Preferences for Redistribution in the Presence of Income Sorting

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Preferences over redistribution:

-Below (above) the mean vote for (against) redistribution (Meltzer and Richards).

-Other dimensions (Roemer, Alesina and La Ferrara..)

-Mobility or dynamics (Benabou and Ok, Hassler et al..)

-Different beliefs about determinants of income (Piketty, Benabou and Tirole)

-Preferences over the income distribution (Fairness or as in Galor and Zeira)

Income complementarities create incentives for costly assortative matching.

(School or residential choices, conspicuous consumption)

Inequality affects these incentives.

Costly sorting: can match with the rich, but have to pay a price.

With equality, match with the average type, but costlessly.

Results

Characterize income distributions for which *for all assortative sorting*, even “rich” agents (above the mean) will vote for redistribution.

This arises when the income distribution is sufficiently equal.

Show when “poor” agents (below the mean) vote for no redistribution, which arises when the income distribution is sufficiently unequal.

“Ends against middle” coalition to make sorting more exclusive.

Income is distributed $F(x)$, average income μ.

Matching and income complementarities:

$$u(y, b) = yE(x|x \text{ pays } b) - b$$

Consider one “club”: all individuals with income above x pay $b(x)$.

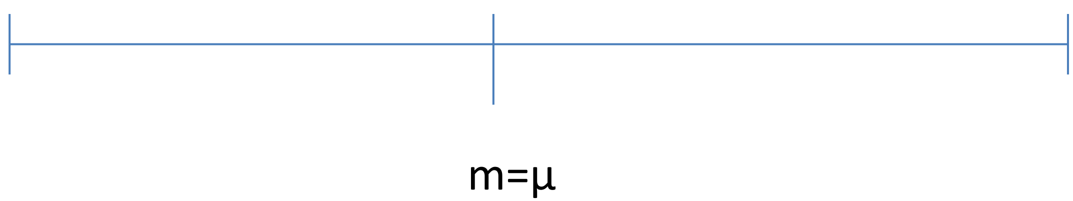
Incentive compatibility implies,

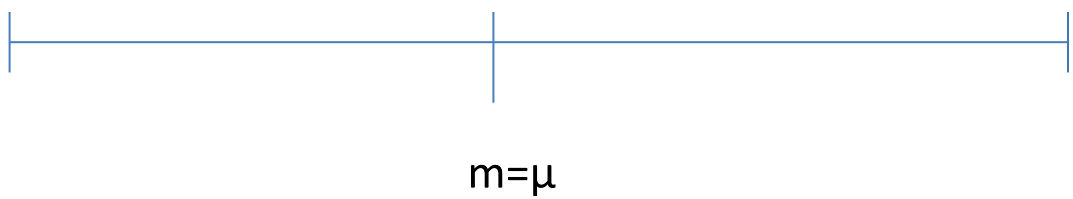
$$b(x) = x(\bar{E}_x - \underline{E}_x)$$

The utility of those in the club,

$$y\bar{E}_x - x(\bar{E}_x - \underline{E}_x)$$

With full redistribution: utility is μ^2.


m=μ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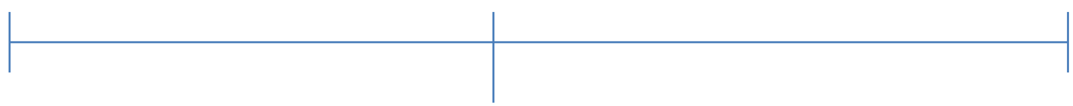
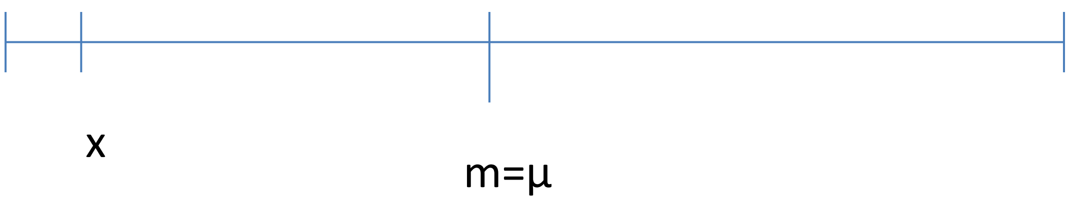
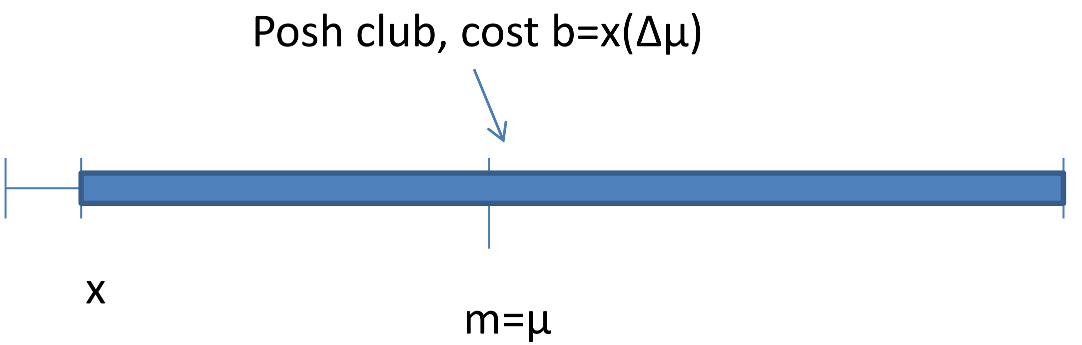
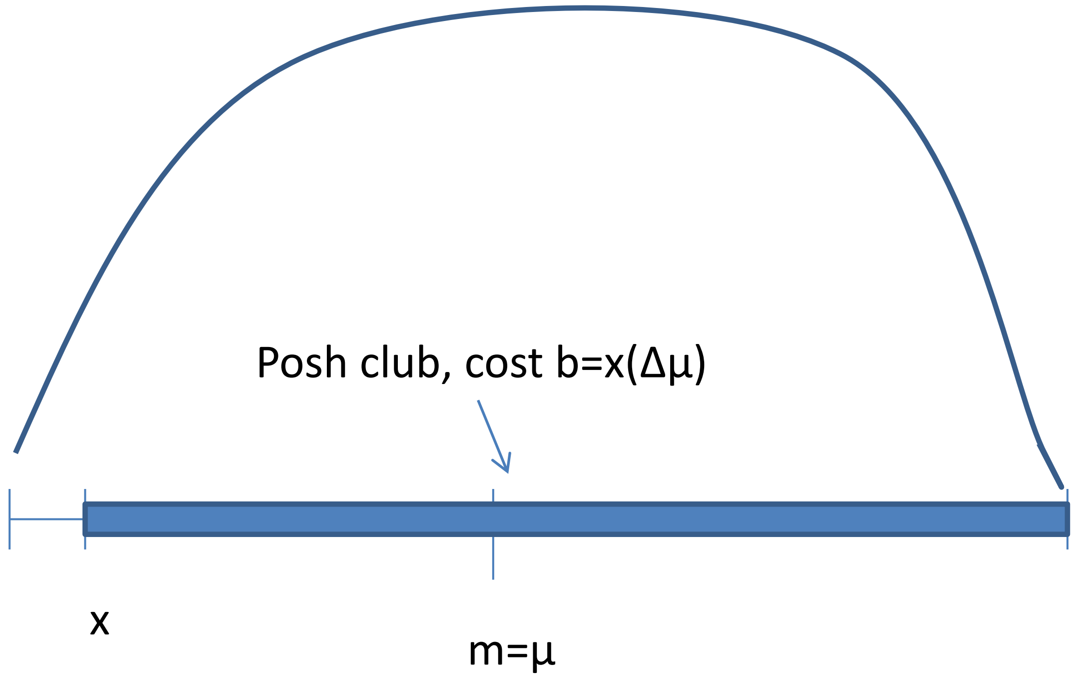
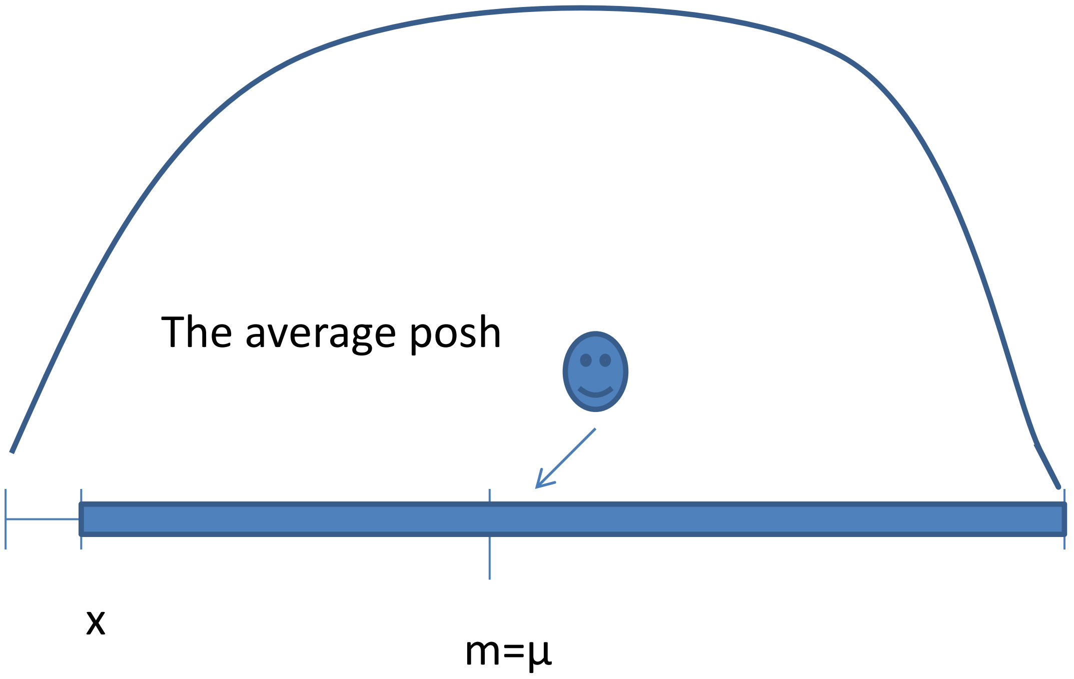


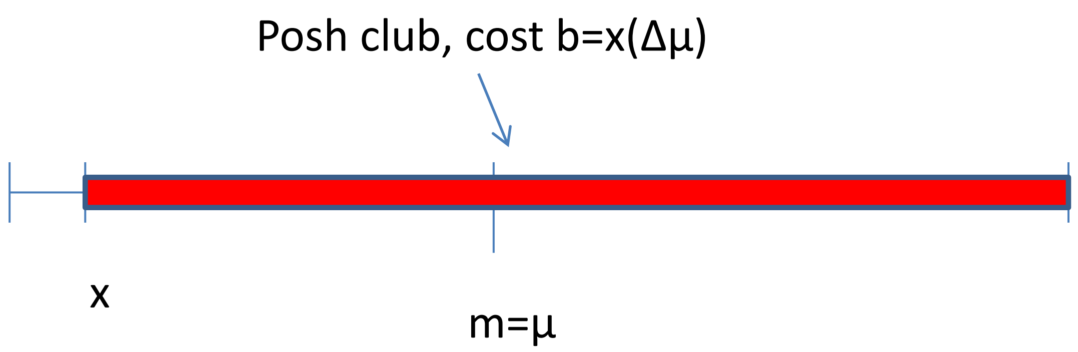
$m=\mu$


x
m=μ

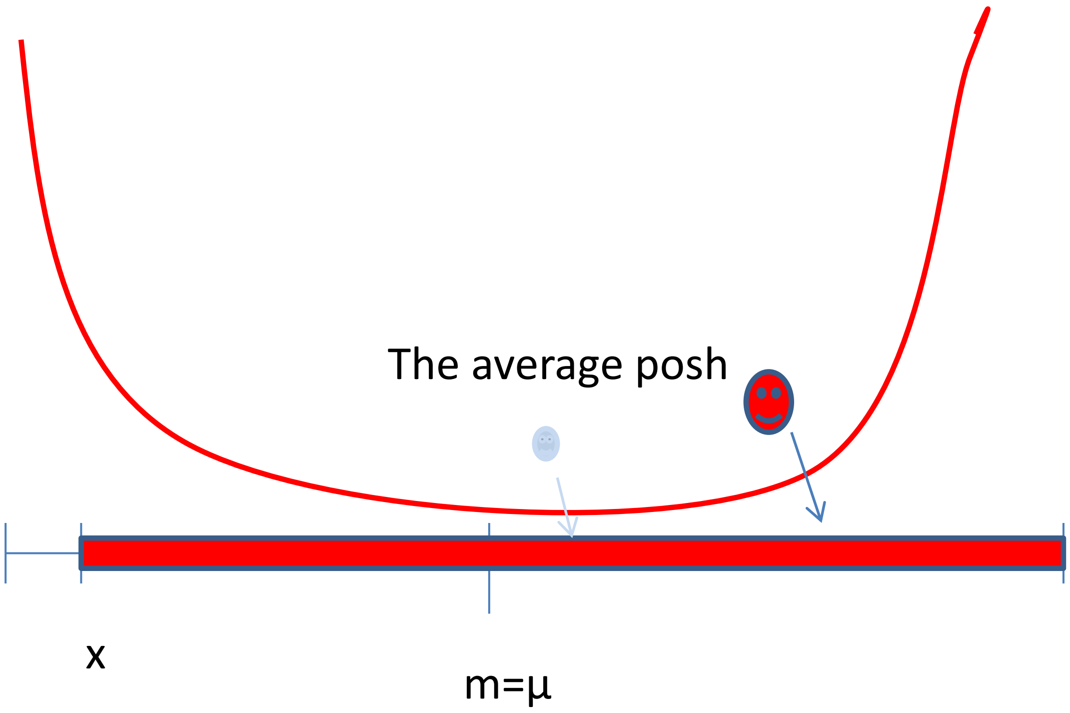

Posh club, cost b=x(Δμ)
x
m=μ


Posh club, cost b=x(Δμ)
x
m=μ


The average posh
x
m=μ



Posh club, cost b=x(Δμ)
x
m=μ

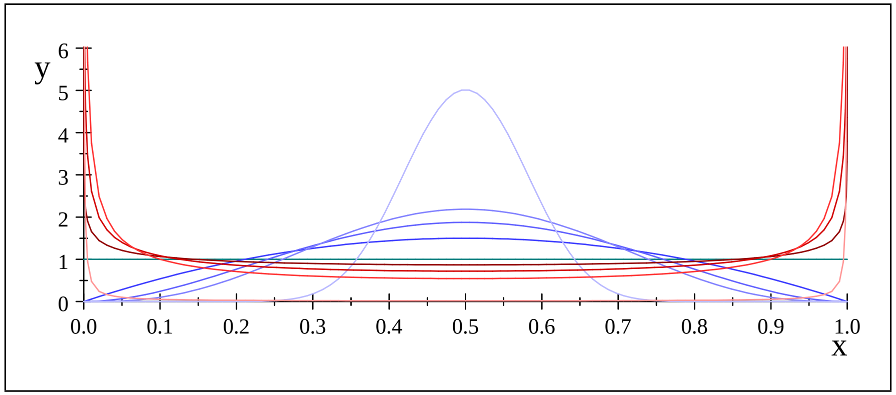


The average posh
x
m=μ

Example: Inequality and sorting

Symmetric beta distributions (with $\alpha = \beta$).

$$f(x) = \frac{x^{\alpha-1}(1-x)^{\beta-1}}{\int_0^1 u^{\alpha-1}(1-u)^{\beta-1}du}$$



The Gini coefficient is monotonically decreasing in α.

When $\alpha > 1$ (Blue): for all x, the mean and some above prefer full equality.

The higher is α, more rich agents prefer full equality.

When $\alpha < 1$ (red): there exists some x for which the median and some below prefer sorting.

The Model

Income is distributed $F(x)$, average income μ, median m.

Redistribution $(t, T = t\mu)$: $x^t = (1 - t)x + t\mu$

Matching and income complementarities:

$$u(x, b) = x^t E(y^t | y \text{ pays } b) - b$$

Incentive constraints:

Definition 1: *A feasible signal partition (FSP) is a vector* $\mathbf{x} = (x_0, x_1, ...x_{n-1}, x_n)$ *with* $x_0 = 0$ *and* $x_n = 1$ *and* $x_i \le x_{i+1}$, *such that all agents with type* $x \in [x_i, x_{i+1}]$ *for* $i = 0, 1, ..., n-1$ *pay* b_i *and are matched randomly with agents in* $[x_i, x_{i+1}]$ *only, with*

$$
\begin{aligned}
b_0 &= 0 \\
b_i - b_{i-1} &= x_i^t(E[x_j^t | x_j \in [x_i, x_{i+1}]] - E[x_j^t | x_j \in [x_{i-1}, x_i]]).
\end{aligned}
$$

Suppose just one signal with a cost b, such that all agents above x pay b :

$$b^t(x) = x^t(\bar{E}_x^t - \underline{E}_x^t)$$

Utility of x_i below x :

$$x_i \underline{E}_x$$

Utility above x :

$$\begin{aligned} & x_i^t \bar{E}_x^t - b^t(x) \\ = \ & (x_i^t - x^t)\bar{E}_x^t + x^t \underline{E}_x^t \\ = \ & (x_i - x)(1-t)\bar{E}_x^t + x^t \underline{E}_x^t \end{aligned}$$

Analysis

First order condition of $(x_i - x)(1-t)\bar{E}_x^t + x^t \underline{E}_x^t$ w.r.t. t :

$$(x_i - x)(-\bar{E}_x^t + (1-t)(\mu - \bar{E}_x)) + (\mu - x)\underline{E}_x^t + x^t(\mu - \underline{E}_x^t)$$

Second derivative:

$$2(x_i - x)(\bar{E}_x - \mu) + 2(\mu - x)(\mu - \underline{E}_x) > 0$$

Lemma 1: *For any FSP vector* $\mathbf{x}$, *for all agents* $x \leq \mu$, *preferences are U-shaped, i.e., the optimal tax level is either* $t = 0$ *or* $t = 1$.

Lemma 2: *Fix an FSP, and suppose that at some* t, *an agent* x *wants to reduce taxation. Thus all* $x' > x$ *want to reduce taxation as well.*

Proposition 1: *In any two-way political competition, the median is the decisive voter and society will choose either t=0 or t=1.*

Proposition 2 (inequality and redistribution: a local result): *When t is sufficiently high, a majority will vote to increase taxation. For some FSP's, when t is sufficiently low, a majority will vote to decrease taxation.*

Compare between $t = 0$ and $t = 1$.

Caveats:

Linear taxation

Tax distortion

Tax on b.

Focus on redistribution motives due to sorting:

How does μ compare between $t = 0$ and $t = 1$?

Assume only one club, a cutoff x.

With sorting: μ prefers $t = 1$ if $x > \mu$.

For all $x < \mu$, prefer $t = 1$ iff

$$\begin{aligned}(\mu - x)\bar{E} + x\underline{E}_x &\leq \mu^2 \Leftrightarrow \\ (1 - \frac{x}{\mu})\bar{E}_x + \frac{x}{\mu}\underline{E}_x &\leq \mu = (1 - F(x))\bar{E}_x + F(x)\underline{E}_x\end{aligned}$$

$$\frac{x}{\mu} \geq F(x) \text{ for all } x \leq \mu \qquad \text{(Condition 1)}$$

Proposition 3 (inequality and redistribution: only sorting motives, a global result)

$$\frac{x}{\mu} \geq F(x) \text{ for all } x \leq \mu \Leftrightarrow \begin{array}{c} \text{For all } \mathbf{x} \text{ and } t \\ y \in [0, \mu] \text{ supports } t = 1 \end{array}$$

Proof: Assume condition 1 and use an induction.

Suppose two cutoffs, x_1 and x_2.

Suppose $\mu > x_2$:

$$x_1 E_1 + (x_2 - x_1)E_1^2 + (\mu - x_2)E^2 \leq \mu^2 \Leftrightarrow$$

$$\frac{x_1}{\mu}E_1 + (\frac{x_2}{\mu} - \frac{x_1}{\mu})E_1^2 + (1 - \frac{x_2}{\mu})E^2 =$$

$$\frac{x_1}{\mu}(E_1 - E_1^2) + \frac{x_2}{\mu}(E_1^2 - E^2) + E^2 \leq$$

$$F(x_1)(E_1 - E_1^2) + F(x_2)(E_1^2 - E^2) + E^2 =$$

$$F(x_1)E_1 + (F(x_2) - F(x_1))E_1^2 + (1 - F(x_2))E^2 = \mu$$

Condition 1 if satisfied implies that the relatively rich might have incentives to vote left.

The condition is more likely to hold when income distribution becomes more equal.

Dynamics?

$F(x)$ has IFR (DFR) if $\frac{f(x)}{1-F(x)}$ is increasing (decreasing)

Proposition 4: Condition 1 is satisfied by all IFR distribution functions.

Exponential, Uniform, Normal, Weibull and Gamma (for shape parameters greater than 1).

“Real” income distributions and IFR/DFR:

Salem and Mount (1974) have advocated a version of the Gamma distribution, which is IFR.

Other distributions... Pareto (which is DFR) and the Lognormal (which is first IFR and then DFR).

Singh and Madala (1976) claim that income distributions should be DFR at least for high enough income.

Sorting + income motives for redistribution

Look now at the median where $m < \mu$.

Proposition 5 (inequality and redistribution: sorting and income motives, a global result): *Sufficient condition for the median to prefer t=1 to t=0 are: (i) m<0.5*μ; *(ii) x** $> m$, *where* x^* *satisfies* $\bar{E}_{x^*} = \mu\frac{\mu}{m}$; *(iii)* $\frac{x}{m} > F(x)$ *for all x.*

For the median: *too equal* or *too unequal* will lead to preferences for redistribution.

DFR distributions:

$m \leq (\ln 2)\mu \approx 0.69\mu$

Pareto distribution: $x^* > m$

IFR then DFR:

Lognormal distribution: if σ is not too high (i.e., if F is not too concave), then $\frac{x}{m} > F(x)$ is satisfied.

Preferences over sorting

Suppose one club, cutoff is x.

Proposition 6: *A coalition to increase x will always consist of those not in the club, and possibly the richest; moreover, there exist distributions for which an "ends against the middle" coalition can successfully increase x.*

Example 4: Uniform distribution over $[0,1]$ and some tax level t. For all $x' \geq 1 - 0.5\frac{t}{1-t}x$, an increase in x increases utility. When $t = 0.5$, whenever $x \geq \frac{1}{3}$, a coalition of all those below x and all those above $1 - 0.5x$ will increase x.

Example 5: Consider the Gamma distribution as in Salem and Mount (1974) with $\alpha = 2$ and $\lambda = 0.03$: The median is approximately 55. When $x = 40$, all types with income above 96 have positive utility from an increase in x, and similarly all types below 40, whereas the share of this coalition is greater than a half.

Example 6: Exponential distribution with $\lambda = 2$ where $x^m = 0.346$ and the mean is 0.5; For $x = 0.25$, all types above 0.78 and all types below 0.25, which consists a share of 60%, would rather increase x.

Conclusion

We add to the literature about preferences over redistribution.

Our explanation:

- Induces endogenous preferences over the distribution of income, as

- The distribution of income induces a sorting equilibrium with its costs and benefits, that may vary with taxation.

Conclusion

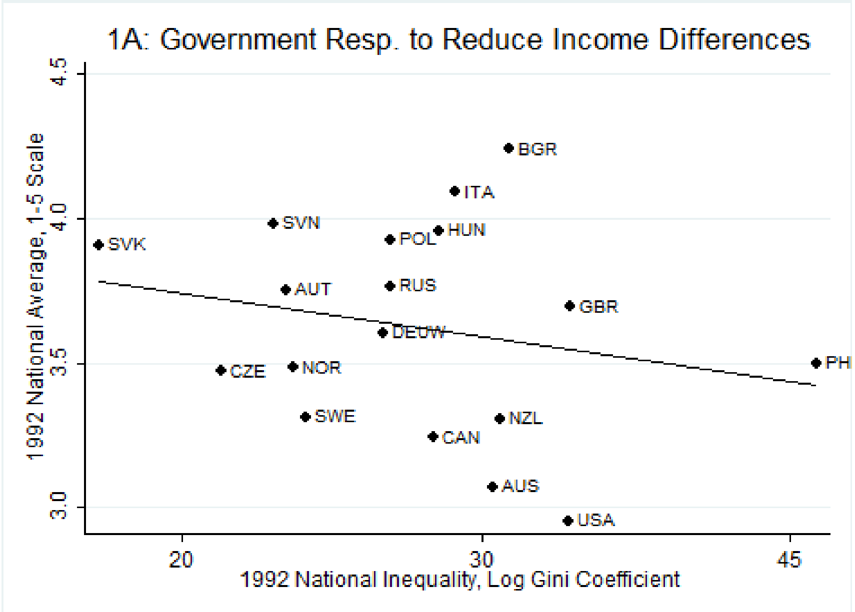
- How relatively rich can vote left and the poor can vote right.

- The relation between inequality and preferences over redistribution.

- Pure sorting motives imply that equal societies would push for more redistribution and unequal societies may push for less redistribution.

- US-Europe, within Europe.. (Perotti 1996, Alesina et al 2001).

- Complementary to other explanations (beliefs, history, culture, mobility, diversity, political constraints...)


1A: Government Resp. to Reduce Income Differences
1992 National Average, 1-5 Scale
4.5
4.0
3.5
3.0
BGR
ITA
SVN
HUN
POL
SVK
AUT
RUS
GBR
DEUW
PH
CZE
NOR
SWE
NZL
CAN
AUS
USA
20
30
45
1992 National Inequality, Log Gini Coefficient