The Political Economy of Targeting

Philippe De Donder
(Toulouse School of Economics)

Canazei, January 2013

1. Introduction

- Definition of targeting: concentrating welfare benefits on subset of population.
- Need for targeting seems obvious: basic requirement of efficiency.
- Very timely issue: USA, France, etc.
- Raises several problems:
  - Identifying the needy, or deserving. Low take-up of transfers because of administrative complexity or stigma.
  - Incentives: increases marginal rate of taxation.
  - Political problem : "A program for the poor is a poor program": lack of political support.

- Lecture focuses on last two points.

Outline of the Presentation

1. Introduction
2. A simple model focused on redistribution: De Donder-Hindriks (1998)
   - 2.1 The Model
   - 2.2 Voting over the tax rate for given amount of targeting
   - 2.3 Voting over both tax rate and amount of targeting
3. Introducing insurance: Moene-Wallerstein (2001, EofG)
   - 3.1 The Model
   - 3.2 Voting over the tax rate for given amount of targeting
   - 3.3 Calibrated example

2. A simple model focused on redistribution: De Donder & Hindriks (Public Choice, 1998)

2.1. The model

- n agents differ in their productive ability: $0 < a_1 < a_2 < ... < a_n$, uniformly distributed over $[0, 1]$.
- Preferences given by

$$U(x, y; a) = x - \frac{(y/a)^2}{2},$$

  where x measures consumption and y pre-tax income.
- Quasi-linearity important: no income effect on labor supply when changes welfare participation.

- Government: taxes labor income at rate t and serves a transfer that decreases at rate τ with (pre-tax) labor income:

$$\begin{aligned} T(y_i) &= b - \tau y_i \text{ for } y_i \leq b/\tau, \text{ so that } i \in R(b,t,\tau) \\ &= 0 \text{ otherwise, so that } i \in NR(b,t,\tau). \end{aligned}$$

- Government budget constraint:

$$\sum_{i \in R(b,t,\tau)} b = \sum_{i \in R(b,t,\tau)} (t+\tau) y_i(b,t,\tau) + \sum_{i \in NR(b,t,\tau)} t y_i(b,t,\tau),$$

where y_i solves

$$\max_y \; x - \frac{(y/a)^2}{2}$$

subject to

$$\begin{aligned} x &= b + (1-t-\tau)y \text{ if } y_i \leq b/\tau, \\ x &= (1-t)y \text{ otherwise.} \end{aligned}$$

- Figure 1: The choice between being recipient or not.
- Figure 2: $b(t, \tau)$ is a complex object.

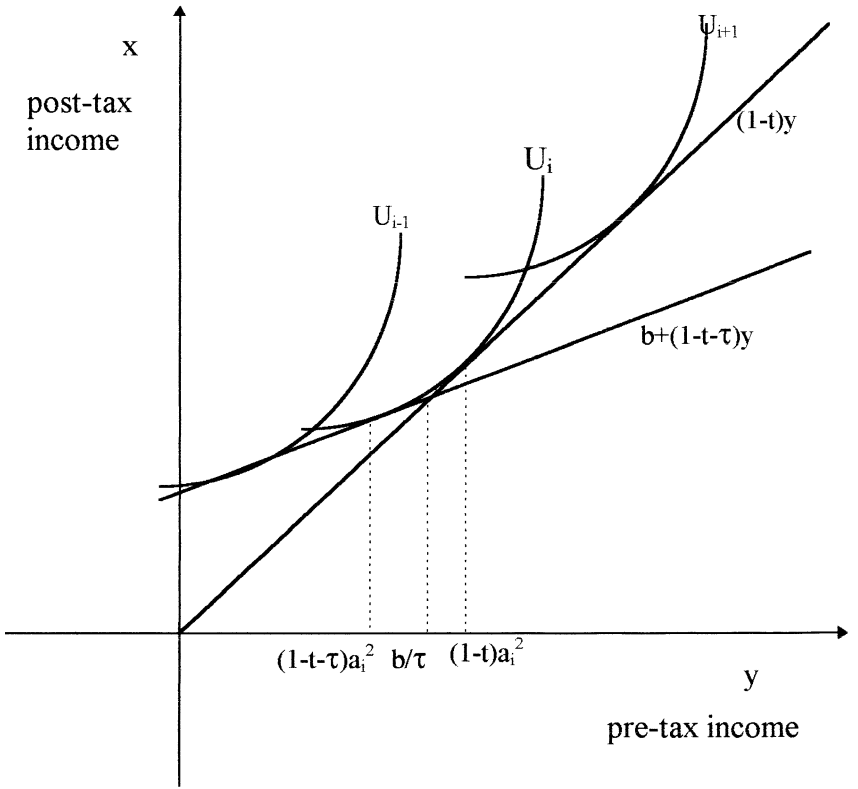


Figure 1. Optimal labour supply decisions where agent i is indifferent between welfare participation or not. Lower ability agents strictly prefer participating and higher ability agents strictly prefer opting out

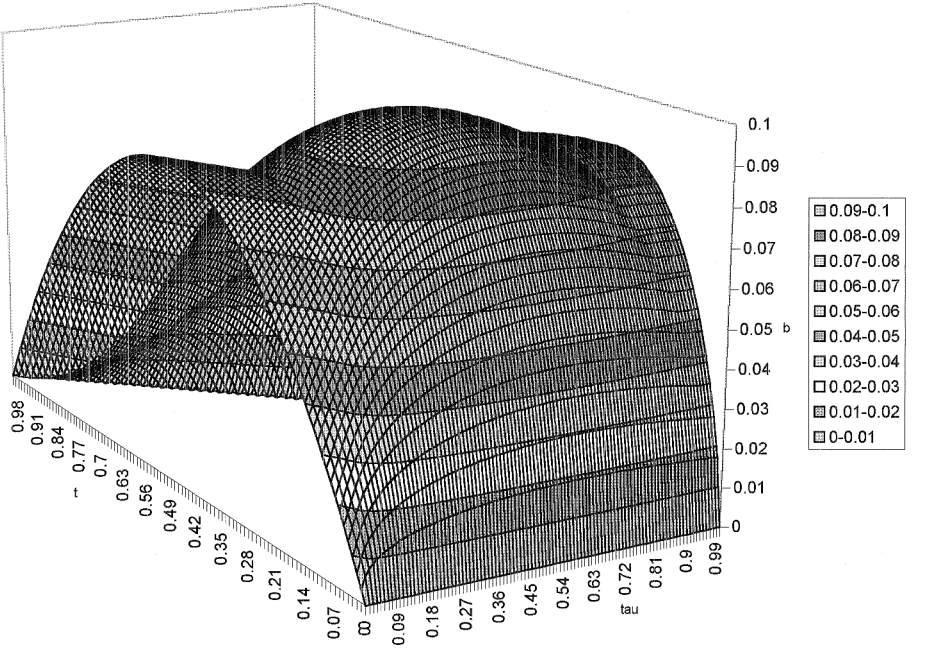


Figure 2. Dupuit-Laffer surface.

2.2. Voting over t for given τ, or why targeting may be fatal for redistribution

- Changing the funding level may be easier than altering the program's design.
- Timing: τ set exogenously, agents vote over t and then choose their pre-tax income y_i (i.e., labor supply).
- Equilibrium concept: Condorcet winner: value of τ preferred by a majority of voters to any other value.
- Existence: two versions of the "median voter theorem" with single-dimensional policy space and traits space:
  - Preferences are not single-peaked: see Figure 3.
  - Preferences are single-crossing, so that agent with the median value of productivity is decisive.

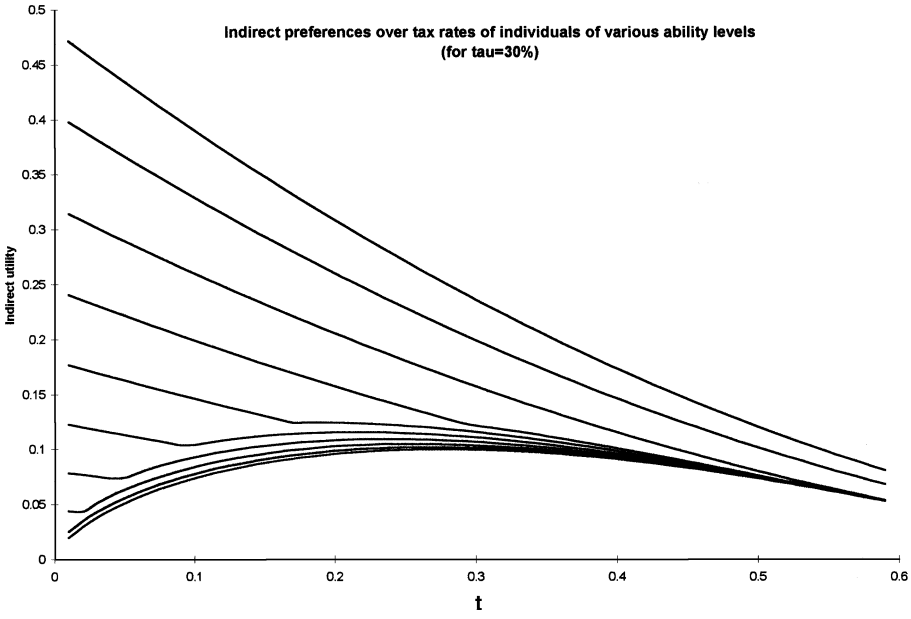


Figure 3. Indirect preferences over tax rates of individuals of various ability levels (for tau = 30%).

Most-preferred value of t of the median ability agent as a function of τ: see Figure 4.

Three zones:

- Zone 1: low values of τ: everybody receives the welfare benefit, so that t and τ are perfectly substitutable. Remark: even with uniform distribution of productivities, median income is lower than average income (because y_i proportional to square of a_i)
- Zone 2: intermediate values of τ: as richer agents opt out, they generate tax proceeds and become "exploited" by majority.
- Zone 3: sudden disappearance of political support, when three quarters of agents are on welfare. See Figure 5.

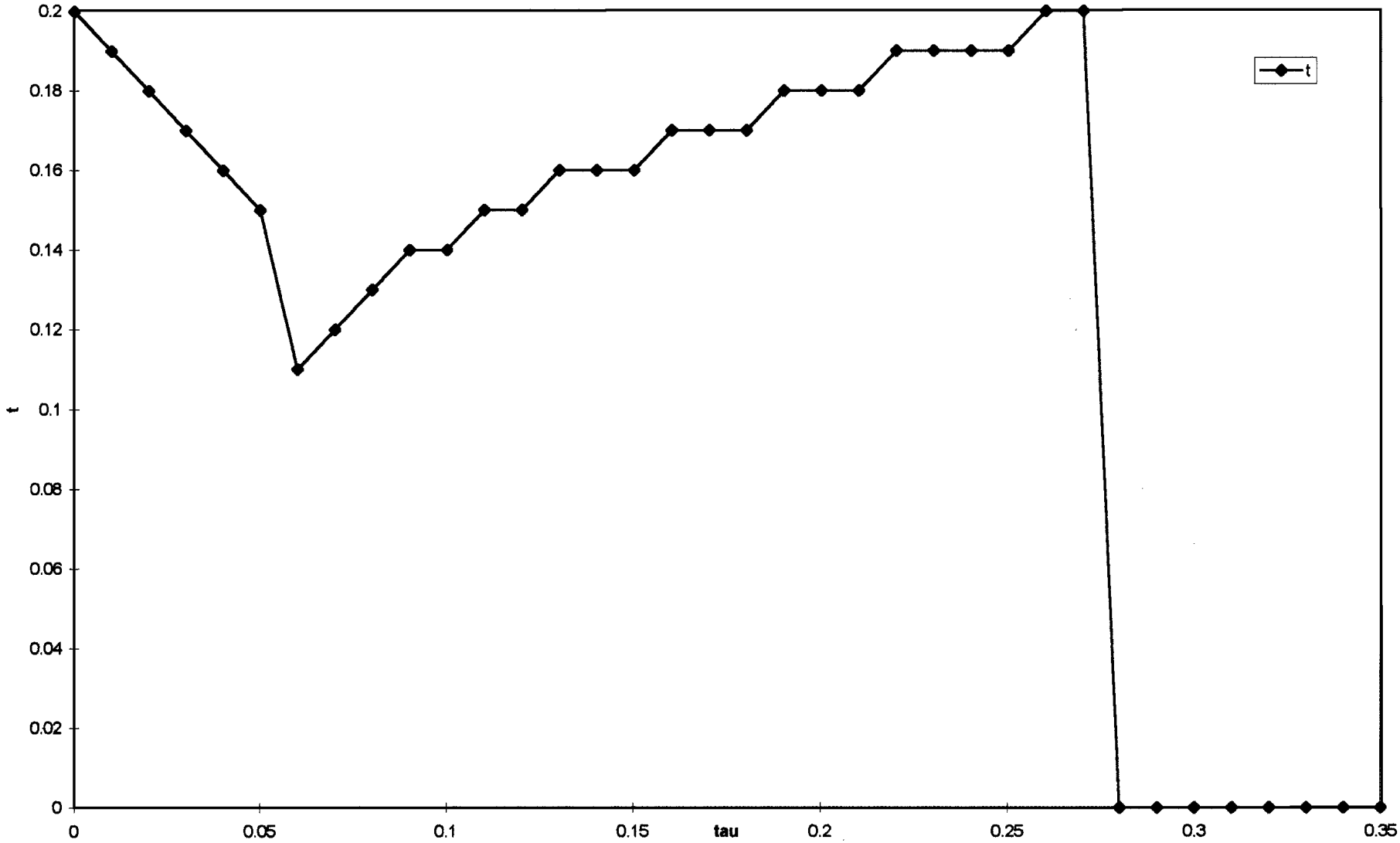


Figure 4. Marginal tax rates selected by majority voting for various degrees of targeting.

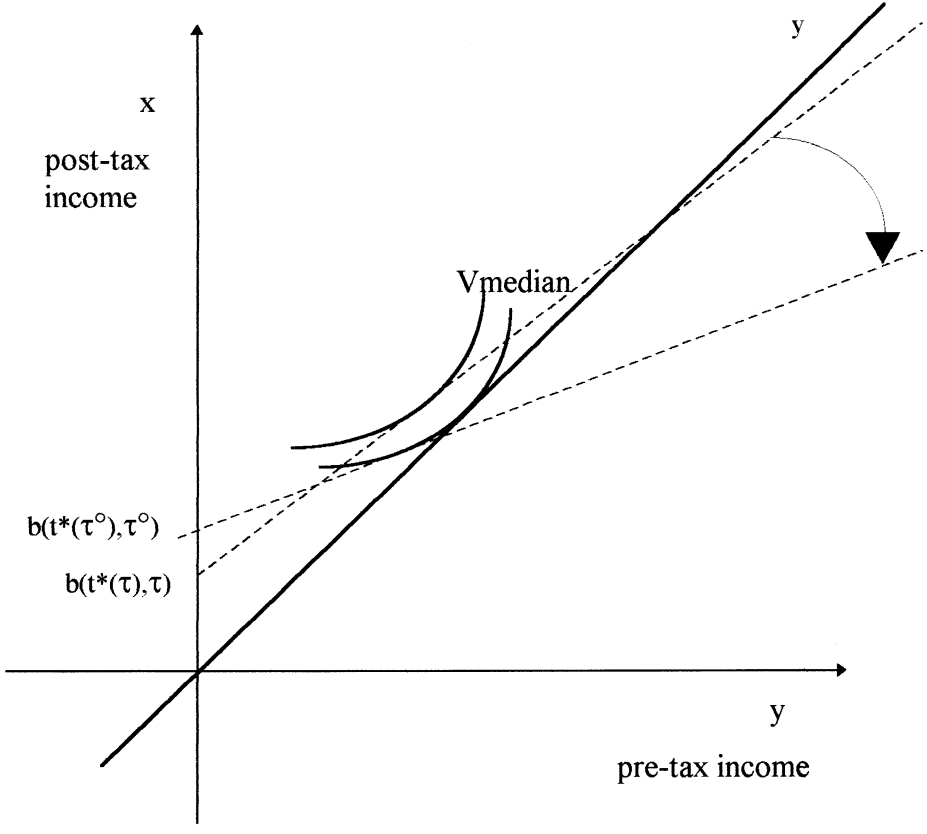


Figure 5. When targeting may be fatal for redistribution. Increasing τ rises $t^*(\tau)$ and $b(t^*(\tau), \tau)$, which provokes a clockwise rotation of the median voter budget line up to the point $\tau = \tau^\circ$ where he starts favouring zero taxes.

- **Main conclusion**: impossible to support targeting of less than one half of population, and lower bound probably much larger than one half.
- **Intuition**: Median voter prefers laissez-faire even to being in the targeted majority.

2.3. Voting over t and τ

- Well known that no equilibrium if vote simultaneously over t and τ.
- Issue-by-issue voting has 2 drawbacks:
  - May not have Condorcet winner when voting over τ for given t,
  - Such a procedure may choose a Pareto dominated option (see Gevers & Jacquemin (EER, 1987))
- We focus on "bipartisan" competition (à la Hotelling) where both parties maximize their vote shares.

2.3.1. Deletion of weakly dominated strategies

- Corresponds to Uncovered set in social choice theory.
- In general a subset of the Pareto set, but here corresponds to Pareto set: see Figure 6.
- Small and large values of τ are Pareto dominated:
  - No targeting (τ close to zero) Pareto dominated because should induce highest ability people to opt out: see Figure 7.
  - Too much targeting Pareto dominated: Laffer-type effect.

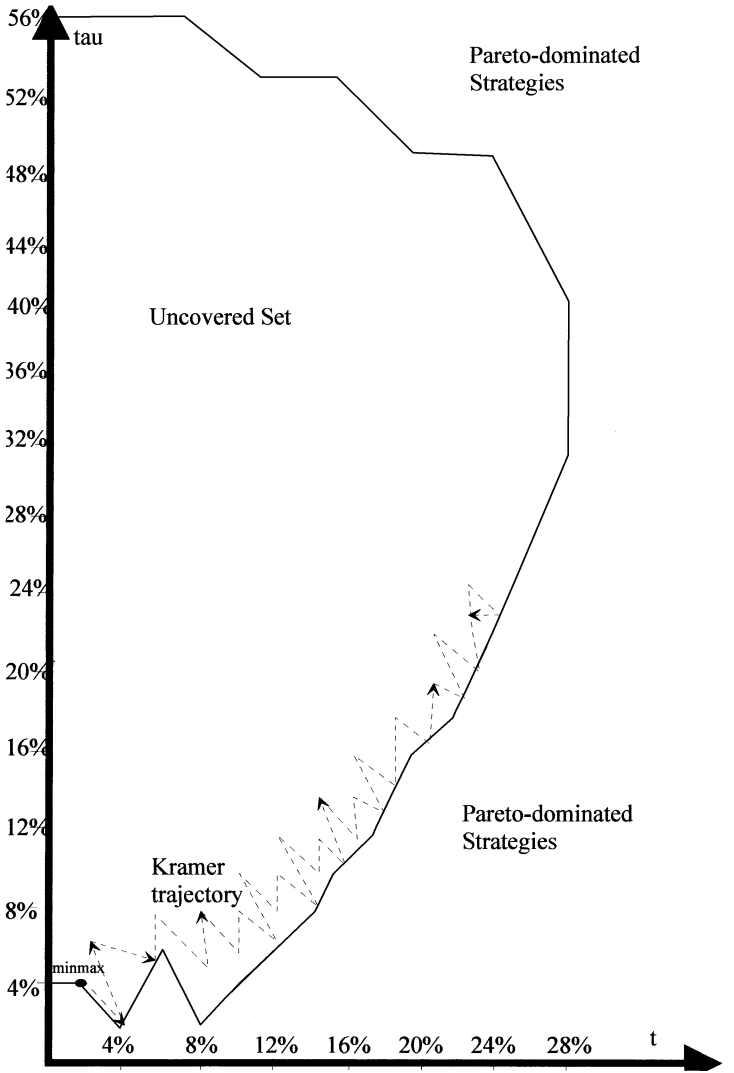


Figure 6. Uncovered set, Pareto-dominated strategies and the Kramer's trajectory.

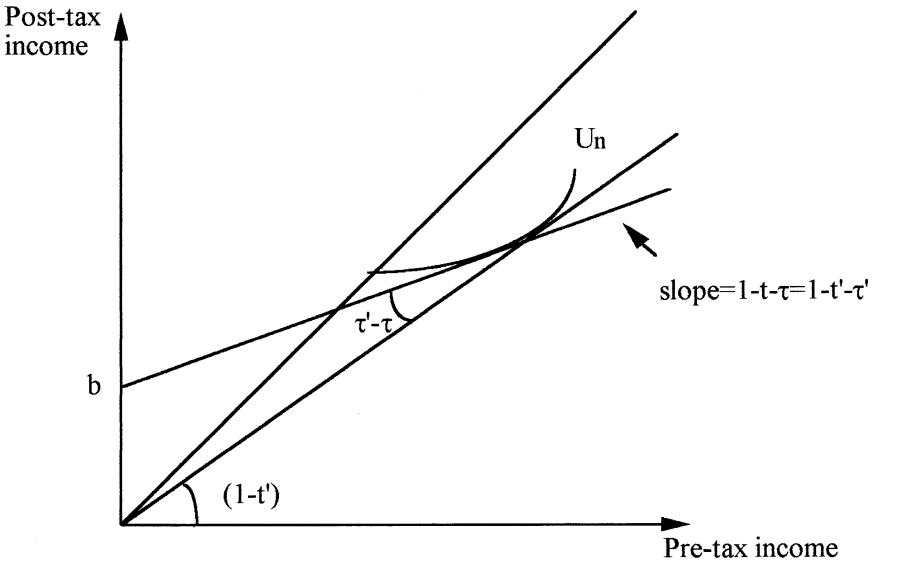


Figure 7. Why having everybody on welfare is Pareto-dominated.

2.3.2. Dynamic competition à la Kramer:

- Repeated game, where the winner (incumbent) sticks with its policy and where the parties are "myopic".
- Trajectory starts from minmax: poor alternate with rich (to increase τ and decrease t) and with middle-class (to increase t and reduce τ)
- Cycle: small, three quarters of beneficiaries. All trajectories (whatever starting point) end up with same cycle.

2.4. Conclusion

- Too little and too much targeting are Pareto dominated.
- Targeting kills the support for redistribution way before 50% of the voters receive the transfer.
- Complex political economy of simultaneous setting of t and τ.

3. Introducing insurance: Moene and Wallerstein (2001, Economics of governance)

3.1. The model

- Income w_i given as

$$w_i = y_i z_i,$$

where y_i is productivity and z_i is random draw (independent from y_i) with $E(z_i) = 1$.

- All three distributions (w, y, z) are lognormal, so that median is less than mean.

- Preferences are given by

$$U(c_i(n_i), n_i),$$

where n_i measures labor supply and c_i consumption. Assume U concave, consumption and leisure both normal goods, and Inada conditions.

- Welfare policy similar to previous paper: proportional tax at rate t pays a benefit b to those with zero income, and benefit decreases at rate $1-\alpha$ times after-tax earnings, so that transfer received is

$$B(w_i, n_i) = \max(b - (1-\alpha)(1-t)w_i n_i, 0).$$

- Paper concentrates on vote over t for given α.

3.2. Voting over t for given α

- Sequence of choices:
  - Agents know y_i and α and the distribution of z_i.
  - They vote over t.
  - They learn the realization of z_i.
  - They choose labor supply n_i.
- Preferences satisfy the single-crossing property.
- Observe that they vote over lotteries, and that there is an income effect on labor supply.

Proposition 1: Assume universalistic welfare ($\alpha = 1$). Then the median voter prefers a small positive value of t to zero.

- **Intuition**: with median income lower than average income, both redistribution and insurance motives.
- To isolate insurance: assume symmetrical distribution of income, so that median equals average. Median stills prefers $t > 0$ to $t = 0$.

Proposition 2: Assume maximum targeting ($\alpha = 0$). The median voter prefers $t = 0$ if the marginal utility of consumption remains finite or does not increase "too fast" as consumption goes to zero.

- **Remark**: local results, for preferences around $t = 0, 1$ and $\alpha = 0, 1$.

3.3. Calibrated example

- Log-linear preferences

$$U(c_i, n_i) = (1 - \lambda) \ln(c_i) + \lambda \ln(1 - n_i),$$

  where λ measures

  – the relative preference for leisure,
  – the share of total income (if $n_i = 1$) that is "spent" on leisure when its price is the wage income foregone,
  – "total labor elasticity".

- To calibrate, we need to specify

  – (i) overall distribution of income,
  – (ii) distribution of stochastic shock to the median voter's income,
  – (iii) λ.

Results: Table 1.

- With $E(w_i) = 1$, benefit level is expressed as percentage of mean wage.
- Deadweight loss: percentage reduction of aggregate income compared to laissez-faire.
- Cost of given (t, α) in reducing labor supply increases with λ.
- $t = 0$ if α low : minimum fraction receiving benefit is two thirds.
- Bunching at zero labor supply increases with targeting, and also deadweight loss.
- Benefit level may decrease with targeting!

Table 1. The effect of tageting on the political equilibrium

Targeting parameter α:	0	0.25	0.50	0.75	1.00
$\lambda = 0.1$					
Tax rate	0	0.29	0.40	0.46	0.57
Benefit level	0	0.45	0.49	0.46	0.45
Deadweight loss	0	0.18	0.16	0.13	0.12
Fraction receiving benefits	0	0.66	0.89	0.98	1.00
Fraction not working	0	0.11	0.04	0.01	0.01
$\lambda = 0.3$					
Tax rate	0	0	0.30	0.34	0.44
Benefit level	0	0	0.28	0.27	0.25
Deadweight loss	0	0	0.25	0.21	0.19
Fraction receiving benefits	0	0	0.76	0.93	1.00
Fraction not working	0	0	0.16	0.06	0.04
$\lambda = 0.5$					
Tax rate	0	0	0.30	0.31	0.39
Benefit level	0	0	0.17	0.16	0.15
Deadweight loss	0	0	0.31	0.28	0.24
Fraction receiving benefits	0	0	0.73	0.91	1.00
Fraction not working	0	0	0.30	0.14	0.08

Notes: Parameter values are $\sigma_y^2 = 0.4$, $\sigma_z^2 = 0.2$ and $\sigma_w^2 = 0.6$.

Conclusion: only way to support minority targeting is to add altruism

$$E(U(c_i, n_i)) + AU(b, 0).$$

See Figure 2 for $A = 0.05$ and $A = 0.1$

Table 2. Political equilibrium with partially altruistic voters

Targeting parameter α:	0	0.50	1.00
$A = 0.05$			
Tax rate	0.015	0.33	0.48
Benefit level	0.11	0.29	0.26
Deadweight loss	0.02	0.27	0.21
Fraction receiving benefits	0.10	0.79	1.00
Fraction not working	0.10	0.18	0.06
$A = 0.1$			
Tax rate	0.03	0.34	0.50
Benefit level	0.13	0.29	0.27
Deadweight loss	0.04	0.27	0.23
Fraction receiving benefits	0.15	0.79	1.00
Fraction not working	0.15	0.19	0.07

Notes: Parameter values are $\lambda = 0.3$, $\sigma_y^2 = 0.4$, $\sigma_z^2 = 0.2$ and $\sigma_w^2 = 0.6$

4. Introducing employment status: Moene-Wallerstein (2001, APSR)

- Impact of income inequality on the support for welfare policies depends on how benefits are targeted.
- Canonical model with universalistic benefits: support increases with inequality measured by gap between median and average income.
- Does not fit well stylized facts (ex: Sweden vs USA).
- In reality, welfare benefits mix redistribution and insurance (not provided by private markets). If insurance is a normal good, than poorer median will want lower benefits.
- **Question**: which effect is larger, and link with targeting of benefits.

4.1. The model

Two ingredients: uncertainty regarding future and heterogeneity in income and risk.

4.1.1. The agents

- Three groups:
  - fraction σ_0 is permanently out of labor market (no labor income),
  - fraction σ_L is low wage (w_L) earners;
  - fraction σ_H is high wage (w_H) earners (with $w_H > w_L$ and $\sigma_0 + \sigma_L + \sigma_H = 1$).
- All high wage earners are employed.

- Low wage earners face probability α of losing their job if currently employed, and probability β of finding a job if currently unemployed.
  $=> \alpha/(\alpha+\beta)$ is
  - fraction of low wage earners employed at any time,
  - long run fraction of time that a low wage earner is employed.
- At any point in time,
$$e = \sigma_H + \frac{\beta}{\alpha+\beta}\sigma_L$$
  is the fraction of the population currently employed.
- Assume that $e > 1/2$ and that $\sigma_H < 1/2$ so that the employed low wage earners are the median income earners.

4.1.2. Fiscal policy

- Proportional tax on labor income at rate t.
- Spending per capita $T(t)$ is given by

$$T(t) = \tau(t) e \bar{w},$$

  where $\tau(t)$ is a concave function giving tax revenues as a share of earnings and $\bar{w}$ the average labor income.

- γ is the share of spending received by employed agents.
- Consumption of employed is

$$c_E(w) = (1-t)w + \gamma \frac{T(t)}{e},$$

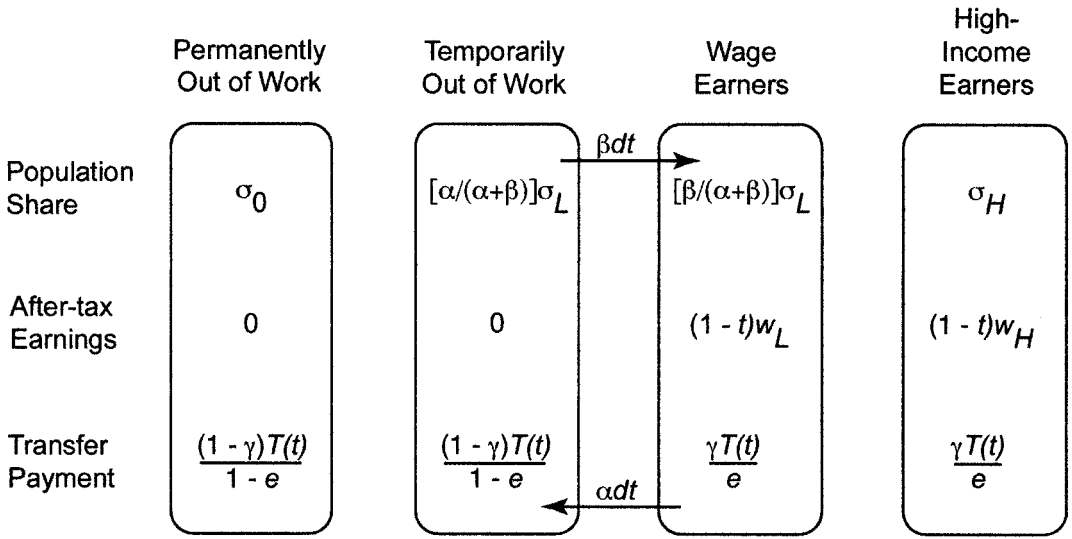
  while consumption of unemployed is

$$c_N = \frac{(1-\gamma)T(t)}{1-e}.$$

- $\gamma = 0$: targeting of benefits on unemployed. Pure insurance program.
- $\gamma = 1$: targeting of benefits on employed. Pure redistribution program.
- $\gamma = e$: universalistic benefit, mixing insurance and redistribution.

Summarized on Figure 2

FIGURE 2. The Distribution of Income



σ_0	The share of the population permanently without work
σ_L	The share of the population who are wage earners
σ_H	The share of the population who are high-income earners
αdt	The probability that employed wage earners will lose their earnings within the period *dt*
βdt	The probability that wage earners without employment will obtain employment within *dt*
$(1 - t)$	The share of earnings remaining after taxes are paid
w_L	The earnings of wage earners
w_H	The earnings of high-income earners
γ	The share of aggregate social insurance spending received by the employed
$T(t)$	Total social insurance expenditures as a function of the tax rate
e	The share of the population who are employed

4.1.3. Preferences

- Given by $u(c)$, that is
  - concave,
  - satisfies Inada conditions,
  - with $\mu = CRRA = -cu"(c)/u'(c) > 1$, so that insurance is a normal good.
- Expected lifetime utility of currently employed agent with low ability is

$$\frac{\beta + r}{\alpha + \beta + r} u(c_E(w_L)) + \frac{\alpha}{\alpha + \beta + r} u(c_N),$$

  where r is the discount rate (plus concern for the poor, if any).

4.2. Voting over t for given γ (exogenous targeting)

- Objective is to settle the contrasting predictions of the two approaches (insurance and redistribution) concerning the impact of inequality on the support for welfare benefits.
- Preferences are single-peaked, and the median voter is a low wage employed agent.
- His most-preferred value of t equalizes MRS between consumption when employed and when not and MRT (given γ):

$$\left(\frac{\beta + r}{\alpha}\right) \frac{u'(c_E)}{u'(c_N)} = \left(\frac{e}{1-e}\right) \frac{(1-\gamma)\tau'(t)}{(w_L/\bar{w}) - \gamma\tau'(t)}.$$

- Comparative static analysis:

$$\frac{dt^*}{dr} > 0, \ \frac{d\tau'(t)}{dt} > 0,$$
$$\frac{dt^*}{d\gamma} > 0, \ \frac{dc_N}{d\gamma} \gtreqless 0,$$

with $dc_N/d\gamma > 0$ if $\tau(t) \approx t$.

Proposition 1: A mean-preserving spread in the income distribution (i) reduces the median voter's preferred level of benefits when benefits are targeted to those without employment ($\gamma = 0$) but (ii) increases the median voter's preferred level of benefits when benefits are targeted to the employed ($\gamma = 1$).

- **Intuition:** Mean-preserving spread
  - (i) makes decisive voter poorer (lower w_L) so that he wants less insurance,
  - (ii) increases the gap between w_H and w_L and thus the amount of redistribution, so that the decisive voter wants more taxation.
- If $\gamma = 0$, insurance dominates and t^* decreases
- If $\gamma = 1$, redistribution dominates and t^* increases.
- The CCRA parameter μ plays a role:
  - μ close to 1 means that the redistribution effect dominates,
  - μ very large means that the insurance effect dominates.

Conclusion:

"In comparing countries with similar average income and similar distribution of the risk of income loss, support for spending on benefits targeted to the unemployed rises as the skewness of the income distribution declines."

4.3. Choosing both benefit levels and targeting

Two stages in the analysis:

- First, find optimal policy of median income group,
- Second, propose two political models with this policy as an equilibrium.

4.3.1. the optimal policy of the low wage employed agents.

- FOC for t:

$$\frac{\beta + r}{\alpha} \frac{u'(c_E)}{u'(c_N)} = \frac{e}{1-e} \frac{(1-\gamma)\tau'(t)}{(w_L/\bar{w}) - \gamma\tau'(t)}.$$

- FOC for γ:

$$\gamma \left[\frac{\beta + r}{\alpha} \frac{u'(c_E)}{u'(c_N)} - \frac{e}{1-e} \right] = 0. \tag{1}$$

- **Remark:** we always have $\gamma < 1$ since $u'(0) = \infty$: need some consumption if unemployed. From (1), two cases: $\gamma > 0$ and $\gamma = 0$.

A) If $\gamma > 0$.

- Then FOCs for t and γ become

$$\begin{aligned} \tau'(t)\bar{w} - w_L &= 0, \\ \frac{\beta + r}{\alpha}\frac{u'(c_E)}{u'(c_N)} &= \frac{e}{1-e}. \end{aligned} \tag{2}$$

- FOC t: Equalizes marginal cost and marginal benefit of taxation. We then have

$$\frac{dt^*}{dw_L} = \frac{1}{\tau''(t)\bar{w}} < 0. \tag{3}$$

- FOC γ: Equalizes MRS between consumption when employed and when not with the cost of transferring income from employed to unemployed, which is equal to the relative size of the two groups.

- If w_L decreases, to keep LHS of (2) constant we must decrease the benefit served to non employed:

$$\frac{dc_N^*}{dw_L} > 0. \tag{4}$$

- Putting (3) and (4) together, we obtain

$$\frac{d\gamma^*}{dw_L} < 0.$$

- In words, employed workers who suffer a decline in earnings prefer a partial offset of the wage reduction through an increase in the benefits targeted to themselves.

B) If $\gamma = 0$.

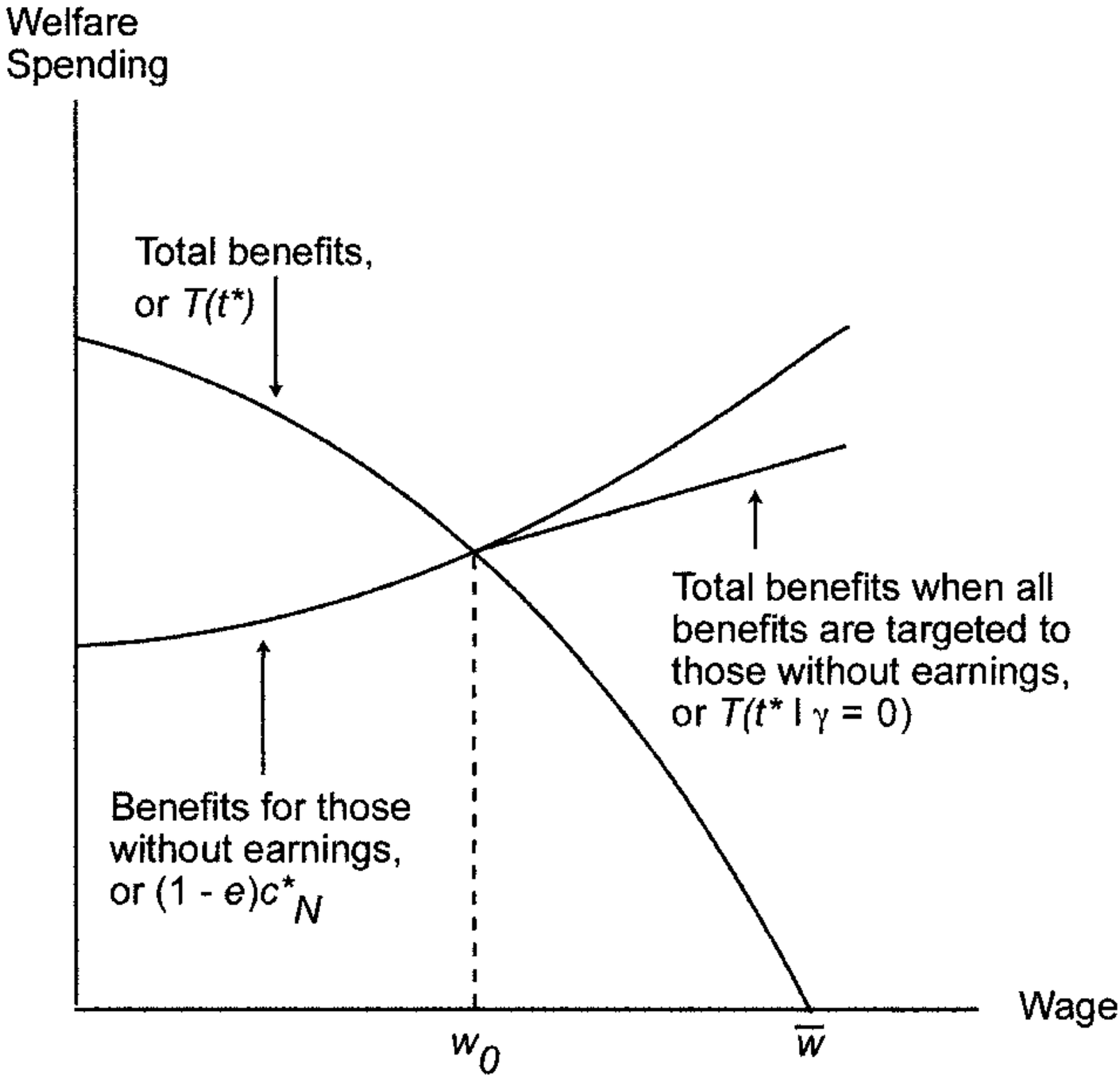
- Then, by Proposition 1, we have that

$$\frac{dt^*}{dw_L} > 0.$$

Summarized on Figure 3.

Proposition 2: A mean-preserving increase in inequality that lowers the income of the median voter (i) reduces wage earners' preferred level of benefits targeted to those with no income, (ii) reduces wage earners' preferred level of aggregate spending when initial inequality is sufficiently small, but (iii) increases wage earners' preferred level of aggregate spending when initial inequality is sufficiently large.

FIGURE 3. Preferred Policy of Employed Wage Earners



Intuition:

- If w_L low, then (i) low tax price of welfare benefits, so that want a lot of taxation ($T(t^*)$ large) and want both redistribution and insurance at optimum.
- As w_L increases: (i) tax price increases so that $T(t^*)$ decreases and (ii) demand for insurance increases (normal goods), but does not crowd out totally tax proceeds so positive remainder for redistribution ($\gamma > 0$).
- For some threshold $w_0 < \bar{w}$, demand for insurance crowds out available tax proceeds ($\gamma^* = 0$).
- From that point on, t^* increases and is driven entirely by demand for insurance.

Conclusion: t^* is V shaped with w_L.

4.3.2. Political economy model

- If $w_L > w_0$, then a majority always favor $\gamma = 0$ (all unemployed plus low wage earners) and the policy favored by low wage earners is a Condorcet winner even when voting simultaneously over γ and t.
- If $w_L < w_0$, then $\gamma^*(w_L) > 0$ and we need to prevent an alliance of the extremes (unemployed and high wage earners) that could defeat the policy $(\gamma^*(w_L), t^*(w_L))$.
- This can be done in two ways:
  - Issue-by-issue voting (Shepsle equilibrium): two choices made by two separate committees, "à la Cournot". Same agent decisive in two choices.
  - Partisan competition where parties represent exogenous constituencies, à la Roemer (2001).

4.3.3. Empirical tests

- Testable implications: both the share of GDP and of government spending that is allotted in democracies to benefits aimed at those without earnings decrease when the skewness of the (pre-tax) income distribution increases. (True whether γ is endogenous or not).
- Borne out by the empirical part of the paper.

5. General conclusion

- First two papers focus on support for targeting and find that it is not possible to sustain a program targeting less than a fraction of the population that is strictly larger than one half (3/4 in DD-H and 2/3 in M-W).
- Way out: altruism. What about uncertainty without insurance?
- Even if support for welfare program remains strong enough when targeting is introduced, the impact on the level of benefits received by the poor is ambiguous.
- Third paper asks different question, and shows that more inequality decreases the fraction of GDP/tax expenditures allotted to unemployed (insurance motive). Borne out empirically.
- Main technical difficulty is multidimensionality of choice space. Much remains to be done.