

# The political economy of targeting II: probabilistic targeting

E. Peluso

University of Verona

2017

- "So general is this tendency [to locate at the median] that it appears in the most diverse fields of competitive activity, even quite apart from what is called economic life. In politics it is strikingly exemplified.

- "So general is this tendency [to locate at the median] that it appears in the most diverse fields of competitive activity, even quite apart from what is called economic life. In politics it is strikingly exemplified.
- The competition for votes between the Republican and Democratic parties does not lead to a clear drawing of issues, an adoption of two strongly contrasted positions between which the voter may choose.

- "So general is this tendency [to locate at the median] that it appears in the most diverse fields of competitive activity, even quite apart from what is called economic life. In politics it is strikingly exemplified.
- The competition for votes between the Republican and Democratic parties does not lead to a clear drawing of issues, an adoption of two strongly contrasted positions between which the voter may choose.
- Instead, each party strives to make its platform as much like the other's as possible.

- "So general is this tendency [to locate at the median] that it appears in the most diverse fields of competitive activity, even quite apart from what is called economic life. In politics it is strikingly exemplified.
- The competition for votes between the Republican and Democratic parties does not lead to a clear drawing of issues, an adoption of two strongly contrasted positions between which the voter may choose.
- Instead, each party strives to make its platform as much like the other's as possible.
- Any radical departure would lose many votes, even though it might lead to stronger commendation of the party by some who vote for it anyhow. (Hotelling 1929, p. 55)"

# Motivation

- This presentation is based on a recent WP written with Philippe De Donder

- This presentation is based on a recent WP written with Philippe De Donder
- Amartya Sen: “the political economy of targeting has to be concerned not just with the economic problems of selection, information and incentives, but also with the political support for, and feasibility of, aiming public policy specifically at removing the deprivation of particular groups” (1995: 14).

- This presentation is based on a recent WP written with Philippe De Donder
- Amartya Sen: “the political economy of targeting has to be concerned not just with the economic problems of selection, information and incentives, but also with the political support for, and feasibility of, aiming public policy specifically at removing the deprivation of particular groups” (1995: 14).
- Social transfers targeted on the basis of income represent a sizeable component of public spending (almost 11% of public spending in OECD countries).



- This presentation is based on a recent WP written with Philippe De Donder
- Amartya Sen: “the political economy of targeting has to be concerned not just with the economic problems of selection, information and incentives, but also with the political support for, and feasibility of, aiming public policy specifically at removing the deprivation of particular groups” (1995: 14).
- Social transfers targeted on the basis of income represent a sizeable component of public spending (almost 11% of public spending in OECD countries).
- However, theoretical models predict that increased targeting towards the poor hurts them because the erosion of popular support.

- "supporters of targeting argue that targeting makes the best use of scarce resources for poverty alleviation, while most of the universal subsidies go to the “ middle class” and only a small proportion of the money reaches those who most need assistance and universalistic programs are both expensive and inefficient

- "supporters of targeting argue that targeting makes the best use of scarce resources for poverty alleviation, while most of the universal subsidies go to the " middle class" and only a small proportion of the money reaches those who most need assistance and universalistic programs are both expensive and inefficient
- "supporters of the universalism worry that the more targeted the program, the scarcer the resources for poverty alleviation become". (Moene and Wallerstein 99)

- "supporters of targeting argue that targeting makes the best use of scarce resources for poverty alleviation, while most of the universal subsidies go to the " middle class" and only a small proportion of the money reaches those who most need assistance and universalistic programs are both expensive and inefficient
- "supporters of the universalism worry that the more targeted the program, the scarcer the resources for poverty alleviation become". (Moene and Wallerstein 99)
- The previous literature identifies the extent of targeting as the central issue.

- "supporters of targeting argue that targeting makes the best use of scarce resources for poverty alleviation, while most of the universal subsidies go to the " middle class" and only a small proportion of the money reaches those who most need assistance and universalistic programs are both expensive and inefficient
- "supporters of the universalism worry that the more targeted the program, the scarcer the resources for poverty alleviation become". (Moene and Wallerstein 99)
- The previous literature identifies the extent of targeting as the central issue.
- An extreme consequence of this approach is that too much targeting results in the absence of majority support for the program

- Voting equilibrium of the degree of targeting and the level of taxation when labour supply is variable.

- Voting equilibrium of the degree of targeting and the level of taxation when labour supply is variable.
- Alesina and Weil (1992): the government can improve upon a linear income tax schedule (i.e., universal benefit) by reducing both the tax rate and lower lump-sum transfers: the high types would accept less transfers in exchange for a lower marginal tax rate.

- Voting equilibrium of the degree of targeting and the level of taxation when labour supply is variable.
- Alesina and Weil (1992): the government can improve upon a linear income tax schedule (i.e., universal benefit) by reducing both the tax rate and lower lump-sum transfers: the high types would accept less transfers in exchange for a lower marginal tax rate.
- High incomes taxed at a lower rate induce greater labour supply from the most productive individuals, and the increased tax revenue can be either redistributed in a lump-sum manner or used to reduce the tax burden on the least productive individuals, achieving a Pareto improvement, as for Seade (1977)'s no-distortion-at-the-top result.



- De Donder and Hindriks (1998) fix the level of targeting and analyse the vote on  $t$ .

- De Donder and Hindriks (1998) fix the level of targeting and analyse the vote on  $t$ .
- They show that increased targeting is not detrimental to the poor up to a critical level above which redistribution lacks political support.

- De Donder and Hindriks (1998) fix the level of targeting and analyse the vote on  $t$ .
- They show that increased targeting is not detrimental to the poor up to a critical level above which redistribution lacks political support.
- the benefit needs to be targeted towards significantly more than one half of the voting population to be supported by a majority of voters

## Voting on both dimensions:

- They also study possible coalitions among different groups of voters, when both targeting and tax rates are endogenous.

## Voting on both dimensions:

- They also study possible coalitions among different groups of voters, when both targeting and tax rates are endogenous.
- It is not possible to find a majority coalition of the extremes that would reject the middle in exchange of lower taxation

## Voting on both dimensions:

- They also study possible coalitions among different groups of voters, when both targeting and tax rates are endogenous.
- It is not possible to find a majority coalition of the extremes that would reject the middle in exchange of lower taxation
- The poor can form alternative coalitions with the rich and the middle to raise respectively targeting and taxation to their most preferred levels.

- Moene and Wallerstein (2001)

## Other results with fixed targeting

- Moene and Wallerstein (2001)
- insurance motive for the transfer but similar result:



## Other results with fixed targeting

- Moene and Wallerstein (2001)
- insurance motive for the transfer but similar result:
- no political support for a targeted system when less than two-thirds of the population receive the transfer.

## Other results with fixed targeting

- Moene and Wallerstein (2001)
- insurance motive for the transfer but similar result:
- no political support for a targeted system when less than two-thirds of the population receive the transfer.
- Gelbach and Pritchett 2002 “More for the poor means less for the poor”

## Other results with fixed targeting

- Moene and Wallerstein (2001)
- insurance motive for the transfer but similar result:
- no political support for a targeted system when less than two-thirds of the population receive the transfer.
- Gelbach and Pritchett 2002 “More for the poor means less for the poor”
- Compared to uniform transfers, a targeted regime is less generous to the poor.

# Tackling the paradoxes

- Minority targeting and majority voting can be reconciled, if agents see the attribution of the benefit as a random process.

# Tackling the paradoxes

- Minority targeting and majority voting can be reconciled, if agents see the attribution of the benefit as a random process.
- We take a political economy perspective to explain:

# Tackling the paradoxes

- Minority targeting and majority voting can be reconciled, if agents see the attribution of the benefit as a random process.
- We take a political economy perspective to explain:
- 1) **The majoritarian support** for targeted policies, **however small the minority** targeted.

# Tackling the paradoxes

- Minority targeting and majority voting can be reconciled, if agents see the attribution of the benefit as a random process.
- We take a political economy perspective to explain:
- 1) **The majoritarian support** for targeted policies, **however small the minority** targeted.
- 2) The link between the **degree of targeting** and the **size** of the anti-poverty program.

- Our strategy to reconcile targeting and majority voting assumes a **random attribution of the benefit**



- Our strategy to reconcile targeting and majority voting assumes a **random attribution of the benefit**
- Even purely means-tested programs make errors (of inclusion and of exclusion) that add a random component to the attribution process (Cornia and Stewart (1995), Swaminathan and Misra (2001))

- Our strategy to reconcile targeting and majority voting assumes a **random attribution of the benefit**
- Even purely means-tested programs make errors (of inclusion and of exclusion) that add a random component to the attribution process (Cornia and Stewart (1995), Swaminathan and Misra (2001))
- More generally, attribution procedures are often complex and based on several criteria beyond income.

- Our strategy to reconcile targeting and majority voting assumes a **random attribution of the benefit**
- Even purely means-tested programs make errors (of inclusion and of exclusion) that add a random component to the attribution process (Cornia and Stewart (1995), Swaminathan and Misra (2001))
- More generally, attribution procedures are often complex and based on several criteria beyond income.
- If the way these criteria are weighted is unclear, or if agents do not know the joint distribution of these criteria in the population, the attribution process can be seen as a random event.

# The basic concepts

- A continuum of agents differing in exogenous income  $y$ , distributed over  $[0, y_{\max}]$  according to cdf  $F$ , with  $y_{med} < \mu = E(y)$ .

# The basic concepts

- A continuum of agents differing in exogenous income  $y$ , distributed over  $[0, y_{\max}]$  according to cdf  $F$ , with  $y_{\text{med}} < \mu = E(y)$ .
- A fixed share  $\alpha$  of the population receives the transfer/good, financed by a proportional tax  $t$ .

# The basic concepts

- A continuum of agents differing in exogenous income  $y$ , distributed over  $[0, y_{\max}]$  according to cdf  $F$ , with  $y_{med} < \mu = E(y)$ .
- A fixed share  $\alpha$  of the population receives the transfer/good, financed by a proportional tax  $t$ .
- The probability of receiving a transfer is a continuous function  $p(y, \alpha) \in [0, 1]$  depending on income  $y$  and on  $\alpha$ .

# The basic concepts

- A continuum of agents differing in exogenous income  $y$ , distributed over  $[0, y_{\max}]$  according to cdf  $F$ , with  $y_{\text{med}} < \mu = E(y)$ .
- A fixed share  $\alpha$  of the population receives the transfer/good, financed by a proportional tax  $t$ .
- The probability of receiving a transfer is a continuous function  $p(y, \alpha) \in [0, 1]$  depending on income  $y$  and on  $\alpha$ .
- We further assume

$$\int_0^{y_{\max}} p(y, \alpha) dF(y) = \alpha.$$

# The voter preferences

- All individuals have the same preferences represented by an increasing and concave function  $u(\cdot)$  of consumption.



# The voter preferences

- All individuals have the same preferences represented by an increasing and concave function  $u(\cdot)$  of consumption.
- They all pay a proportional tax  $t$  on their income that is used to finance the transfer received with probability  $p(y, \alpha)$ . Their indirect utility function is:

$$U(y; t, \alpha) = (1 - p)u(c_u) + pu(c_l),$$

with

$$c_u = (1 - t)y$$

$$c_l = (1 - t)y + \frac{t\mu}{\alpha}$$

# The voter preferences

- All individuals have the same preferences represented by an increasing and concave function  $u(\cdot)$  of consumption.
- They all pay a proportional tax  $t$  on their income that is used to finance the transfer received with probability  $p(y, \alpha)$ . Their indirect utility function is:

$$U(y; t, \alpha) = (1 - p)u(c_u) + pu(c_l),$$

with

$$c_u = (1 - t)y$$

$$c_l = (1 - t)y + \frac{t\mu}{\alpha}$$

- The individual benefit of "lucky" people is equal to  $\frac{t\mu}{\alpha}$

- We look for the individuals' most-preferred value of  $t$  for a given exogenous value of  $\alpha$

$$U(y; t, \alpha) = (1 - p)u((1 - t)y) + pu((1 - t)y + \frac{t\mu}{\alpha})$$

- We look for the individuals' most-preferred value of  $t$  for a given exogenous value of  $\alpha$

$$U(y; t, \alpha) = (1 - p)u((1 - t)y) + pu((1 - t)y + \frac{t\mu}{\alpha})$$

- The FOC with respect to  $t$  is

$$\frac{\partial U(y; t, \alpha)}{\partial t} = pu'(c_l) \left[ \frac{\mu}{\alpha} - y \right] - (1 - p)u'(c_u)y.$$

- We look for the individuals' most-preferred value of  $t$  for a given exogenous value of  $\alpha$

$$U(y; t, \alpha) = (1 - p)u((1 - t)y) + pu((1 - t)y + \frac{t\mu}{\alpha})$$

- The FOC with respect to  $t$  is

$$\frac{\partial U(y; t, \alpha)}{\partial t} = pu'(c_l) \left[ \frac{\mu}{\alpha} - y \right] - (1 - p)u'(c_u)y.$$

- The SOC is satisfied, so that a Condorcet winner exists:  
 $t^V = med(t^*(y))$ . It may differ from  $t^*(y_{med})$ .

- We look for the individuals' most-preferred value of  $t$  for a given exogenous value of  $\alpha$

$$U(y; t, \alpha) = (1 - p)u((1 - t)y) + pu((1 - t)y + \frac{t\mu}{\alpha})$$

- The FOC with respect to  $t$  is

$$\frac{\partial U(y; t, \alpha)}{\partial t} = pu'(c_l) \left[ \frac{\mu}{\alpha} - y \right] - (1 - p)u'(c_u)y.$$

- The SOC is satisfied, so that a Condorcet winner exists:  $t^V = med(t^*(y))$ . It may differ from  $t^*(y_{med})$ .
- Then  $t^V > 0$  if and only if, for a majority of citizens:

$$\frac{\partial U(y; t, \alpha)}{\partial t} \Big|_{t=0} > 0$$

- This is equivalent to

$$\frac{p(y, \alpha)}{\alpha} > \frac{y}{\mu} \quad (1)$$

for a majority of citizens.

- This is equivalent to

$$\frac{p(y, \alpha)}{\alpha} > \frac{y}{\mu} \quad (1)$$

for a majority of citizens.

- This intuitive condition;



- This is equivalent to

$$\frac{p(y, \alpha)}{\alpha} > \frac{y}{\mu} \quad (1)$$

for a majority of citizens.

- This intuitive condition;
- does not depend on  $u(\cdot)$ , but only on  $p$ ;

- This is equivalent to

$$\frac{p(y, \alpha)}{\alpha} > \frac{y}{\mu} \quad (1)$$

for a majority of citizens.

- This intuitive condition;
- does not depend on  $u(\cdot)$ , but only on  $p$ ;
- is compatible with even rich individuals supporting  $t > 0$ .

- From now on, assume that  $p(y, \alpha)$  is decreasing in income.

- From now on, assume that  $p(y, \alpha)$  is decreasing in income.
- Then, we only have to check that

$$\frac{p(y_{med}, \alpha)}{\alpha} > \frac{y_{med}}{\mu} \quad (2)$$

- From now on, assume that  $p(y, \alpha)$  is decreasing in income.
- Then, we only have to check that

$$\frac{p(y_{med}, \alpha)}{\alpha} > \frac{y_{med}}{\mu} \quad (2)$$

- Note that this does **not** imply that  $y_{med}$  is the decisive voter.

- **Assumption 1:**  $p(y, \alpha)$  is concave in  $y$ .

- **Assumption 1:**  $p(y, \alpha)$  is concave in  $y$ .

**Proposition 1** *Assumption 1 is a sufficient (but not necessary) condition for  $t^V > 0$ .*

- **Assumption 1:**  $p(y, \alpha)$  is concave in  $y$ .

**Proposition 1** *Assumption 1 is a sufficient (but not necessary) condition for  $t^V > 0$ .*

- **Proof:** By Jensen's inequality,  $p(y_{med}, \alpha) > p(\mu, \alpha) \geq \alpha$ , so that

$$\frac{p(y_{med}, \alpha)}{\alpha} > 1 > \frac{y_{med}}{\mu}$$



- **Assumption 1:**  $p(y, \alpha)$  is concave in  $y$ .

**Proposition 1** *Assumption 1 is a sufficient (but not necessary) condition for  $t^V > 0$ .*

- **Proof:** By Jensen's inequality,  $p(y_{med}, \alpha) > p(\mu, \alpha) \geq \alpha$ , so that

$$\frac{p(y_{med}, \alpha)}{\alpha} > 1 > \frac{y_{med}}{\mu}$$

- **Remark:** This result is valid whatever the value of  $\alpha > 0$  and for any concave utility function.

- We assume for the moment that  $y_{med}$  is decisive and we study the consequences of more targeting.

## Proposition

- We assume for the moment that  $y_{med}$  is decisive and we study the consequences of more targeting.
- A decrease in  $\alpha$  reduces the probability to receive the transfer, while increasing its value (for a given tax rate).

## Proposition

- We assume for the moment that  $y_{med}$  is decisive and we study the consequences of more targeting.
- A decrease in  $\alpha$  reduces the probability to receive the transfer, while increasing its value (for a given tax rate).
- **Assumption 2** *The elasticity of the probability of receiving the transfer to  $\alpha$  is at least equal to 1 for the median income individual:*

$$\frac{\partial p(y_{med}, \alpha)}{\partial \alpha} \geq \frac{p(y_{med}, \alpha)}{\alpha}.$$

## Proposition

- We assume for the moment that  $y_{med}$  is decisive and we study the consequences of more targeting.
- A decrease in  $\alpha$  reduces the probability to receive the transfer, while increasing its value (for a given tax rate).
- **Assumption 2** *The elasticity of the probability of receiving the transfer to  $\alpha$  is at least equal to 1 for the median income individual:*

$$\frac{\partial p(y_{med}, \alpha)}{\partial \alpha} \geq \frac{p(y_{med}, \alpha)}{\alpha}.$$

## Proposition

- **Proposition 2** *If  $y_{med}$  is decisive and Assumption 2 holds, a lower exogenous  $\alpha$  gives a lower majority voting equilibrium program size:*

$$\frac{\partial t^V}{\partial \alpha} > 0.$$

- **Assumption 3** *The coefficient of relative risk aversion is lower than one:*

$$-\frac{xu''(x)}{u'(x)} < 1.$$

## Proposition

- **Assumption 3** *The coefficient of relative risk aversion is lower than one:*

$$-\frac{xu''(x)}{u'(x)} < 1.$$

## Proposition

- *Assumption 3 is a sufficient (but not necessary) condition for  $y_{med}$  to be decisive..*

- **Assumption 3** *The coefficient of relative risk aversion is lower than one:*

$$-\frac{xu''(x)}{u'(x)} < 1.$$

## Proposition

- *Assumption 3 is a sufficient (but not necessary) condition for  $y_{med}$  to be decisive..*
- This assumption implies that  $t^*(y)$  is monotone decreasing in  $y$ .



# Social housing in France

- In 2011, 5.192 million out of the 28.2 million (main) residences in France consisted of social housing. This represents 44% of the rental market, and slightly below 20% of the total housing market for main residences.

# Social housing in France

- In 2011, 5.192 million out of the 28.2 million (main) residences in France consisted of social housing. This represents 44% of the rental market, and slightly below 20% of the total housing market for main residences.
- Social housing represents the equivalent of a transfer (the gap between market and actual rent) varying from 500€ to 1,500€ per household per year and the demand for social housing exceeds supply, ( 64% of the French population qualifies for access to social housing (Trannoy and Wasmer 2013)..

# Social housing in France

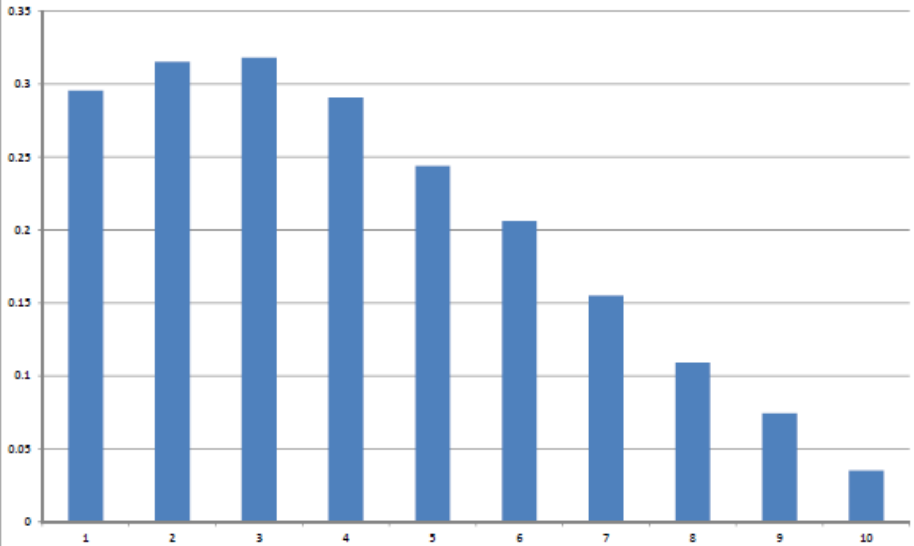
- In 2011, 5.192 million out of the 28.2 million (main) residences in France consisted of social housing. This represents 44% of the rental market, and slightly below 20% of the total housing market for main residences.
- Social housing represents the equivalent of a transfer (the gap between market and actual rent) varying from 500€ to 1,500€ per household per year and the demand for social housing exceeds supply, ( 64% of the French population qualifies for access to social housing (Trannoy and Wasmer 2013)..
- Demand for social housing exceeds supply, and there is uncertainty as to whether a candidate will obtain social housing (within a reasonable delay), so that the access to social housing can be seen as a probabilistic event. |

- We use the 2006 “Enquête Logement” by INSEE. Contains extensive information on a French representative sample of 42,694 households, including whether they occupy subsidized social housing (“Habitation à Loyer Modéré”, or HLM) and the total yearly income of the household.

- We use the 2006 “Enquête Logement” by INSEE. Contains extensive information on a French representative sample of 42,694 households, including whether they occupy subsidized social housing (“Habitation à Loyer Modéré”, or HLM) and the total yearly income of the household.
- 8,780 out of the 42,694 households do occupy a HLM in the 2006 database, which means that  $\alpha = 0.206$ .

- We use the 2006 “Enquête Logement” by INSEE. Contains extensive information on a French representative sample of 42,694 households, including whether they occupy subsidized social housing (“Habitation à Loyer Modéré”, or HLM) and the total yearly income of the household.
- 8,780 out of the 42,694 households do occupy a HLM in the 2006 database, which means that  $\alpha = 0.206$ .
- We construct the probability of obtaining social housing as a function of income by computing, for each income decile, the proportion of households in this decile who currently benefit from social housing.

**Figure 1: Proportion of social housing  
by income decile**



**Figure 1: Proportion of social housing  
by income decile**

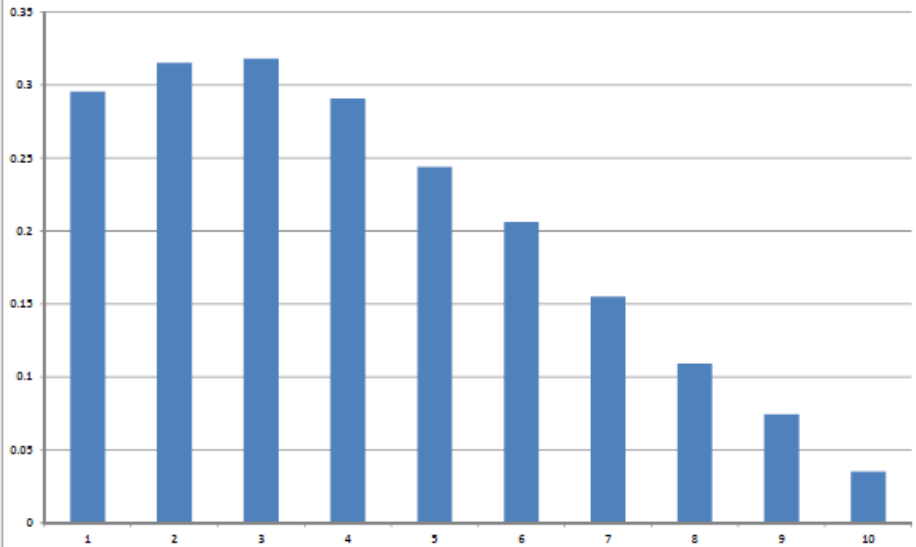
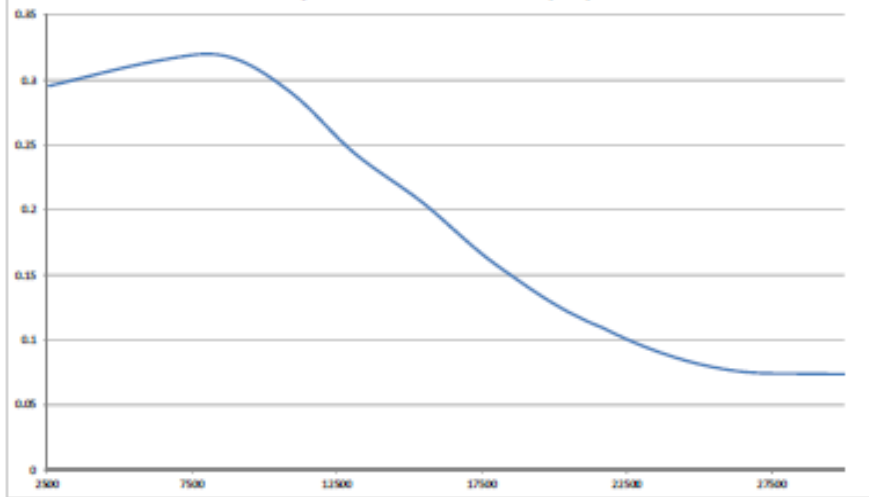




Figure 2: Proportion of social housing by household annual income (in €)



- Recall that  $t^V > 0$  iff

$$\frac{p(y, \alpha)}{y} > \frac{\alpha}{\mu}$$

for a majority of voters.

- Recall that  $t^V > 0$  iff

$$\frac{p(y, \alpha)}{y} > \frac{\alpha}{\mu}$$

for a majority of voters.

- We obtain that the LHS is monotone decreasing in  $y$  and equals  $\alpha/\mu$  at the 57.7 percentile of the income distribution.

- Recall that  $t^V > 0$  iff

$$\frac{p(y, \alpha)}{y} > \frac{\alpha}{\mu}$$

for a majority of voters.

- We obtain that the LHS is monotone decreasing in  $y$  and equals  $\alpha/\mu$  at the 57.7 percentile of the income distribution.
- We have  $F(\mu) = 0.61$ : the average income voter should be against the public housing scheme. distribution

# Conclusive Remarks

- Minority targeting can be supported by a majority of voters, however small the minority targeted.

# Conclusive Remarks

- Minority targeting can be supported by a majority of voters, however small the minority targeted.
- Condition for  $t^V > 0$  satisfied in the case of social housing in France in 2006, with  $\alpha = 0.2$ .

# Conclusive Remarks

- Minority targeting can be supported by a majority of voters, however small the minority targeted.
- Condition for  $t^V > 0$  satisfied in the case of social housing in France in 2006, with  $\alpha = 0.2$ .
- $p$  decreasing in income  $\Rightarrow$  should focus on  $y_{med}$  (even if not decisive)

# Conclusive Remarks

- Minority targeting can be supported by a majority of voters, however small the minority targeted.
- Condition for  $t^V > 0$  satisfied in the case of social housing in France in 2006, with  $\alpha = 0.2$ .
- $p$  decreasing in income  $\Rightarrow$  should focus on  $y_{med}$  (even if not decisive)
- $p$  concave in income  $\Rightarrow t^V > 0$ .



# Conclusive Remarks

- Minority targeting can be supported by a majority of voters, however small the minority targeted.
- Condition for  $t^V > 0$  satisfied in the case of social housing in France in 2006, with  $\alpha = 0.2$ .
- $p$  decreasing in income  $\Rightarrow$  should focus on  $y_{med}$  (even if not decisive)
- $p$  concave in income  $\Rightarrow t^V > 0$ .
- Making the probability that the median income voter receives the transfer sufficiently responsive to the fraction of the population targeted induces her to favor a smaller system when targeting is increased.