds their desired level, and further adjusts the tax policy. It is important to realize that an element of the initial vector of taxes,  $\hat{t}$ , may be a subsidy (or a tax) on  $g$ .

To shed light on the nature of commodities that satisfy condition (27), consider high-wage persons who misrepresent their type. They will earn the low-wage person's income but will work less. High and low-wage persons have, by assumption, identical preferences. Consequently, because of their different labor supplies, the mimickers' marginal rate of substitution between  $x$  and  $g$  will differ from the low-wage individuals' marginal rate of substitution (at the latter's desired consumption level). Specifically, the mimickers' lower labor supply results in a lower marginal rate of substitution between  $x$  and  $g$ , and thus a lower demand for  $g$ , provided that  $g$  is complementary to labor. This is indeed what condition (27) requires. Hence the goods that are complements to labor are prime candidates for public provision.<sup>29</sup>

<sup>29</sup> This result, which requires the satisfaction of condition (27), is general in that it holds regardless of the number of consumption goods. When there are only two goods  $x$  and  $g$ , it will always be possible to effect Pareto improvements through public provision whether or not condition (27) is satisfied (except, of course, if preferences are separable in labor and other goods). This is achieved by supplementing the mechanism  $(p + \hat{t}, \hat{c}^h, \hat{I}^h, \hat{c}^l, \hat{I}^l)$  with the uniform public provision of  $g$  at the level  $g^* = \min[\hat{g}^h, \hat{g}^l] + \varepsilon$ , with  $\varepsilon > 0$  and sufficiently small to ensure  $g^* < \max[\hat{g}^h, \hat{g}^l]$ . This policy entails (i) no change in the utility level of either type and hence aggregate welfare as long as both persons find it best to tell the truth. [One of the two will supplement  $g^*$ , the other one will now consume an amount of  $g$  that exceeds his original optimal level. However, the extra

Finally, our result here points to the general superiority of a universal public provision program over (linear) price subsidies. Blomquist and Christiansen (1998a) compare two suboptimal configurations when they show that under certain special circumstances a price subsidy alone may be superior to public provision alone. Their result also requires that price subsidies benefit high-ability persons significantly. Boadway, Marchand, and Sato (1998) discuss the conditions under which the good subject to transfers should also be subsidized when purchased in the market.

### 7.3 Topping Up or Opting Out

That targeted and universal in-kind transfers are both welfare enhancing raises an interesting question. How do their welfare properties compare? Blomquist and Christiansen (1998a) provide some partial answers to this question. However, there are no general results here. Indeed, there are no general results on the characterization of the optimal universal public provision policies.

One particular result is that topping up allows taxpayers to achieve a higher, or the same, level of utility if public provision and labor supply are complements in the sense that the marginal valuation of  $g$  increases with one's supply of labor. To see the intuition for this result, assume that initially there is a no-topping-up restriction in place

consumption is infinitesimal and the individual remains on his original budget constraint. His utility thus remains unchanged.] (ii) The self-selection constraint  $u^h(x^h, g^h, I^h) \geq u^h(x^{hl}, g^{hl}, I^l)$  is satisfied. [In the absence of transfers, this constraint binds at  $(\hat{x}^h, \hat{g}^h, \hat{I}^h, \hat{x}^{hl}, \hat{g}^{hl}, \hat{I}^l)$ . We showed above that public provision leaves the left-hand side unchanged. As to the right-hand side, for the same before- and after-tax income, an increase in actual consumption of  $g^l$  over  $\hat{g}^l$  (whether  $j = h$  or  $l$ ) cannot make it more appealing for an  $h$  to mimic an  $l$  type.] (iii)  $dR = \hat{t}\pi^k\varepsilon$ , where  $k$  is the type with the lowest demand for  $g$ . Consequently, this policy is Pareto improving if  $\hat{t} > 0$ . On the other hand, if  $\hat{t} < 0$ , a similar argument would show that public provision of  $x$ , at a level just above the lowest demand for it, rather than of  $g$ , would be Pareto improving. See Cremer and Gahvari (1997).

and that we have an optimal solution with the government providing  $\bar{g}$ . Now relax this constraint and increase the income tax of every new participant by the cost of purchasing  $\bar{g}$ ,  $(p + \hat{t})\bar{g}$ . It is plain that this change leaves the utility of the new participants unchanged and the government's budget constraint in balance. As far as the initial participants are concerned, they will either remain put (so that their utility remains unchanged as well) or supplement their ration by buying more (in which case, their utility increases). What remains to be determined is what happens to the incentive compatibility constraint.

There are two possible initial outcomes. First is the possibility that the initial recipients of  $\bar{g}$  were the  $h$ -types. Under this circumstance,  $u^h$  will never decrease. As to  $u^{hl}$ , with  $l$ -types being the new participants,  $u^{hl}$ , like  $u^l$ , would remain the same. Consequently, we will have either the initial equilibrium or a Pareto superior one.

Next assume that the initial recipients of public assistance were the  $l$ -types. Because  $h$ -types are now the new participants,  $u^h$  remains unchanged. To determine what happens to  $u^{hl}$ , distinguish between the following two cases: (i)  $g^{hl}(\cdot) \leq \bar{g}$  and (ii)  $g^{hl}(\cdot) > \bar{g}$ , where  $g^{hl}(\cdot)$  denotes the mimicker's most-preferred consumption level of  $g$ . Under (i), removing the no-topping-up constraint does not make the mimicker any better off so that  $u^{hl}$  remains the same. The new policy is thus incentive compatible. Now consider the case where initially  $g^{hl}(\cdot) > \bar{g}$ . Here, removing the no-topping-up constraint means that the welfare of the mimicker can be improved by consuming more  $g$  than the previous ration of  $\bar{g}$ . This implies that the originally binding self selection constraint  $u^h \geq u^{hl}$  will be violated at the initial equilibrium because of the topping up. One can nevertheless show that the initial bundle can be adjusted in such a way as to lead to a Pareto improvement.

The adjustment takes the following form. Upon relaxing the no-topping up constraint and imposing a tax of  $(p + \hat{t})\bar{g}$  on the new participants, i.e., the  $h$ -types, levy an income

tax on the  $l$ -types as well. The amount of the tax should be sufficient to leave the mimicker indifferent between the new allocation and the self-targeting solution. This is denoted by  $\delta c$  and determined from the following equality,  $u^h(x(c^l + (p + \hat{t})\bar{g} - \delta c, p + \hat{t}), g(c^l + (p + \hat{t})\bar{g} - \delta c, p + \hat{t}), I^l) = u^h(c^l, \bar{g}, I^l)$ . This new tax on the  $l$ -types leaves the  $h$ -types unaffected and is, by construction, incentive compatible. It is also feasible in the sense that it increases the government's tax revenue by  $\delta c$ .

What remains to be determined is the  $l$ -types' utility. The complementarity assumption between  $g$  and labor supply implies that the  $l$ -types' valuation of  $g$  at  $\bar{g}$  is higher than the mimickers'. (Recall that the  $l$ -types and the mimickers have a pre-tax income of  $I^l$  which implies that  $l$ -types supply more labor.) It also implies that relaxing the no-topping-up constraint increases the  $l$ -types' consumption of  $g$  by more than it does the mimickers' consumption. Consequently, the  $l$ -types experience an increase in their utility that exceeds the change in mimickers' utility. Given that the latter change is zero, the  $l$ -types must be better off.

#### 7.4 Nonlinear Commodity Taxes and Subsidies

Finally, consider the implication of dropping the assumption that only the information on anonymous transactions is available to the government. Assume instead that *personal* consumption levels are publicly observable.<sup>30</sup> Given this informational structure, tax systems will be constrained by self-selection only. The set of consumption tax instruments need not then be restricted to be linear; the informational structure allows them to be arbitrarily nonlinear. This is the framework used by Stiglitz (1982, 1987). In

<sup>30</sup> There are goods for which this may be a reasonable assumption; examples include housing, and water and electricity consumption. However, it is hard to justify this assumption for all goods that is required here.



this case, Pareto efficient allocations can be implemented through a combination of a nonlinear income tax and nonlinear commodity taxes. Public provision is then unnecessary and taxation—including nonlinear price subsidies—is sufficient for the purpose of redistribution.

Observe that for this result to hold for all possible preference specifications, one requires the availability of nonlinear taxes for all commodities and not just the good subject to transfers. Cremer and Gahvari (1998) consider a model in which the government observes housing consumption at a personal level, but its information on all other consumption goods relates only to their anonymous transactions. They nevertheless show that a nonlinear income tax, supplemented by a nonlinear consumption tax on housing, is sufficient for implementation of all (constrained) Pareto-efficient allocations. The reason they can do this, however, is because they work with a particular preference specification.

Dan Anderberg (2001) also studies a case where only the good subject to transfers is taxed nonlinearly, and derives a condition under which this tax and the nonlinear income tax implement the constrained Pareto-efficient allocation. What makes this possible in his model is that there is only one labor supply decision; namely, that of participation in the labor force by the high-ability persons. He assumes that every high-ability person supplies one unit of time regardless of the wage, and that every low-ability person cannot work and earns nothing.<sup>31</sup>

A. Lans Bovenberg and Bas Jacobs (2005) also consider a case where the good subject to transfers, which in their case is education, is taxed nonlinearly. In their model, edu-

cation is an input that enhances a worker's earning ability. Preferences depend only on one consumption good and leisure. Theirs is a straightforward result from optimal tax theory. Ordinarily, one does not want to tax inputs. The income tax distorts future earnings downwards and the education subsidy is used to offset this. With a linear income tax, the subsidy rate is just equal to the income tax rate. With the nonlinear income tax, the two are equal at the margin.

#### 8. *In-Kind Programs and Labor Supply in Practice*

The preceding section works through a large literature highlighting the theoretical effect of in-kind programs on labor supply and suggesting that programs that provide goods complementary to labor are the best candidates for public provision. In this section, we review the evidence regarding the effects of actual programs on labor supply and conclude that it is unlikely that enhancing short-run labor supply is a major reason that benefits are provided in kind. For one thing, as discussed above, a large share of in-kind benefits are consumed by the elderly, who are not expected to work. Moreover, the existence of an old age safety net may cause people to work less at younger ages, because they will have less need to accumulate savings (see Alan B. Krueger and Bruce D. Meyer 2002 for a review of this literature). The mechanisms through which in-kind programs can affect labor supply depend on one's time horizon. Below, we examine the empirical evidence for health, food and nutrition, housing, and child care in the short and long-run.

<sup>31</sup> Anderberg (2001) also characterizes the optimal tax-cum-public-provision policy when the government provides Ables and Infirms with different levels of the publicly provided good. He further derives a condition under which public provision to Infirms alone, conditioned on income, along with a tax or subsidy on the good if purchased from the market, can implement the two-

level allocation. The condition is one of overprovision with respect to the market price of the publicly provided good. Observe that if the good is over-provided to the Infirm, it must also be over provided to the Able masquerading as Infirm. This follows by assumption. In Anderberg (2001), Able and Infirm have preferences over private and publicly provided goods such that  $MRS^{AI} < MRS^I$ .

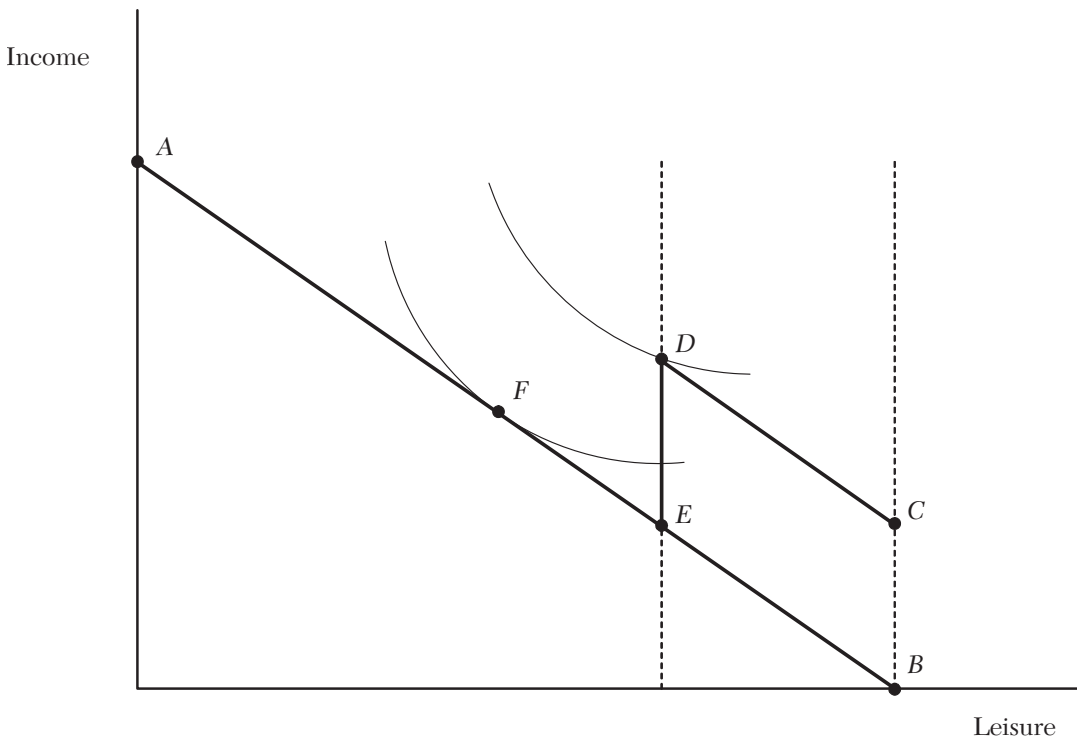


Figure 3. Income Cutoffs and Notches in the Budget Constraint

### 8.1 Short-Term Effects

In the short-run, in-kind programs often have negative effects on labor supply. Compulsory education programs have negative effects because people who are in school are not working. Other programs have negative effects both through the income effect and through the creation of so-called notches in budget constraints. Figure 3 shows a typical notch. In the absence of the program, the budget constraint is  $AB$ . With the program, the constraint is  $AEDC$ . Reducing leisure beyond point  $D$  leads to an abrupt fall off in program benefits, so that there is an extremely high marginal tax rate in the neighborhood of the notch. As a result, people who would have located at point  $F$ , will work less and locate at point  $D$ .

#### 8.1.1 Health

Until 1987, one of the largest notches in the United States was associated with the Medicaid program. Because the income cutoffs for cash welfare were the same as those for public health insurance under the Medicaid program, welfare mothers who raised their incomes above the cutoff would lose both their welfare benefits and health insurance. Yelowitz (1995) examines the effect of reducing the notch associated with Medicaid. As of the early 1980s, welfare mothers who went to work would lose public health insurance for themselves and potentially for their children (often the children remained eligible, but the transactions costs associated with applying for the program increased dramatically when the children were no longer automatically eligible). When this linkage between

welfare and insurance was relaxed so that the children of low-income women remained insured, labor supply increased in this group. However, Meyer and Dan T. Rosenbaum (2001) believe that this is because the expansions of the Medicaid program coincided with increases in the generosity of the Earned Income Tax Credit.

In a regime in which private health insurance benefits are tied to employment, increases in public health insurance can also reduce labor supply by lessening dependence on employment as a means of securing health insurance. There is considerable evidence for example of retirement lock, the idea that some U.S. workers who would otherwise choose to retire are locked into their jobs by the fear of losing health insurance (Brigitte C. Madrian 1994).

### 8.1.2 *Food and Nutrition*

Currie (2003) reviews the evidence regarding the labor supply effects of U.S. food and nutrition programs. One of the difficulties in examining the effects of these programs is that, since they are national programs, there is little variation to empirically identify their effects. Several programs consider the combined effect of cash welfare (under AFDC, the old Aid to Families with Dependent Children cash welfare program) and Food Stamp Program benefits on the behavior of female-headed households. Since most households that received cash welfare also received food stamps and food stamp benefits are reduced thirty cents for every dollar of welfare benefits, the combined data offer some purchase on the problem because variation in cash welfare benefits across states creates some variation in food stamp benefits. Thomas Fraker and Moffitt (1988) use data from 1979 to estimate that food stamps reduced labor supply by 9 percent. However, they also found that small changes in guarantee levels and benefit reduction rates had little impact on hours of work. Michael Keane and Moffitt (1998) estimate a struc-

tural model of participation in multiple welfare programs and again conclude that even the extremely high marginal tax rate in the neighborhood of the notch have relatively little effect on work effort.

Paul A. Hagstrom (1996) examines the effects of food stamp participation on the labor supply of married couples and finds that the labor supply effects are even smaller than those found in studies focusing on single persons. These findings are consistent with the literature on cash welfare programs, which also finds small labor supply effects (c.f., Moffitt 1992, 1998). Hagstrom identifies his model using variation in food stamp benefits stemming from differences in nonlabor income and deductions (such as shelter deductions) across households with identical labor incomes.

More recently, Hilary W. Hoynes and Diane Schanzenbach (2007) use variation stemming from the county-by-county introduction of the Food Stamp Program in the United States to examine its effects on labor supply. Their point estimates suggest that the Food Stamp Program has negative effects on work effort but are not statistically significant.

### 8.1.3 *Housing*

Although housing programs are much larger than nutrition programs in most developed countries, there has been little research examining the effect of providing housing on labor supply. Notches created by public housing programs create large potential work disincentives (see, for example, Christopher Giles, Paul Johnson, and Julian McCrae 1997), but we are not aware of research that shows, for example, that changes in these programs have effects on labor supply. A larger issue may be whether public housing is in fact complementary to labor supply. Here the key issue would be whether public housing is located near jobs or transportation. There is a large literature about spatial mismatch which argues that some demographic groups have high unemployment rates because

they are geographically separated from job opportunities.

Scholars, such as Steven Raphael and Michael A. Stoll (2002), note that jobs have moved away from poor neighborhoods so that spacial mismatch makes it difficult for the poor to find work. On the other hand, David T. Ellwood (1986) points out that black and white teens living in the same neighborhoods have dramatically different unemployment rates, even though they face a similar spacial distribution of jobs. Moreover, one's neighborhood is a choice and, even though residential segregation is a pronounced feature of most American cities, blacks also have a history of migrating from areas of low opportunity to areas of high opportunity. In 1940, three-fourths of all U.S. blacks lived in Southern states, while by 1970, one-half of black men lived in northern cities (James P. Smith and Finis R. Welch 1989).

The Moving to Opportunities experiment, which randomly assigned public housing residents to neighborhoods with low poverty rates, found little effect on employment, public assistance, or earnings after five years (Jeffrey Kling et al. 2004). In summary, there is no direct evidence that spending on public housing affects labor supply (one way or the other) and there is controversy about the extent to which residential location (which might be affected by housing programs) affects labor market outcomes.

### 8.1.4 *Child Care*

Child care may be more likely than other programs to affect contemporaneous labor supply, especially the labor supply of young women. David Blau and Currie (2006) summarize twenty studies that examine the elasticity of maternal employment with respect to child care prices. The estimates are highly variable, but three studies that account for the possibility of unpaid child care yield estimates that suggest that the true elasticity may be small. One of the most convincing studies of this question is by Jonah B. Gelbach (2002) who uses variation in the cutoff age

for eligibility for Kindergarten to identify the effect of free public child care on the labor supply of mothers. Comparing mothers whose youngest children just missed being eligible for Kindergarten with those whose youngest children were just old enough to attend, he finds that a subsidy of this magnitude (i.e., free child care for at least half of the day) increased labor supply by four to five percentage points among both single and married mothers. The effect of the price of child care on the intensive labor supply margin is of interest as well. Most studies of this issue also find quite small effects.

On the whole then, there is little evidence that in-kind programs have positive short-run effects on labor supply that would tend to offset the deadweight losses associated with the tax system. Child-care, the type of transfer that seems most directly complementary to labor supply, does have positive effects on mothers with young children, but they seem to be relatively small.

## 8.2 *Long-Term Effects*

On the other hand, many in-kind programs can be expected to enhance the productivity and labor supply of workers in the future, though with few exceptions (such as Bovenberg and Jacobs 2005) this is not generally a focus of the theoretical literature. Rhetoric that describes social programs serving families and children as investments suggests that a concern with long-run productivity and future labor supply could be an important major justification for in-kind transfer programs.<sup>32</sup> However, this observation does not explain why government provides the investments in-kind rather than by giving cash transfers and allowing families to make the desired investments? This would

<sup>32</sup> There are countless examples of such rhetoric. A particularly interesting example is an editorial in *The Hindu*, December 30, 2006, entitled "Investing in our Children," which called on government to expand child feeding and health services.

solve the problem if families were merely credit constrained, for example. It must be believed that families would not invest appropriately given the cash. Possible reasons are because their preferences differ from those of a social planner (e.g., it may be that they do not take externalities into account or that they have different discount rates), they lack information about the productivity of investments, there is an agency problem (in the case of parents who must invest in a child), or some other market failure. In order for it to be socially efficient to undertake these investments in kind, it must be the case that they have a larger payoff in terms of future hours, wages, and productivity of citizens than the equivalent amounts received in cash.

### 8.2.1 *Education*

In the long run, public primary and secondary education is one of the programs that has been most consistently shown to increase labor supply, so perhaps it is not surprising that it is available in all developed countries and in many developing ones. One might expect job training programs to have similar effects, since they are, after all, specifically aimed at improving employment and earnings. But the large literature evaluating job training programs typically finds only modest gains in either labor supply or earnings. Robert J. Lalonde (1995) argues that this is because we get what we pay for: That is, given what we know about the size of returns to education, most training programs are too short and too superficial for it to be reasonable to expect them to have much impact.

### 8.2.2 *Health*

The literature on health and labor supply is surveyed in Currie and Madrian (1999). Although the estimated effects vary greatly depending on the measure of health and the identification assumptions, the literature does suggest significant effects. Currie and Gruber (1996a, 1996b) show that the extension of public health insurance to uncovered groups of infants and children significantly

improved their health. It is likely that these children will grow into healthier adults, and there is growing evidence that improvements in health have intergenerational effects (this literature is surveyed in Currie forthcoming). For example, Douglas Almond and Kenneth Y. Chay (2006) examine the effect of desegregating hospitals in Mississippi during the 1960s. They find that this improved the health of black mothers born there in the 1960s, but that it also improved the health of the children of the affected mothers. There is also a great deal of evidence that uninsured adults are less likely to get medical care, including necessary preventive services (see, for example, Joseph P. Newhouse et al. 1993 for a summary of results of the RAND health insurance experiment) that would have negative impacts on their future health status.

Of course most of the money spent on public health insurance programs is spent on the elderly. David Card, Carlos Dobkin, and Nicole Maestas (2004) examine the effect of gaining Medicare coverage at age sixty-five on the health care utilization and outcomes of older U.S. adults. They find that gaining insurance coverage is associated with a narrowing of racial and economic disparities in utilization of health care. There are increases in hospitalizations at age sixty-five, but these are mainly for elective procedures (such as hip replacements). Individuals also report that they are in better health after they turn sixty-five, especially in groups who were less likely to have coverage at younger ages, but there is no shift in mortality trends. It would seem that the major reason for providing medical care to the elderly has nothing to do with labor supply or productivity.

### 8.2.3 *Food and Nutrition*

Many nutrition programs were enacted because of concerns that the health or future health of the work force might be in jeopardy due to poor nutrition. In the United States, the World War II draft had revealed large numbers of young men unfit for service



because of nutrition-related deficiencies such as tooth-loss, rickets, and skeletal deformities. These types of problems have been virtually eliminated in rich countries today, although it is hard to know how much of that improvement is due to in-kind transfer programs and how much is due to general improvements in living standards and reductions in the cost of food. Presumably these programs have some impact on individual's capacity to work.

Programs that provide specific foods or nutrients directly to young children appear to have the largest impact on future potential productivity. For example, in the United States, the Supplemental Feeding Program for Women, Infants, and Children has been shown to have large and significant effects on infant health and the School Breakfast Program has been shown to improve children's test scores. In developing countries, the effects may well be larger and visible for adults as well as children. Ernesto Pollitt et al. (1993) report on a randomized trial of a nutritional supplementation program in Guatemala that had large impacts on the test scores and schooling attainment of treated children. The nutritional component of the Progreso program in Mexico is also estimated to have positive effects on child health and growth (Jere R. Behrman and John Hoddinott, 2001; Paul Gertler 2000). In Indonesia, randomized evaluation of a program to provide iron supplementation to adult workers shows a significant increase in earnings among the supplemented group (Duncan Thomas et al. 2004).

#### 8.2.4 Housing

Even housing programs may have some long-term effect on productivity. William Julius Wilson has argued that the increasing concentration of poor black children in neighborhoods with few positive role models has had devastating consequences (1987). However, Currie and Yelowitz (2000a) show that although children who live in housing projects generally have worse outcomes than other children, this appears to be due

to selection rather than to living in a housing project per se. They control for the endogeneity of living in a project by using the fact that families with boys and girls are assigned larger units, and are therefore more likely to choose to live in public housing, than other families of similar size. They find that children who live in projects actually live in less crowded conditions than they would otherwise and are less likely to have been retained in grade.

#### 8.2.5 Child Care

Child care programs that involve early intervention services (such as Head Start) have also been shown to be an effective way to augment the human capital of young children. For example, Currie and Thomas (1995) and Eliana Garces, Thomas, and Currie (2002) show that participation in Head Start raised children's test scores and their probability of completing high school. Such effects are likely to lead to higher future wages and are consistent with evidence from "model" programs such as Perry Preschool or the Carolina Abecedarian program (for reviews of these programs, see Lynn A. Karoly et al. 1998 or Blau and Currie 2006). Flavio Cunha and James J. Heckman (2007) develop a model of childhood human capital development in which intervention at early ages is most effective because there are dynamic complementarities; inputs at each stage help to set the stage for learning that occurs at the next stage.

To summarize, the empirical literature offers some support for the idea that in-kind transfers to children may be productivity enhancing in the long run. Of course, whether programs that increase work capacity and productivity will actually increase the number of hours worked will depend on the income and substitution effects associated with higher wages. If the substitution effect is stronger than the income effect for low wage workers and if programs are targeted to children at risk of becoming low wage workers, then it is likely that these programs will

increase the labor supply of workers at the bottom of the income distribution. Moreover, even if hours fall, taxable income will rise in response to an increase in productivity as long as consumption is a normal good.

### 9. *Do In-Kind Transfers Change Consumption Bundles?*

The extent to which in-kind transfers are over provided may shed light on the reasons underlying these policies. Both paternalism and second-best stories involving complementarities with labor supply imply that in-kind goods will be overprovided. In contrast, theories in which goods are provided in-kind in order to improve targeting do not necessarily imply overprovision.

There is little direct evidence on this point with regard to elementary and secondary education. It seems likely that many households, given the cash equivalent, would in fact choose to spend it on educating their children, but this is more likely to be the case for rich households than for poor ones. Thus, universal primary and secondary education might be regarded as overproviding education for some low income households.

With respect to food and nutrition programs, the answer depends on the program. Analysts have long argued that Food Stamp benefits ought to be treated like cash because families typically receive Food Stamps worth less than their food budgets. There also seems to be a well developed market in Food Stamps. However, Diane Whitmore (2002) provides evidence that at least some households are constrained by the Food Stamp program to spend more than they otherwise would on food but that these households tend to spend the extra benefits on foods that are not nutritious (such as soft drinks). Hoynes and Schanzenbach (2007) find that the marginal propensity to consume food out of food stamps is the same as the marginal propensity to consume out of cash income.

In the case of the Supplemental Nutrition Program for Women, Infants and Children

(WIC) and school meals programs, the cash value of the benefits is small (about \$35 per month in the case of WIC packages without infant formula). It seems highly unlikely that a cash transfer of this size would result in detectable changes in children's nutritional status. For example, Currie and Nancy Cole (1993) show that the much larger cash transfers under the old AFDC cash welfare programs had no effect on infant birth weight. Hence, the fact that these programs have measurable impacts on child nutrition suggests that they do result in an overprovision of healthy foods relative to what a parent would choose given an equivalent cash transfer. This is certainly consistent with paternalism and perhaps with a second-best argument for in-kind provision if we take the view that investments in children are complementary to long-run labor supply.

With regard to public housing, most families receiving this benefit would spend far more on housing in the private market, so it seems unlikely that the good is overprovided. Rather, it appears that a low quality good is made available to needy families in order to enhance targeting.

The case of medical care is complicated, because what is provided is insurance rather than a particular package of goods or services. Medical care may be underprovided to some enrollees (those who do not access preventive care, for example) and overprovided to others (enrollees receiving costly end-of-life care that they may not desire). If we think of the benefit as insurance, then it is almost certainly overprovided since most enrollees would not choose to use an equivalent cash transfer to purchase health insurance, even at a heavily subsidized rate. The growing numbers of people who decline employer-sponsored health insurance to remain uninsured supports this argument (Currie and Yelowitz 2000b—note that most of these people are not eligible for Medicaid).

Finally, programs such as Head Start are likely to overprovide child care in that



families who do not have the option to enroll in Head Start generally opt for lower quality care arrangements than those provided under the program (Blau and Currie 2006).

There have been few attempts to measure the extent of overprovision. Jon Sonstelie (1982) provides one example. He argues that, because it is more costly to provide a unit of education of given quality publicly than privately, there is a large deadweight loss associated with offering public education. His estimates are based in part on a median voter framework in which there are three groups: those who consume public education but would prefer that it be of lower quality, those who are happy with the quality that is offered, and wealthier families who opt into private education because the quality of public education is too low. The results are likely to be sensitive both to this framework and to problems arising from selection of voters into school districts. Moreover, if it is the higher cost of unionized teacher wages that drives the high cost of education, then this transfer of resources from taxpayers to teachers is not entirely a deadweight loss. Daniel T. Slesnick (1996) offers a more recent analysis of other in-kind benefits. Beginning with an indirect utility function, he calculates the monetary value of the welfare gain to recipients of receiving cash rather than several types of benefits. His data is from the U.S. Consumer Expenditure Survey and spans the period 1961 to 1991. He considers several broad categories of expenditures and possible transfers. Consistent with the discussion above, he finds that the deadweight losses associated with in-kind transfers of food stamps and housing programs (what he calls capital services) are small, which implies that most households receiving these benefits are not changing their consumption bundles because the benefits are received in kind. It is likely that other in-kind transfers, such as education and medical care, have larger effects.

## 10. *Other Justifications for In-Kind Transfers*

Other justifications that have been put forward in favor of in-kind transfers are discussed below.

### 10.1 *The Samaritan's Dilemma*

The Samaritan's dilemma, introduced in the literature by James M. Buchanan (1975), arises when transfers may be given at different times. The dilemma is in choosing between a commitment not to bail today's recipients out in the future and letting the recipients' current decisions be distorted in anticipation of future transfers. Neil Bruce and Michael Waldman (1991) argue that such a dilemma arises in the context of human capital accumulation decisions. Suppose the current transfer recipients are entitled to receive benefits as long as they are poor. This undermines their willingness to invest in activities that reduce the likelihood of their being poor in the future. The reason is that they bear the costs of such investments but not the benefits. When the investments pay off and they pull themselves out of poverty, their future entitlements will be eliminated or reduced. This realization distorts the recipients' current decisions and results in an inefficiently low level of human capital investments on their part.

One way out, in lieu of a precommitment to refuse help in the future, would be for the government to offer the individuals job training opportunities in the current period, instead of giving them cash. The conditional cash transfer programs like Progresa, which were discussed above, can also be seen as a response to the Samaritan's dilemma. Note that while the government cares about the welfare of the poor, there is no tension in the Samaritan's dilemma model between the government and the individuals in their valuations of the latter's lifetime choices. The inefficiency to be solved by the provision of in-kind transfers arises because of

the moral hazard problem created by the government's lack of ability to precommit. Given precommitment, the government would have no qualms about the individuals' decisions.

Similarly, Coate (1995) argues that the Samaritan's dilemma provides an efficiency argument in favor of public provision of insurance. The innovative part of Coate's argument is that, even if the government can precommit (not to help the unlucky poor if they do not have insurance), we may still have an inefficient outcome because of private charities. As long as individuals believe that private charities would bail them out in case of a catastrophic accident, they will not buy the efficient level of insurance.

### 10.2 *Redistribution within the Household*

One hypothesis that has received little attention in the literature is the possibility that in-kind transfers are an attempt to redistribute within the family from parents to children by restricting transfers to items that benefit children more than what would have been purchased with the same funds otherwise. Why would the government try to override the parent's preferences? A classical utilitarian answer could be that the children enter separately into the objective function of the social planner and do not simply enter through their effects on the parent's utility functions. Fiscal and other externalities on others (as discussed in section 8.2 above) could be a second reason. Attempts to provide equal opportunity is an additional argument that is often made, which is of course consistent with paternalism.

### 10.3 *Pecuniary Effects*

The idea here is that the government can lower the price of the publicly provided good by pushing its supply up. Cash transfers cannot replicate this. In this way, the government achieves a policy objective beyond the

transfer of resources to the welfare recipients. Lowering the supply price will hurt the producers of that particular good while benefiting *all* its consumers (and not just the transfer recipients). As an example, Coate (1989) argues that shipping food directly to the victims of famine is preferable to giving them cash because food prices will be lower when food is shipped directly.<sup>33</sup>

Similarly, Coate, Stephen Johnson, and Zeckhauser (1994) give the example of a developing country wanting to redistribute from rural farmers to urban dwellers. One way of doing this is to lower domestic food prices. Importing food from abroad and distributing it to urban dwellers, while taxing them to finance the program, achieves this. Observe, however, that one is implicitly assuming here that the government cannot directly tax rural farmers to effect the same redistribution—a supposition that may be justified on the basis of administrative costs or political considerations. The unavailability of certain tax instruments is thus behind this type of justification for in-kind transfers.

Seen in terms of instrument feasibility, the above rationalization is the same as in previous cases where informational asymmetries prevented the government from levying particular tax instruments. Consider, for example, the Atkinson and Stiglitz (1976) theorem, but now assume that some consumers have endowments of certain goods. If the government could tax these endowments away, then a nonlinear income tax will be the optimal policy (assuming labor supply and goods are weakly separable in preferences). In particular, there will be no need for public provision. However, to the extent that government can tax only market transactions, it will not be able to tax endowments away. Under this circumstance, increasing the supply of the endowed goods, through a public provision

<sup>33</sup> See also Dan Usher (1977) who argues that one can appropriate rents from suppliers of a "socialized" commodity if the socialization program decreases its average consumption.

program, may partially achieve the same goal by lowering the price of these goods.

A few studies indicate that pecuniary effects may be quite important, at least in some markets. Murray (1983) found that for every one hundred units of subsidized housing built, only seventy-five new units actually came to market. The other twenty-five units were crowded out by the public program. More recently, Murray (1999) distinguishes between conventional public housing projects and subsidized moderate income housing construction. This study concludes that conventional public housing has added to the stock of affordable housing in the United States (perhaps because private developers are not interested in this segment of the market) but that subsidized moderate income housing has had less impact on the total supply of affordable housing. Pecuniary effects may have also underlain the decision of European governments to build social housing in the 1950s and 1960s. Following the destruction of the war, housing was scarce in many areas and increasing supply was seen as a way of bringing down the price (Hugo Priemus 2001).

However, the pecuniary effects of government programs may also be perverse. Amy Finkelstein (2007) provides evidence that the introduction of the U.S. Medicare program (public health insurance for the elderly) has driven up medical costs by making the elderly, who are the largest consumers of medical care, insensitive to price. The creation of a class of consumers who are insensitive to price may have also skewed medical research towards the development of high-cost therapies.

#### 10.4 *Credit Constraints*

It is sometimes argued that imperfections in financial markets provide another justification for in-kind transfers, particularly in developing countries and especially in rural areas where access to financial markets may be severely limited. High risk associated with low level of economic activity, complicated legal structure, lack of regulatory

supervision, and the like further exacerbate this problem. The result is that the poor are often unable to secure loans for projects that are profitable and socially useful. In response, the World Bank and other similar institutions have in recent years attempted to encourage the establishment and development of financial cooperatives and their networks in these countries (see Ajai Nair and Renate Kloeppinger-Todd 2007). However, the problem is more acute for securing long-term sources of funds. The lack of long-term funds has forced individuals and firms to rely on short-term borrowing, thus exposing them to liquidity risks and impeding their growth (see Allen N. Berger, Richard J. Rosen, and Gregory F. Udell 2001, Patrick Honohan and Luc Laeven 2005, Margaret J. Miller 2003, Berger et al. 2005, Martin Brown, Tullio Jappelli, and Marco Pagano 2007, Hernán Ortiz-Molina and María Fabiana Penas 2006, and Marco Sorge and Chendi Zhang 2007).

It is possible that credit constraints prevent poor parents from investing in their children's education and health. One problem is that parents cannot borrow to invest in their children using the children's future earnings as collateral. Without such investments, it is argued, poverty forms a vicious circle condemning a family's offspring as well. See, among others, Roland Benabou (1996), Karla Hoff and Andrew B. Lyon (1995), Raquel Fernandez and Richard Rogerson (1998), Susan E. Mayer (1997), Mulligan (1997), and John Shea (2000).

Credit constraints evidently provide a rationale for providing transfers, but do they provide a reason for making transfers in-kind rather than in cash? One way to solve a problem of credit constraints would be to give the family a lump sum transfer. The reason for preferring in-kind transfers (e.g., public provision of education or a conditional cash transfers tied to keeping children in school), must be that policymakers suspect that some families would not spend a lump sum transfer on education. This might be because

there is an agency problem between parents and children, such that parents do not value the return on the investment in children's human capital as highly as children would if they were the decisionmakers or because families lack information about the returns to education. Alternatively, it might simply be the case that the credit constrained household has another, higher valued, project that it would finance if it were given a lump sum transfer. For example, in a very poor household, buying food might be a higher valued project than sending children to school. This argument suggests that credit constraints by themselves are not a sufficient rationale for in-kind programs. It is also necessary to assume that there are agency problems or that the social planner ranks projects differently than the target households.

### 10.5 *Asymmetric Information amongst Agents*

It is well-known that asymmetric information can cause markets to fail and that, in some cases, government intervention may improve the overall efficiency of the economy.<sup>34</sup> The market failures associated with asymmetric information typically occur in markets that deal with risk, so that government intervention takes the form of social insurance programs. Other important considerations here are the relative administrative costs of running these programs under private and public provision, and the ability of the private and public sectors to circumvent the fundamental moral hazard problem that arises when people are insured against an adverse occurrence; namely, discouraging the insured from taking preventive measures. The potential efficiency enhancing of social insurance programs notwithstanding, they are not direct mechanisms for improving the

efficiency of transfers between the rich and the poor which is the subject of our survey. In fact, Martin Feldstein (2005) argues that social insurance programs, as practiced in the United States, have been far from equity enhancing. The academic literature on this topic is vast, covering issues that are varied and complex enough to warrant surveys of their own. Accordingly, we limit ourselves to making a few basic observations on the types of social insurance programs, their aims, and their justifications.

In most western European countries and the United States, expenditures on social insurance programs are simply huge, dwarfing expenditures on other welfare programs.<sup>35</sup> The basic aim of these programs is to provide individuals with some degree of insurance against the risks associated with inadequate assets during retirement (social security), health care expenses (public health insurance), permanent job loss (disability and survivor insurance), and temporary job loss (unemployment insurance).

Consider the social security system. There are a number of reasons why individuals save inadequately for the future, including myopia and unanticipated expenses. These reasons apply to the rich and the poor alike, although the implications of inadequate savings are more devastating for the poor. Additionally, the poor may save little because they have a high discount rate for future consumption. In any case, while mandatory social security may be more efficient than a private system, it is hard to argue that it is a more efficient way of helping the poor. To justify the latter claim, one must invoke other reasons like paternalism or the Samaritan's dilemma (or a market failures such as the adverse selection which causes a breakdown in private annuity markets). Moreover, the arguments for and

<sup>34</sup> The issue here is one of asymmetric information amongst agents. As we have discussed earlier, asymmetric information between the government and agents is behind self-targeting and efficiency-enhancing-of-the-tax-system justifications for in-kind transfers.

<sup>35</sup> Feldstein (2005) reports that, over four decades ending in 2003, the costs of social insurance programs in the United States have risen from 2.7 percent of GDP to 7.4 percent of GDP, while the spending on means tested programs (except Medicaid) has gone up from 1.0 percent of GDP to 1.3 percent of GDP.

against mandatory social security are more complex because of the moral hazard the system creates, resulting in depressed private savings and distorted labor supply decisions (see Feldstein 2005 and Krueger and Meyer 2002).

Besley and Miguel Gouveia (1994) present a thorough discussion of private and public provision of health care. If individuals' risk characteristics are unobservable and unevenly distributed across the population, insurance companies cannot condition their premiums on these characteristics; instead they will have to set their premiums to cover average risk levels. This leads to an adverse selection problem that can cause a death spiral in the existing insurance market in which the good risks select out of insurance, the price rises, and more people select out until the system collapses. Moreover, if risks become observable over time and if insurance companies are unable to commit to the same rates regardless of the customer's future conditions, those who are found to be high risk will be dropped. This latter problem may very well be more acute for the poor, but to argue that the very high risk persons should stay in the insured pool requires some kind of justification based on paternalism or specific egalitarianism. Observe also that lifetime insurance purchases, and who pays for insurance, depend on whether or not insurance terms change, as new information is revealed over time, to reflect the true costs of insuring high- and low-risk individuals.<sup>36</sup>

Unemployment and disability insurance raise similar issues. The justification for public provision rests mainly on the absence of private provision due to adverse selection and the argument that public provision may

entail lower administrative costs. These efficiency considerations apply to the rich and the poor alike; yet one can think of a number of reasons that lack of insurance afflicts the poor more acutely here. One way of insuring oneself against disability and particularly unemployment is to resort to self insurance. This may take the form of one's drawing on one's savings, borrowing from family and friends, or borrowing from financial markets. All of these are plainly less available to the poor. Under these circumstances, unemployment and disability insurance programs can be considered as more valuable to the poor.<sup>37</sup>

Finally, we should point out that public provision of social insurance is intricately related to its implementation through the tax system. This leads naturally to a three way trade-off between equity, efficiency, and social insurance. Rochet (1991) shows that social insurance is desirable if risk and earnings ability are negatively correlated; Cremer and Pierre Pestieau (1996), Boadway et al. (2006), and Nick Netzer and Florian Scheuer (2007) further explore and generalize this result.

## 11. *Political Economy Considerations*

Redistributive policies, in cash or in kind, cannot be imposed on the population in a dictatorial fashion. If a policy lacks political support, the party which advocates it will not be elected or returned to office. In-kind transfer policies must thus satisfy some type

<sup>36</sup> Other reasons for government intervention in health markets include health externalities and the fact that the market for medical care is monopolistically competitive (see Peter A. Diamond 1992). There are also moral hazard problems that cause excessive consumption of medical care. Observe also that the higher costs associated with excessive consumption may call for direct government intervention (see Besley and Gouveia 1994).

<sup>37</sup> Martin Neil Bailly (1978) is the classic study of optimal provision of unemployment insurance. See also, among others, Raj Chetty (2006) who extends Bailly's results to more general settings. Diamond and Mirrlees (1978) is an early paper that characterizes optimal disability schemes. See also Mikhail Golosov and Aleh Tsyvinski (2006) who build on Diamond and Mirrlees's (1978) framework and extend his results to dynamic settings. This latter paper is an example of a recent literature that appears under the rubric of dynamic optimal taxation and extends the Mirrlees's approach to optimal taxation to dynamic settings. A sample of other papers in this literature includes Marco Battaglini and Coate (2008), Narayana R. Kocherlakota (2005, 2006), and Golosov, Tsyvinski, and Ivan Werning (2007).



of political feasibility constraint. As one example, Alain de Janvry, Andre Fargeix, and Elisabeth Sadoulet (1991) examine the political feasibility of specific food subsidy policies in India and Ecuador. They construct an index of the political feasibility of policy outcomes based on studies of the determinants of influence by groups in civil society and on the role of the state in policy making.<sup>38</sup> Since the literature is concerned with ensuring that the political feasibility constraint is met, the policy is usually required to be the equilibrium outcome of a voting procedure or of a political game between political parties and the electorate. The literature has also applied the political feasibility test to specific features of transfer schemes such as targeting.

An important shortcoming of most theoretical studies of the political economy of redistribution is their reliance on an extremely limited set of policy tools. Since the policy in question must be an equilibrium outcome of a political process, it is not be easy to characterize the type of political equilibria that might emerge or to ascertain that there will in fact be an equilibrium. This limitation often raises the question of how applicable the results are to more general settings that allow for more realistic policy instruments. From our point of view, another limitation of the literature is that even studies that deal with the level of in-kind transfers often do not explicitly address the issue of why transfers are given in-kind rather than in cash.

### 11.1 *In-Kind Transfers as a Voting Equilibrium*

Fernandez and Rogerson (1995) present a model in which individuals vote over the

extent to which public education is subsidized. They show that in equilibrium higher education will be only partially subsidized so that those who are credit constrained will not be able to participate. Thus the middle and upper classes combine to exclude the lower class from receiving the benefits of publicly funded higher education. Whether credit constraints are actually an important barrier to higher education is, as we discussed above, a hotly debated topic (see also Pedro Carneiro and Heckman 2002 and references therein).

Dennis Epple and Richard E. Romano (1996a, 1996b) and Gouveia (1997) study the determination of the level of expenditures on a publicly provided good, which is financed by a proportional tax levied on a numeraire good through a majority vote. In Epple and Romano (1996a), recipients cannot top up the good subject to transfers but can opt out of the system (as in schools). The authors distinguish between two cases based on whether the slope of the indifference curve between public expenditures and tax rate is (i) declining in income, and (ii) increasing in income. They show that under (i), a majority-voting equilibrium exists and the median-income voter is decisive. Under (ii), on the other hand, equilibrium may or may not exist. If it does, it would be of the ends against the middle type with the rich choosing private consumption.

In Epple and Romano (1996b) and Gouveia (1997), topping up of the good subject to transfers is possible (as in health care). They show that in this case and, given certain regularity conditions, a majority-voting equilibrium exists. Epple and Romano's (1996b) also show that a regime with topping up is majority preferred to one with no topping up provision, as well as to one with no tax and no public provision. Additionally, the most-preferred regime entails a higher level of expenditure on the publicly provided good as compared to the other regimes. However, the inefficiency of this tax regime is due to the limitation on the tax instruments used. Observe also that the existence of a majority-voting equilibrium itself, here and in Epple and Romano (1996a),

<sup>38</sup> They find that programs that benefit both the urban poor and the rural rich (such as food subsidies for the urban poor combined with production subsidies for farmers) are the most likely to be implemented, which may explain why there is an urban bias in food programs in countries such as Bangladesh, India, and Pakistan. These policies tend to hurt the rural poor who are actually most at risk of malnutrition.



rests on the assumption that there is only one tax rate in the economy. We know from the usual existence problem with voting over multiple instruments that these results will not survive the inclusion of even one other simple instrument such as uniform cash transfers, which limits their generality.

Blomquist and Christiansen (1999) take a different approach and develop a political economy model that contains the same tax instruments as in the normative models, consisting of a general income tax and linear commodity taxes. Their procedure yields a politically feasible and yet efficient solution. However, they pay a high price for the result in terms of other simplifying assumptions. They assume that taxpayers have voting preferences that match a social preference specification. Specifically, they specify preferences as a weighted sum of the utility functions of different consumer types in the economy, differing from one voter to another only on the basis of the weights each assigns to different consumer types. Furthermore, the authors restrict the number of consumer types to two. This implies that their problem takes the form of voting over a one dimensional issue with single-peaked preferences so that a Condorcet winner exists.

Peter M. Barse, Gerhard Glomm, and Eckhard Janeba (2000) do attempt to show why poorer countries spend a larger fraction of their expenditures on in-kind rather than on cash transfers. Their argument is that in-kind transfers are of very poor quality in poorer countries because they do not have a good tax collection technology. As a result, in poor countries, the rich will not participate in in-kind transfer schemes. This makes these programs more redistributive and encourages the median voter to allocate a larger fraction of the government expenditures to in-kind transfers.

### 11.2 *Targeting as a Voting Equilibrium Outcome*

The question of interest here is whether or not targeting undermines the political sup-

port for in-kind transfers. Gelbach and Lant Pritchett (2002) consider a model in which the policymaker chooses the degree of targeting and then taxpayers vote on the tax rate (the proceeds of which goes to finance the transfers). In their model, there are three types of workers and three types of jobs; targeting is based on the workers' occupational choice; taxation does not distort the workers' labor supply decisions; and as tax rates become too high workers simply switch to the untaxed sector. They show that, in this setting, the equilibrium tax rate decreases with the degree of targeting. More strikingly, they show that, as targeting increases, total equilibrium transfers decrease and that both the poor and the middle class agents become worse off.

Philippe De Donder and Jean Hindriks (1998) also show that targeting erodes political support for redistributive programs. They consider a more conventional model of labor supply with many types of workers, where targeting is modeled by a reduction in benefits as income increases. Their result is that, up to a critical level, the increased degree of targeting does not hurt the poor as the median voter opts for a higher tax rate. When the critical level is reached, redistribution loses its political support altogether and the median voter chooses a zero tax rate.<sup>39</sup> In their example, the critical level is reached at a point where nearly three quarters of the

<sup>39</sup> If the degree of targeting is very low, all taxpayers are effectively on the same linear income tax schedule with a marginal tax rate equal to the sum of tax rate and the targeting rate. Initially, as the targeting rate increases from this very low level, the median voter opts for a lower tax rate to keep the sum of the two at his most-preferred level. However, as targeting increases further, the higher income people's benefits are exhausted and the median voter's preferred tax rate starts to increase. The reason is that a higher tax rate is, as in Barse et al.'s model, beneficial to the median voter because it enables him to extract more tax revenues from those who no longer receive any benefits. There is an upper limit to this process however. The increased tax rate also implies higher distortions which, at some point, offsets the redistributive gains from higher taxes. At this critical point, the median voter suddenly decides to switch to the laissez faire situation of zero income taxation.

population continue to receive benefits. This implies that the degree of targeting is not that high before the redistributive program loses its political support. Kalanidhi Subbarao et al. (1997) describe examples of this type from Sri Lanka and Columbia, where narrowly targeted programs were opposed by the middle class and thus vulnerable when there were changes in the government.

De Donder and Hindriks (1998) also discuss simultaneous voting over tax and targeting rates. In this, they rely on a particular bipartisan electoral competition game between two parties and the voters, using the uncovered set and the minimax set as the solution concepts. They show that this procedure is favorable to the poor in that they can, by successive formation of a majority coalition with the rich to increase targeting and with the poor to increase taxation, converge to their most-preferred policy.

The actual relationship between targeting and political support for transfers is likely to be more complex. In the United States, cash transfers to welfare mothers were initially subject to a good deal of oversight and discretion by social workers. This reassured taxpayers that only the deserving poor were receiving transfers. However, social changes in the 1960s (such as the Civil Rights movement) led to the elimination of discretion on the part of social workers and the substitution of a system in which anyone who met a set of rules was entitled to benefits. The caseload increased and support, in the form of real benefit levels, decreased until the mid-1990s when the whole system was eliminated and replaced with one that emphasizes that welfare mothers are expected to work and may only receive benefits temporarily. The problem seemed to be a loss of confidence in the ability of the system to target deserving recipients.

Alberto Alesina, Edward Glaeser, and Bruce Sacerdote (2001) argue that racism is an important reason for lack of political support for redistribution in the United States since transfers go disproportionately

to black families. They argue that while many European countries also have sizeable minority populations, U.S. blacks are more disadvantaged relative to the average citizen than most European minority groups. They also argue that political institutions in the United States (such as the primacy of the courts), as well as features such as a relatively dispersed population, have diluted the political power of the poor in the United States relative to Europe. They conclude that these political features are a more important explanation for differences in redistributive policy between the United States and Europe than any differences in economic structures such as the tax system.

The policy literature often discusses politics as a reason that transfers are supplied in-kind. For example, in the debate over welfare reform in the United States, there were proposals to cash out the Food Stamp Program. However, these proposals were resisted by an unlikely coalition of agricultural interests (who have always supported the program) and advocates for the poor, and the program escaped the radical restructuring that befell the cash transfer program (see Currie 2006a for a discussion of events surrounding welfare reform, including the discussion of “cash out” of the Food Stamp Program). By focusing on particular goods, in-kind programs create political constituencies in addition to those who are the recipients of the transfers. Political arguments are also used to justify the appeal of universal in-kind transfer programs.

## 12. *Conclusions*

Theory and empirical work often evolve along separate paths. In this essay, we have tried to bring the theory and empirical work regarding in-kind transfers together. Although the two strands of the literature are not closely connected, it is still possible to draw some broad conclusions about the likely reasons why transfers are provided in-kind.

First, paternalism and externalities remain a strong candidate explanation. Second, although there is a large literature on self-targeting, this does not seem to be a major justification for the bulk of spending on in-kind programs. Most in-kind programs are not self-targeted and, in fact, considerable expense is incurred targeting these programs. Some of the more onerous rules regarding program participation can be interpreted as attempts to increase the extent to which the programs are self-targeted. However, these rules often have the perverse effect of screening out the most disadvantaged among the people the transfers are intended to help; hence they may actually reduce the effectiveness of targeting rather than increasing it. The empirical literature about take up suggests that people are very sensitive to the costs of participation, so that small changes in the rules may have large effects on participation.

Another large literature explains in-kind transfers as a way to reduce the labor-supply distortions of the tax system. However, this argument is contradicted by the observation that the bulk of such transfers are made to individuals who do not supply labor. Moreover, the design of many in-kind programs creates large notches that cause considerable labor supply disincentives. Still, the labor supply explanation may apply to some specific programs such as child care (though empirical estimates suggest that the labor supply effects of existing programs are generally small). It is also likely that many in-kind programs for families with children, such as those that supply primary and secondary education, nutritional supplements, medical care, and child care, increase productivity and labor supply in the long run. This investment role for in-kind transfers may provide a more important reason to supply transfers in-kind, although it has not been a focus of the theoretical literature.

Many other explanations for in-kind transfers have been proposed. The Samaritan's dilemma is an attractive possibility that is not obviously controverted by the evidence.

Pecuniary effects may be important justifications for some types of programs, especially those increasing the supply of housing. We have argued that credit constraints alone do not provide a very satisfactory explanation for in-kind transfers, although they do provide a rationale for redistribution more generally. A very large literature discusses asymmetric information and the related topic of social insurance. We have not tried to summarize this literature here, but only pointed to some useful surveys of it.

Politics are often proposed as a reason why transfers are offered in-kind. This seems like a promising potential explanation, although the existing theoretical work tends to posit a very limited set of policy instruments, to ignore the distinction between cash and in-kind transfers, or to take the existence of an in-kind transfer as given and examine the size of the transfer. It would be interesting to see, for example, more work examining the relationship between the share of transfers provided in kind and the political fortunes of various constituencies.

Other avenues for future research include an integration of tagging into the study of in-kind transfers. Our understanding of tagging has not advanced beyond George A. Akerlof's (1978) classic paper. He showed, through an example, that using exogenous characteristics that are imperfectly correlated with skills will be useful for the design of redistributive policies. However, the literature contains no general results on this. For example, suppose the proportions of high-skilled and low-skilled workers differ in two regions. Although one would want to redistribute from the rich region to the poor region, it is not clear how this should be done or even which region should have a more progressive tax system. The *prima facie* case for tagging becomes even less compelling when the targeting indicators are not truly immutable, as they then lead to moral hazard issues—programs designed to help families with dependent children may encourage families to have more children than they otherwise would and programs to

help female-headed households may encourage families to split up. There may be less of a moral hazard problem in programs for assistance to the handicapped but, in many cases, it may be very costly to establish one's handicap. Moreover, even when characteristics, such as race, are immutable, the empirical evidence suggests that tying benefits to these characteristics can result in a loss of political support for transfer programs. There are also moral and philosophical issues here pertaining to horizontal equity.

Programs with or without the possibility of topping up have different welfare properties. Currently, there are no general results regarding the relative merits of the two. The political economy considerations that make a society opt for one or the other program also need further research. Nor are there any general results on the characterization of optimal public provision policies, targeted or universal. One other consideration is the issue of heterogeneity in multiple dimensions (e.g., in tastes rather than only in earnings power) and its impact on the design of tax transfer policies. Some recent papers, as we have pointed out, have studied this issue in the context of optimal tax theory. Its implications for in-kind transfers have been unexplored thus far.

In sum, since in-kind programs are common, it behooves economists to try to understand why transfers are made in kind and when such transfers can improve the equity and efficiency of the transfer system. It is likely that, in this far from perfect world, there is a legitimate role for in-kind transfers. A better understanding of the underlying rationale for in-kind transfers, and of the way that they work in practice, will be necessary if we are to properly harness this tool for increasing societal well being.

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