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More for the Poor Is Less for the Poor

The Politics of Targeting

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Will means-tested targeting help the poor? Economics might say yes, but politics say no.

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Summary findings

Standard economic analyses suggests that when the budget for redistribution is fixed, transfers should be targeted to (that is, means-tested for) those most in need. But both economists and political scientists have long recognized the possibility that targeting could undermine political support for redistribution and hence reduce the available budget.

Gelbach and Pritchett formalize this recognition, developing a simple economy in which both nontargeted (universally received) and targeted transfers are available. The policymaker chooses the share of the budget to be spent on each type of transfer while the budget is

determined through majority voting.

Their results are striking.

If the policymaker ignores political feasibility and assumes that the budget is fixed, she will choose full targeting of transfers — in the process *minimizing* social welfare and the utility of the poor.

By contrast, when the policymaker recognizes budgetary endogeneity, she will choose zero targeting, spending the entire budget on the universally received transfer. Social welfare, the budget for redistribution, and the utility of poor agents are all maximized in the resulting equilibrium.

This paper — a product of the Development Research Group— is part of a larger effort in the group to investigate effective policies for poverty reduction. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Sheila Fallon, room N8-030, telephone 202-473-8009, fax 202-522-1153, Internet address sfallon@worldbank.org. July 1997. (26 pages)

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More for the Poor Is Less for the Poor

The Politics of Targeting¹

Jonah B. Gelbach and Lant H. Pritchett

Abstract. Standard economic analysis suggests that when the budget for redistribution is fixed, income transfers should be targeted to (i.e. means-tested for) those most in need. However, both political scientists and economists long have recognized the possibility that targeting might undermine political support for redistribution. We formalize this recognition, developing a simple economy in which both non-targeted (universally received) and targeted transfers are available for use by the policymaker. We allow the budget to be determined through majority voting, while the policymaker chooses the share of the budget to be spent on each type of transfer. Our results are striking. If the policymaker ignores political feasibility and assumes that the budget is fixed, she will choose full targeting of transfers – in the process *minimizing* social welfare and the utility of the poor, given that political feasibility must hold in equilibrium. By contrast, when the policymaker recognizes budgetary endogeneity, she will choose zero targeting, spending the entire budget on the universally received transfer. Social welfare, the budget for redistribution, and the utility of poor agents all are maximized in the resulting equilibrium.

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1 Introduction

During the 1995-96 debate over the federal budget, the question of whether to means test Medicare benefits was raised. Representative Charles Rangel, a liberal Democrat who represents Harlem, argued against doing so, apparently defending the view that the rich should continue to receive exactly the same benefits as the poor. Speaker of the House Newt Gingrich, a conservative Republican, argued for targeting benefits, so that the rich would receive less generous benefits than the poor. At first glance, such a situation seems a curious political inversion: one politician who regards himself as the defender of his poor constituents arguing in favor of spending on rich ones, with another politician not usually identified that way arguing against such spending.

Moreover, such political behavior seems to contradict both common sense and a fair bit of economics. Common sense suggests that fewer people sharing the pie means larger slices: means-testing, or targeting, means more for the poor. Theoretical assessments of targeting generally have involved normative models in which one assumes the budget for redistribution is fixed, while the structure and degree of targeting is chosen to maximize social welfare (or minimize poverty); alternatively, both the budget (i.e. degree of taxation) and targeting variables are chosen simultaneously. While the literature has considered informational constraints, incentive compatibility, and efficiency losses, some degree of targeting is always found to be optimal in the models examined.¹

¹For examples in a variety of settings, see Akerlof (1978), Atkinson (1995), Besley and Kanbur (1990), Diamond and Sheshinski (1995), Kremer (1997), Nichols and Zeckhauser (1982), Sen (1995), Stern (1982), and Viard (1996).

But what does an experienced politician like Rangel know, that the models do not capture? Why is it often said among policy makers that “programs for the poor are (budget) poor programs”? As political scientists, politicians and policymakers – and certainly some economists – suspect, the size of the pie is not fixed. If the budget for redistribution is politically determined, the impact of targeting cannot be determined without accounting for the effect of changes in the degree of targeting on the size of the budget available for redistribution. Surprisingly, the literature contains no formal treatment of such feedback effects. As the title of this paper suggests, we show that once such effects are incorporated, more for the poor might mean less for the poor.

We construct a simple model in which a policymaker allocates the budget for redistributive transfers between a targeted and a universal transfer to maximize social welfare, while the electorate – composed of three income groups – votes on the level of taxation. The essential feature of the economy we consider is that middle class voters support positive taxation either because they face a positive probability of being unemployed or because they care about the utility of the poor, or both.

If the policy maker is “naive”, so that she assumes the budget is fixed and invariant to the degree of targeting, she will devote as much as possible of the budget to spending on the targeted transfer.² This result is exactly what the standard economic approach to targeting suggests. But when a political feasibility constraint must be respected, this

²Because of informational and incentive constraints, there will be some taxes high enough so that the policymaker will not spend the entire budget on the targeted transfer. If she did, some agents would reduce their labor supply, causing the tax base to fall, so that reducing the degree of targeting would increase all agents’ utilities. We discuss this point in more detail below.

approach not only is not optimal, but in fact it is *exactly* the wrong thing to do, leading to the *minimization* of social welfare. By contrast, a “sophisticated” policymaker who recognizes the political feasibility constraint will maximize social welfare, in the process choosing to allocate *zero* spending to the targeted transfer.

The rest of the paper proceeds as follows. In Section 2, we introduce the basic structure of the model. In Section 3, we present our main results. We conclude in Section 4.

2 The Model

2.1 The basic model

We consider a population having unit measure and consisting of three types of agents: low income, middle income and rich (subscripted by l , m , and r , respectively); group i 's population share is σ_i . If employed, these agents have maximum marginal products equal to μ , 1, and r , respectively, where $\mu < 1 < r$. There are three types of jobs, each of which pays either μ , 1, or r . An agent may work in any job paying no more than her maximum marginal product, and we assume that there are always just enough jobs of each type to employ all workers in their chosen type. We assume that poor and middle income agents have some probability p of being “unemployed” (having zero pre-transfer income) and probability $q \equiv 1 - p$ of being employed. Rich agents are always employed.

Workers in jobs paying μ pay no taxes; by contrast, jobs paying 1 and r are taxable at the proportional rate τ . We motivate this assumption by imagining that there are tax-free “informal” and taxable “formal” sectors in the economy. This assumption follows Kramer and Snyder (1988), who use it in their analysis of the politics of constant versus

increasing marginal tax rates. By replacing variable labor disutility with this assumption, one greatly simplifies the analysis, allowing for closed-form results. Introducing constant labor disutility, as in Akerlof (1978), for example, would cause only minor differences while changing none of the results as stated in the main text.

All agents have the identical von Neumann-Morgenstern utility function u , with $u' > 0 > u''$. Given that informal sector income is untaxed, middle income and rich agents will work in formal sector jobs only if doing so yields greater utility, after including the effects of differences in transfers available to workers as a function of job choice, than choosing to work in the informal sector. We will assume throughout the paper's main text that this requirement is met strictly for both middle income and rich workers.

A 1 (Formal Sector Work) *The utility function u and all parameters of the model are such that in any equilibrium, employed middle income and rich workers always strictly prefer formal sector work to informal sector work, after accounting for all cross-sector differences in taxation and transfers.*

Dropping this assumption complicates the analysis greatly, but does not systematically change our substantive findings. In a companion paper, Gelbach (1997) generalizes the model to account for endogeneity of job choice.³

We define the tax base as \bar{y} . Under assumption A 1 (and because there is no variable labor disutility) the tax base does not depend on the tax rate. Since there are $q\sigma_m$ middle income workers earning 1 unit of income each and σ_r rich workers earning r , the tax base is

³Because there are few changes in our results, and because the generalization requires significantly more notation and rigor to carry out, we have chosen in this paper to focus only on cases when A 1 is satisfied.

$\bar{y} = q\sigma_m + \sigma_r r$. By definition, the total budget available to the government for redistribution is $\bar{y}\tau$.

Two types of transfers are feasible. The first, N , is non-targeted and thus is received universally by all agents. We make the informational assumption that the policymaker is unable to distinguish agents working in jobs with marginal product of μ from agents who are unemployed,⁴ so that the targeted transfer θ , is received only by those agents with zero formal-sector income. Since rich agents are never unemployed, and since assumption A 1 guarantees that rich agents always work in the formal sector, they never receive the targeted transfer. All poor agents receive the targeted transfer, while middle income agents receive it only if they are unemployed. That the targeted transfer θ provides insurance is obvious; perhaps this fact is not so obvious for the universal transfer N . Because N is received when agents are unemployed, it also provides insurance.

We may define the takeup rate for the targeted transfer θ as

$$\bar{\delta} \equiv \sigma_l + p\sigma_m, \tag{1}$$

and we may now write the government's budget constraint as

$$N + \bar{\delta}\theta = \bar{y}\tau \tag{2}$$

That is, total expenditures (the LHS of the budget constraint) are equal to the sum of total untargeted expenditures, N , and total targeted transfers, which in turn are equal to the product of the takeup rate $\bar{\delta}$ and the targeted transfer θ . Total revenues (the RHS of

⁴Again, this assumption follows the spirit of Kramer and Snyder (1988).

the budget constraint) have been seen above to be the product of the (constant) tax base \bar{y} and the tax rate, τ .

Our principal task in the model is to investigate properties of Nash equilibria in a game played between a policymaker and the electorate, where the strategy spaces are the level of the budget (for the electorate) and the budget's distribution between universal and targeted transfers (for the policymaker). We define the fraction of the budget spent on targeted transfers as k , so that we may rewrite the budget constraint (2) as the two identities:

$$\theta = \frac{k\bar{y}\tau}{\bar{\delta}} \quad (3)$$

$$N = (1 - k)\bar{y}\tau \quad (4)$$

Table 1 displays the model's basic components.

As an aside, it will be useful below to have notation for the tax level at which employed middle income workers are just indifferent between formal and informal sector work, given that all employed middle income and rich agents choose the formal sector. That is, fixing k we want to find the tax level such that $N + \theta + \mu = N + 1 - \tau$. This level may be written

$$\tau_m^a(k) \equiv \frac{\bar{\delta}(1 - \mu)}{k\bar{y} + \bar{\delta}} \quad (5)$$

Thus, assumption A 1 requires that in any equilibrium, (k, τ) must satisfy $\tau < \tau_m^a(k)$.

Since some agents will not receive the targeted transfer, i.e. $\bar{\delta} < 1$, the argument that

targeting can increase welfare seems well-grounded: a given amount of revenue spent on targeted transfers allows a greater transfer *per recipient* than the same amount spent on untargeted transfers. Put another way, $\theta|_{k=1} > N|_{k=0}$. Thus the favorable budgetary performance of the targeted transfer stems from the fact that it need not be given to all agents, as the universal transfer must. Favorable *social welfare* performance of targeting hinges on whether those agents excluded from receiving targeted transfers have less “need” for them than those who are included. Using the integral of agents’ utilities as the social welfare function, we show below that *full* targeting – i.e. spending as much as possible on the targeted transfer and as little as possible on the universal one (without violating the incentive compatibility of formal-sector work for middle class and rich agents) – passes this test when the budget does not vary (i.e. when we ignore politics).⁵ Targeting makes use of information about agents’ before-tax and -transfer incomes, so failing to use targeting generally entails ignoring valuable information.

We can now write own-utility functions (i.e. utility functions excluding any altruism) generated by equilibrium job choice behavior. Recognizing that both N and θ vary with the degree of targeting k and the tax rate τ , the own-utility functions of middle income and poor agents are

$$U_i(k, \tau) \equiv pu(N + \theta) + qu(N + \theta + \mu) \tag{6}$$

⁵For a given tax rate, and hence a given budget, targeting transfers will redistribute resources from non-targeted agents to targeted ones. Hence there will always exist some social welfare function for which the policymaker would choose not to target when the budget is fixed. As an example, if the social planner cared only for the rich and, then no targeting would be used when the budget is taken as fixed..

$$U_m(k, \tau) \equiv pu(N + \theta) + qu(N + 1 - \tau) \quad (7)$$

Hence poor agents' utility is a strictly increasing transformation of total transfers $N + \theta$.

To allow altruism, we introduce the overall utility function for middle income voters,

$$\begin{aligned} V_m(k, \tau; \alpha_m) &= (1 - \alpha_m)U_m(k, \tau) + \alpha_m U_l(k, \tau) \\ &= pu(N + \theta) + \alpha_m qu(N + \theta + \mu) + (1 - \alpha_m)qu(N + 1 - \tau) \end{aligned} \quad (8)$$

where α_m is the altruism coefficient for middle income voters: the greater is α_m , the more relative concern middle income agents show for the welfare of poor agents. It will be convenient to use the notation $V_l(k, \tau) = U_l(k, \tau)$, as we will assume that poor agents do not care about the welfare of either rich or middle income agents.

Since all rich agents work in the formal sector, their own-utility is simply

$$U_r(k, \tau) \equiv u(N + r(1 - \tau)) \quad (9)$$

Hence rich agents' own-utility is a strictly increasing transformation of their net consumption $N + r(1 - \tau)$. To allow altruism for rich agents, we define

$$V_r(k, \tau; \alpha_r) = (1 - \alpha_r)U_r(k, \tau) + \alpha_r U_l(k, \tau), \quad (10)$$

where α_r is the coefficient of altruism for rich agents.

To make things interesting, we assume that the function u is concave enough that middle income voters always want some positive level of taxation.

A 2 (Positive Taxation) *For any degree of targeting, the utility function u and the parameters of the model are such that middle income voters' overall utility is increasing in the tax rate when there is zero taxation.*

A sufficient condition for this assumption is $\lim_{c \rightarrow 0} u'(c) = \infty$, so that middle income workers are always better off buying some positive amount of consumption insurance (for any finite price). Any constant relative risk aversion utility function – e.g. log utilities – will satisfy this requirement.

2.2 Majority voting equilibrium

In our analysis of optimal policymaking in Section 3, we assume that the policymaker chooses a level of targeting, k , after which an election is held to determine the level of taxation. Our task in this subsection is therefore to describe the winning tax rate for each value of k .⁶ Typically, one requires that an equilibrium tax rate receives support from a majority of the population. In the present case, we will assume that no majority is possible without support from at least two types of agents. This assumption does not restrict the population shares σ_i , since it is possible that a given type of agent represents more than half the population but for some reason has less than half the political power in the society.⁷

⁶One might challenge our results on the grounds that our choice of political institution is *ad hoc*. However, we think that it reflects the critical issues quite accurately: policymakers typically have more scope over the design and administration of government programs than they do over the level of funding (in the U.S., for example, the President has much more discretion over program structure through rules making than he does over program funding, which of course must be approved by Congress).

⁷The assumption is restrictive in that we are choosing to focus only on cases when no one type of agent can implement a tax rate unilaterally. While such a situation could occur, it is uninteresting from a political

Hence we may treat the determination of the tax rate as a three-person voting game.

Under assumption A 1, all three utility functions V_l , V_m , and V_r are twice continuously differentiable and strictly concave in the degree of taxation. This fact implies that they are also single-peaked, so that a majority voting equilibrium tax rate (i.e. a Condorcet winner) always exists and is given by the median-preferred tax rate. Given the degree of targeting k , it will be convenient to define $\tau^*(k)$ as the value of the tax rate that solves the middle income FOC, i.e. $\partial V_m(k, \tau^*(k))/\partial \tau = 0$. We will need the following assumption, which ensures that middle income voters' preferred tax rate is always the Condorcet winner:

A 3 *Fix the degree of targeting k . Rich agents are never so altruistic that they prefer a greater tax rate than do middle income agents. That is, $\partial V_r(k, \tau^*(k))/\partial \tau \leq 0$.*

Since $\partial V_m(k, \tau^*(k))/\partial \tau = 0$ is the first order condition for middle income voters' optimal tax rate, given the degree of targeting, $\partial V_r(k, \tau^*(k))/\partial \tau \leq 0$ implies that at the given degree of targeting, rich voters oppose taxes greater than $\tau^*(k)$, preferring $\tau^*(k)$ instead. By concavity, we have established that both middle income and rich agents favor $\tau^*(k)$ over all greater tax rates (given that the degree of targeting k is fixed).

On the other hand, since poor voters never pay taxes but always receive transfers, they must favor all tax increases and oppose all reductions, no matter what the degree of targeting. Therefore, both middle income and poor agents prefer $\tau^*(k)$ over all lower tax rates. Therefore $\tau^*(k)$ defeats all other tax rates in any election requiring support from two or more agent types. Concavity of all utility functions then implies that (fixing the degree

economy perspective, so there is no harm in making it.

of targeting) no other tax rate can have this property. Hence $\tau^*(k)$ is the majority voting equilibrium given k .

We will say that a targeting-taxation policy (k, τ) is *politically feasible* if and only if $\tau = \tau^*(k)$. That is, a policy is politically feasible if and only if, given that the degree of targeting is k , the accompanying tax rate is the one that would be chosen through an election of the kind just described.

3 Social Welfare, Optimal Policy, and Nash Equilibrium

We argue in subsection 3.1 that the optimal policy with a fixed budget (i.e. with no political feasibility constraint) is full targeting.⁸ In subsection 3.2 we distinguish “sophisticated” policymaking – recognizing budgetary endogeneity – from “naive” policymaking – failing to recognize it. We define naive Nash equilibria and sophisticated Nash equilibria as situations in which (1) the policymaker’s targeting choice is optimal given the kind of policymaking involved and (2) the tax rate is politically feasible, given that targeting choice. We argue that a unique naive Nash equilibrium must exist, in which all revenues are spent on targeted transfers and none are spent on universal transfers.

In subsection 3.3, we focus on the set of politically feasible policies, discussing their welfare properties. In particular, we argue that on the set of politically feasible policies, the overall utility of both poor and middle income agents is strictly decreasing in the degree

⁸Because of the formal sector work constraint, “full targeting” may not mean setting $k = 1$, i.e. spending all revenues on targeted transfers. Except at very low tax rates, doing so would lead at least some agents to forgo formal sector work. For any tax level, we derive the full-targeting level of k below.

of targeting. By contrast, the opposite is true for the *own*-utility of rich agents. Moreover, we argue that social welfare will be strictly decreasing in the degree of targeting, from which it follows that there is a unique sophisticated Nash equilibrium, in which all revenues are spent on universal transfers and none are spent on targeted transfers.

3.1 Defining social welfare

We may write the social welfare function as

$$S(k, \tau) \equiv \sigma_l U_l(k, \tau) + \sigma_m U_m(k, \tau) + \sigma_r U_r(k, \tau), \quad (11)$$

Note that we have defined the social welfare function in terms of the *own*-utility functions U_i . There is no loss of generality here; we could as well define it over the overall utility functions V_i , with only notational differences arising.

Given a fixed budget, we could demonstrate optimality of full targeting by grinding out the first order condition, holding the tax rate constant. However, a more intuitive approach is available. The basic result to which we appeal is that a policymaker maximizing a weighted average of concave utilities will always want to undertake a policy that reduces the “spread” of the after-tax and -transfer income distribution.

By raising the sum of targeted and universal transfers $N + \theta$ but lowering the universal transfer N ,⁹ fixed-budget increases in targeting redistribute income from employed agents (who have income of either $N + 1 - \tau$, if middle income, or $N + r(1 - \tau)$, if rich) to unemployed ones (who have income of either $N + \theta$ or $N + \theta + \mu$). Such a policy moves population

⁹From the budget identities, we may write $N + \theta = [\bar{\delta} + (1 - \bar{\delta})k]\bar{y}/\bar{\delta}$, which is clearly increasing in k . By contrast, $N = (1 - k)\bar{y}\tau$ is decreasing in k .

density equal to $p(\sigma_l + \sigma_m)$ from the initial income level $(N + \theta)_0$ to the higher income level $(N + \theta)_1$, while moving the density $q\sigma_l$ from the initial income level $(N + \theta)_0 + \mu$ to the higher income level $(N + \theta)_1 + \mu$. At the same time, the increase in targeting reduces the universal transfer N (since a smaller share of the fixed budget is now spent on universal transfers), so that income for the density of $q\sigma_m + \sigma_r$ employed middle income and rich agents falls by $N_1 - N_0$. Technically speaking, the income distribution with k_0 is second order stochastically dominated by the distribution with k_1 . Hence for any increasing and concave utility function, it follows that fixed-budget targeting raises social welfare.

Thus it appears that fixed-budget increases in targeting should be pursued so long as these are feasible. However, except at low levels of taxation, high levels of targeting will make the combination of informal sector work and large targeted transfers more attractive to middle income or rich agents than formal sector work without targeted transfers. As such, for any tax rate τ there generally will exist a threshold level of targeting above which not all employed middle income and rich agents will choose formal sector work, violating assumption A 1.

To find this threshold level for middle income agents, we simply find the degree of targeting that makes an employed middle class agent just indifferent between sectors, given the levels of transfers that arise when all agents who can, choose to work in the formal sector. That is, we set $N + 1 - \tau = N + \theta + \mu$, where N and θ are as defined above (i.e. the tax base and takeup rate reflect the choice of all employed middle income and rich agents to work in the formal sector). Rewriting, we have the threshold level

$$\hat{k}(\tau) = \frac{\bar{\delta}(1 - \tau - \mu)}{\bar{y}\tau} \quad (12)$$

Hence for any τ and $k > \hat{k}(\tau)$, some positive fraction of employed middle income agents will choose work in the informal sector, while all of them (and all rich agents) choose formal sector work for any $k \leq \max[\hat{k}(\tau), 1]$. Thus $\hat{k}(\tau)$ is the highest degree of targeting, given the tax rate, for which all employed middle income and rich agents work in formal sector jobs. We refer to this degree of targeting as “full” targeting.^{10,11}

To sum up this subsection, the value of k that maximizes social welfare for any fixed degree of taxation is either 1 or the greatest value of k such that all rich and employed middle income workers choose to work in the formal sector. This result accords with economic intuition – that information should be used – and shows that we have not stacked the deck against targeting.

¹⁰Note that full targeting entails setting $k = 1$ for any tax no greater than $\bar{\delta}(1 - \mu)/(\bar{y} + \bar{\delta})$. This quantity is clearly positive, so that there will exist taxes low enough such that full targeting always entails zero universal transfers, i.e. spending the whole budget on the targeted transfer θ .

¹¹Gelbach (1997) shows that when k is increased a small amount above $\hat{k}(\tau)$, the tax base falls and the takeup rate rises quickly enough to more than offset the beneficial distributional impact of raising the degree of targeting. That is, there is a region on which increases in targeting cause employed middle income agents to switch continuously from the formal to the informal sector. Once all have switched, we again have a constant tax base and takeup rate, so that increases in targeting are locally improving. When the degree of targeting becomes great enough that rich voters are just indifferent between sectors, all further increases in k end up lowering social welfare. Hence either the degree of targeting \hat{k} or the value of k leaving rich voters indifferent between sectors must be optimal when the budget is fixed.

3.2 Nash equilibrium with naive and sophisticated policymaking

The naive policymaker does not recognize budgetary endogeneity. Instead, she takes the tax rate as fixed and then seeks to maximize social welfare over the degree of targeting. Since there is no guarantee that, given an arbitrary tax rate τ , the maximizing choice of k will satisfy political feasibility, we must incorporate this requirement explicitly into the definition of naive Nash equilibrium (NNE). Hence an NNE is any policy (k^*, τ^*) jointly satisfying the requirements

$$\begin{aligned} k^* &= \arg \max_{k \in [0,1]} S(k, \tau) \\ \tau^* &= \tau^*(k^*) \end{aligned} \tag{13}$$

We know from the previous subsection that full targeting is always optimal given a fixed tax rate. Now, under assumption A 1, we have $\tau^*(k) < \tau_m^a(k)$ in any equilibrium. Thus no politically feasible policy $(k, \tau^*(k))$ can entail full targeting unless $k = 1$, i.e. all revenues are spent on the targeted transfer. That is, for any politically feasible tax and level of targeting at which any revenues are spent on the universal transfer N , it is always possible to increase the degree of targeting a small amount while keeping the tax rate fixed and maintaining the tax base. It therefore follows that the only possible NNE is $(1, \tau^*(1))$. In fact, since this policy is politically feasible while satisfying (13), it actually must be a naive Nash equilibrium. Therefore, there is a unique NNE at $(1, \tau^*(1))$, where all revenues are spent on the targeted transfer and none on the universal one.

Turning now to sophisticated policymaking, we define a sophisticated Nash equilibrium

(SNE) as any policy $(k^*, \tau^*(k^*))$ that satisfies the following:

$$k^* = \arg \max_{k \in [0,1]} S(k, \tau^*(k)), \quad (14)$$

The sophisticated policymaker recognizes that the politically feasible tax rate will depend on the degree of targeting. Because the politically feasible tax rate τ^* is the solution to middle income voters' first order condition, it must vary continuously with the degree of targeting k .¹² Existence of a sophisticated Nash equilibrium is thus reduced to noting that a continuous function takes a maximum on a compact set. Any value of k at which this maximum is obtained, k^* , is then an optimal choice for the sophisticated policymaker, so any policy $(k^*, \tau^*(k^*))$ is thus a sophisticated Nash equilibrium. Existence of each kind of Nash equilibrium is thus proved.

3.3 Sophisticated Nash equilibrium and welfare properties of politically feasible policies

In this subsection, we demonstrate that total transfers $N + \theta$ are strictly decreasing in the degree of targeting on the set of politically feasible policies. This fact effectively reverses the second order stochastic dominance argument used above, so that income distributions with lower levels of targeting dominate those with higher levels. It follows that social welfare is also strictly decreasing in the degree of targeting, so that the unique naive Nash equilibrium *minimizes* social welfare on the set of politically feasible policies.

¹²Actually, without assumption A 1, this result is not guaranteed. In fact, it is possible that there is a single \bar{k} at which the majority voting equilibrium τ^* both jumps up and can have either of two values. Gelbach (1997) offers a full description of the majority voting equilibrium correspondence.

We begin by reformulating middle income voters' optimization problem (choosing the equilibrium tax rate) into one that looks like a standard consumer theory problem. This approach has the advantage of making it clear what "goods" are being traded off against one another. Define $z = N + \theta$, so that z is the amount of consumption insurance purchased by a targeting-taxation policy; hence z is received by all poor and unemployed middle income agents. Next, from the definitions of N and θ , we have $N + \theta = [\bar{\delta} + k(1 - \bar{\delta})]\bar{y}\tau/\bar{\delta}$ and $N + 1 - \tau = 1 - [1 - \bar{y} + k\bar{y}]\tau$. Therefore we may write

$$N + 1 - \tau = 1 - \pi(k)z, \quad (15)$$

where $\pi(k)$ is defined as follows:

$$\pi(k) \equiv \left(\frac{1 - \bar{y} + k\bar{y}}{\bar{\delta} + [1 - \bar{\delta}]k} \right) \begin{pmatrix} \bar{\delta} \\ \bar{y} \end{pmatrix} \quad (16)$$

Intuitively, $\pi(k)$ is the price of insurance when the degree of targeting is k . Fixing the degree of targeting (and thus the price π) and denoting middle income agents' net income when employed as w , we have thus transformed the problem of maximizing middle income agents' utility into the following one:

$$\max_{w,z} f(z) + g(w) \text{ s.t. } w + \pi z = 1, \quad (17)$$

where each of $f(z) = pu(z) + \alpha_m qu(z + \mu)$ and $g(w) = (1 - \alpha_m)qu(w)$ is strictly increasing and strictly concave. Intuitively, $f(z)$ is the expected utility received by a middle income voter from resources consumed by a representative poor agent as well as the resources that the middle income agent herself receives if unemployed. The middle income agent receives

expected utility of $g(w)$ from resources she will consume if she is employed (given that she will want to work in the formal sector).

The solution to the problem in (17) is given by that value of z that solves $f'(z)/g'(1 - \pi z) = \pi$. We are interested in the effects of changes in the degree of targeting k on the optimal level of z satisfying this first order condition. The analogy to consumer theory ends here, because changes in k have a direct impact on z , since $z = [\bar{\delta} + (1 - \bar{\delta})k]\bar{y}\tau/\bar{\delta}$. In fact, changes in z have three effects. First, by raising the level of insurance z , they increase income received by recipients of the targeted transfer. As a result, marginal utility of those agents, given by $f'(z)$, must fall when k is increased.

Second, increases in the degree of targeting raise the price of insurance, i.e. $\pi'(k) > 0$. In demonstrating this fact, it will be useful to consider the percentage change in the price of insurance π for a small change in the degree of targeting k . That is, taking the natural log of the price π and differentiating it with respect to the degree of targeting, we have

$$\frac{d \ln \pi}{dk} = \frac{\bar{y}}{1 - \bar{y} + k\bar{y}} - \frac{1 - \bar{\delta}}{\bar{\delta} + (1 - \bar{\delta})k} \quad (18)$$

The first term on the RHS of (18) arises due to the impact of greater targeting on employed-state income for middle income agents: an increase in targeting reduces the fraction of the budget spent on universal transfers, thereby reducing employed-state income – and raising the price of unemployed-state insurance – accordingly. On the other hand, an increase in the degree of targeting also means that the share of tax revenues going to nonrecipients of the targeted transfer – or the fraction $(1 - \bar{\delta})$ of the population – will be lower, meaning that the level of insurance z will be greater (for fixed τ). This effect,

represented by the second term on the RHS of (18), tends to lower middle income agents' price of insurance.

Whether the price of insurance rises or falls depends on which of these effects is larger. The price will tend to rise when we have either or both of a large tax base – representing foregone universal transfer revenues – or a large takeup rate – representing relatively small increases in the size of the targeted transfer for given increases in the degree of targeting. Cross-multiplying terms on the RHS of (18) implies that it will be positive if and only if

$$1 < \bar{y} + \bar{\delta} \tag{19}$$

Now, $\bar{y} + \bar{\delta} = (\sigma_r r + q\sigma_m) + (p\sigma_m + \sigma_l)$, which can be rewritten as $\sigma_r r + \sigma_m + \sigma_l$. Since $r > 1$, (19) therefore must be satisfied; therefore the price of insurance is strictly increasing in the degree of targeting.

The third effect of an increase in k is to reduce consumption of employed middle income agents. To see this fact, note that their consumption is $N + 1 - \tau = 1 - \tau[1 - \bar{y} + k\bar{y}]$, or $1 - \pi z$. The expression involving k explicitly is obviously decreasing in k , while we have seen that both π and z are increasing in k ; either way, it is clear that middle income agents' employed-state consumption falls with an increase in targeting.

Now, when the degree of targeting is increased, all three of these effects make total transfers z too high to satisfy the first order condition for the consumer theory problem above. Hence if they are to maintain satisfaction of their FOC, middle income voters must vote to reduce the tax rate, thereby reducing total transfers $z = N + \theta$.¹³

¹³The total effect on their employed-state consumption, $N + 1 - \tau$, cannot generally be signed. On the

Hence we have established an important result: *politically feasible increases in the degree of targeting must reduce total insurance* $z = N + \theta$. Moreover, since poor agents' utilities may be written entirely as a strictly increasing function of z (i.e. $V_l = pu(z) + qu(z + \mu)$), it follows that poor agents' utility is strictly decreasing in the degree of targeting – “more for the poor” *is* less for the poor when political feasibility is respected.

Moreover, by the envelope theorem, the only effect of an increase in the degree of targeting k on middle income voters' utility is $\partial V_m / \partial k$; in terms of the consumer theory analogy, this effect is equivalent to $[\partial V_m / \partial \pi][\partial \pi / \partial k]$.¹⁴ Thus we are left with $dV_m / dk = -zg' \partial \pi / \partial k$, which is negative (since each of z , g' , and $\partial \pi / \partial k$ is positive). Therefore, middle income voters' utility also is strictly decreasing in the degree of targeting on the set of politically feasible policies.

As for rich agents, it is straightforward to show that $\tau > 1$ implies that if total transfers one hand, the increase in targeting reduces the budgetary share and hence the size of the targeted transfer N . On the other hand, the induced fall in the tax rate raises the term $N - \tau$. To see this fact, note that assumption A 1 can hold only if $\bar{y} < 1$; otherwise middle income voters would always benefit from higher taxes when there is no targeting (i.e. $k = 0$) since we would have $N - \tau = \tau[\bar{y} - 1]$. In this case, both middle income and poor voters would always prefer $\tau_m^a k$, the maximum tax rate for which all employed middle income and rich agents choose formal sector work, to any lower tax rate, thereby violating the assumption.

¹⁴To see this fact, note that

$$\begin{aligned} \partial V_m / \partial k &= f'(z) \partial z / \partial k - [\partial(\pi z) / \partial k] g'(1 - \pi z) \\ &= [f' - \pi g'] \partial z / \partial k - z g' \partial \pi / \partial k \end{aligned}$$

But $[f' - \pi g'] = 0$ by the FOC for an optimum in z , leaving only the term $-z g' \partial \pi / \partial k$, which is what we get by applying the envelope theorem to the consumer theory problem.

$N + \theta$ are decreasing in the degree of targeting (as we have just shown), then rich agents' consumption $N + r(1 - \tau)]/dk > 0$ must be increasing in the degree of targeting.¹⁵ That is, if increases in the degree of targeting reduce the amount of consumption insurance z , then the tax rate must fall by enough to offset rich agents' lower universal transfers with greater after-tax labor income, thus *increasing* their post-policy income. Hence rich agents' own-utility must also be strictly increasing in the degree of targeting. It follows that for

¹⁵Totally differentiating and rearranging $N + \theta = [\bar{\delta} + (1 - \bar{\delta})k]\bar{y}\tau_m^*(k)/\bar{\delta}$ with respect to k and noting that this derivative must be negative, we have

$$-\frac{1}{\tau_m^*(k)} \frac{d\tau_m^*}{dk} > \frac{1 - \bar{\delta}}{\bar{\delta} + (1 - \bar{\delta})k} \quad (20)$$

Now, writing $N + r(1 - \tau_m^*(k)) = r - \tau_m^*(k)[r - \bar{y} + k\bar{y}]$, we may differentiate this term and rearrange so that $N + r(1 - t)$ is increasing in k iff

$$-\frac{1}{\tau_m^*(k)} \frac{d\tau_m^*}{dk} > \frac{\bar{y}}{r - \bar{y} + k\bar{y}} \quad (21)$$

Since (20) must hold, if we can show that its RHS exceeds the RHS of (21), then (21) will hold as well.

The derivation works as follows:

$$\begin{aligned} \frac{1 - \bar{\delta}}{\bar{\delta} + (1 - \bar{\delta})k} &> \frac{\bar{y}}{r - \bar{y} + k\bar{y}} \Leftrightarrow \\ (1 - \bar{\delta})[r - \bar{y} + k\bar{y}] &> \bar{y}[\bar{\delta} + (1 - \bar{\delta})k] \Leftrightarrow \\ (1 - \bar{\delta})[r - \bar{y}] &> \bar{y}\bar{\delta} \Leftrightarrow \\ r(1 - \bar{\delta}) &> \bar{y}[\bar{\delta} + (1 - \bar{\delta})] = \bar{y} \end{aligned}$$

Thus we require $(q\sigma_m + \sigma_r)r > q\sigma_m + \sigma_r r$, which must hold since $r > 1$. Therefore rich agents' income must be increasing in k .

any values of the other parameters of the model, there will exist some positive degree of altruism for rich voters, α_r , such that their overall utility also will be strictly increasing in the degree of targeting on the set of politically feasible policies.

This finding presents the politics of targeting in a stark light: since middle income and poor voters' utility is strictly decreasing in the degree of targeting on the set of politically feasible policies, if rich voters' utility is strictly increasing then it follows that any politically feasible policy is Pareto efficient in the set of politically feasible policies. The "efficiency" argument for targeting can hardly hold up under such circumstances. Of course, when labor disutility is variable, so that targeting allows lower – and hence less distortionary – labor income taxes, this result will be less likely to hold. However, because our results hold strictly in the economy we consider, there will always exist some generalization of this economy, incorporating the desired improvements, such that all the results carry through.¹⁶

To sum up the results of this section, we have shown that conventional wisdom regarding the optimality of targeting should be stood on its head. Where the conventional approach is to take the budget as fixed and maximize social welfare with respect to the degree of targeting, we show that this procedure *minimizes* social welfare in political equilibrium. Where conventional wisdom suggests that at least some targeting should be used, we show

¹⁶For example, suppose that there is some additive disutility of labor supply, $v(l; \rho)$, where l is the fraction of an agent's time spent working (so that middle income voters who work l receive earnings of l , while rich voters receive rl), and ρ is some parameter such that $v(l; 0) = 0$ for all l . Then our results are what one would get by including labor disutility of that form but evaluating at $\rho = 0$. Under sufficient continuity conditions on v with respect to ρ , there will always exist a $\rho > 0$ for which all of our results continue to hold.

that social welfare is maximized in political equilibrium only when all revenues are spent on universal transfers and none spent on targeted ones. Where conventional wisdom says that targeting should benefit the poor, have ambiguous effects on the middle income, and redistribute from the rich, we show that targeting redistributes from the poor, makes the middle income worse off, and benefits the rich in political equilibrium. It seems difficult to imagine a more complete reversal of what admittedly reasonable, other-things-equal analysis would suggest at first glance.

4 Summary and Extensions

Our main objective in this study has been to assess the welfare properties of targeted income support transfers when a basic political feasibility condition is imposed on the levels of targeting and taxation. In the economy we consider, full targeting would be optimal if the budget could be taken as fixed. The intuition here is simple: when the budget is fixed, increasing the degree of targeting amounts to reallocating consumption from rich and employed middle class agents to poor and unemployed agents. Since this process contracts the income distribution while maintaining the mean level of income, it must increase the integral of utilities.

However, when the budget is determined by majority voting, we find that the equilibrium tax rate falls sharply enough that transfers to poor and unemployed agents are actually decreasing in the degree of targeting, while they increase consumption for rich agents. Thus any increase in the degree of targeting induces a mean-preserving spread of the income distribution, reducing social welfare.

The idea that narrowing the group of voters receiving a program's benefit might also reduce overall political support for that program of course is not new, its possibility having been discussed at length over the years among both political scientists and political economists. Nonetheless, we know of no prior attempt to formalize the issue in any coherent way, by contrast to the large economic literature – both theoretical and empirical – that considers targeting while ignoring politically-driven budgetary endogeneity.

The economy we consider is admittedly very simple, even beyond the assumption that the formal sector work constraints are always satisfied. In particular, it would be nice to allow the tax base to vary continuously with the tax rate, as in standard labor supply models. Unfortunately, such an approach adds an unmanageable degree of complexity to the various components of a modelling endeavor like this one. Nonetheless, our results hold strictly in the economy we consider. Therefore, there will always exist some generalization of this economy, incorporating the desired improvements, such that all results endure. Moreover, the benefit of treating such a simple case is large: our results do not depend on the structure of individual preferences, holding for all increasing and concave utility functions, while also allowing large degrees of altruism for both middle income and rich voters.

Lastly, our results suggest important implications for how economists should think about private insurance markets. In particular, if social insurance is an important motive for politically determined redistributive taxation, then it seems possible that thicker insurance markets could reduce social welfare. As middle class voters become more able to diversify in private markets, they may no longer see their welfare as dependent on social insurance and

reduce their political support for it as a result. Also, to the extent that programs like Social Security and Medicare perform both redistributive and insurance functions, privatization plans that separate these roles might well reduce political support for the redistributive component, possibly lowering social welfare.

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Table 1*Agents' Characteristics*

Type	Pop Share	Max Marg Prod	Prob Unemp	Get θ ?
Low	σ_l	μ	p	<i>Always</i>
Middle Class	σ_m	1	p	<i>If unemployed</i>
Rich	σ_r	r	0	<i>Never</i>

Policy Parameters and Variables

θ	Targeted transfer
N	Universal (untargeted) transfer
τ	Tax rate
k	Budget share spent on θ
\bar{y}	Tax base = $q\sigma_m + \sigma_r r$
$\bar{\delta}$	Takeup rate = $\sigma_l + p\sigma_m$
$\tau_m^a(k)$	Maximum tax for which all middle class and rich workers choose formal sector work, given k .

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