

# **Gov 2006: Formal Political Theory II**

## **Section 3**

---

**Sophie Hill**

February 19, 2019

# Agenda

- Probabilistic voting: mini-review
- Models of spending on public goods (Downs, Bergstrom & Goodman, Meltzer & Richard, and beyond!)
- Brainstorming final paper ideas!

## Probabilistic voting: mini-review

- You should now be relatively familiar with the set-up of the probabilistic voting model...

## Probabilistic voting: mini-review

- You should now be relatively familiar with the set-up of the probabilistic voting model...
- In this model, there are two random shocks: an **individual** shock  $\sigma_i \sim U\left[-\frac{1}{2\phi}, \frac{1}{2\phi}\right]$  and a **common** shock  $\delta \sim U\left[-\frac{1}{2\psi}, \frac{1}{2\psi}\right]$

## Probabilistic voting: mini-review

- You should now be relatively familiar with the set-up of the probabilistic voting model...
- In this model, there are two random shocks: an **individual** shock  $\sigma_i \sim U\left[-\frac{1}{2\phi}, \frac{1}{2\phi}\right]$  and a **common** shock  $\delta \sim U\left[-\frac{1}{2\psi}, \frac{1}{2\psi}\right]$
- What is the substantive interpretation of the following terms?

## Probabilistic voting: mini-review

- You should now be relatively familiar with the set-up of the probabilistic voting model...
- In this model, there are two random shocks: an **individual** shock  $\sigma_i \sim U\left[-\frac{1}{2\phi}, \frac{1}{2\phi}\right]$  and a **common** shock  $\delta \sim U\left[-\frac{1}{2\psi}, \frac{1}{2\psi}\right]$
- What is the substantive interpretation of the following terms?
  - $\sigma_i$

## Probabilistic voting: mini-review

- You should now be relatively familiar with the set-up of the probabilistic voting model...
- In this model, there are two random shocks: an **individual** shock  $\sigma_i \sim U\left[-\frac{1}{2\phi}, \frac{1}{2\phi}\right]$  and a **common** shock  $\delta \sim U\left[-\frac{1}{2\psi}, \frac{1}{2\psi}\right]$
- What is the substantive interpretation of the following terms?
  - $\sigma_i$  = **individual ideology parameter**
  - $\delta$

## Probabilistic voting: mini-review

- You should now be relatively familiar with the set-up of the probabilistic voting model...
- In this model, there are two random shocks: an **individual** shock  $\sigma_i \sim U\left[-\frac{1}{2\phi}, \frac{1}{2\phi}\right]$  and a **common** shock  $\delta \sim U\left[-\frac{1}{2\psi}, \frac{1}{2\psi}\right]$
- What is the substantive interpretation of the following terms?
  - $\sigma_i$  = **individual ideology parameter**
  - $\delta$  = **incumbent popularity shock**
  - $\phi$

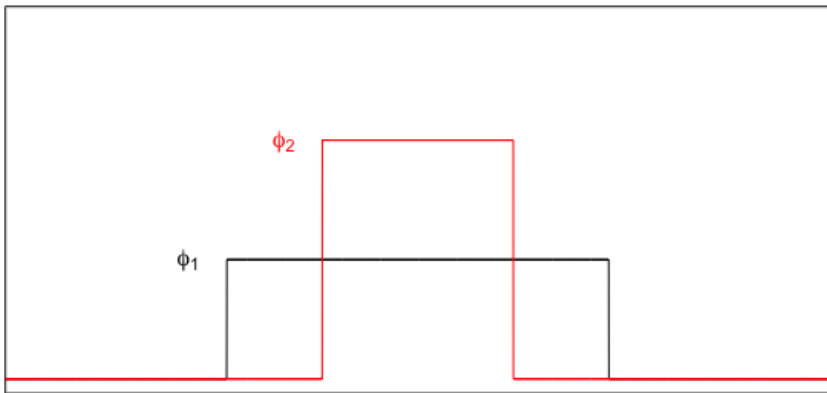


## Probabilistic voting: mini-review

- You should now be relatively familiar with the set-up of the probabilistic voting model...
- In this model, there are two random shocks: an **individual** shock  $\sigma_i \sim U\left[-\frac{1}{2\phi}, \frac{1}{2\phi}\right]$  and a **common** shock  $\delta \sim U\left[-\frac{1}{2\psi}, \frac{1}{2\psi}\right]$
- What is the substantive interpretation of the following terms?
  - $\sigma_i$  = **individual ideology parameter**
  - $\delta$  = **incumbent popularity shock**
  - $\phi$  = **voter sensitivity to policy**
- A common extension to this model is to let the ideology parameter have a group-specific distribution,  $\sigma_{ji}$ . We can then vary group-level ideology (i.e.  $\mathbb{E}[\sigma_{ji}] \neq \mathbb{E}[\sigma_{ki}]$ ) and sensitivity to policy (i.e.  $\phi_J \neq \phi_K$ ).

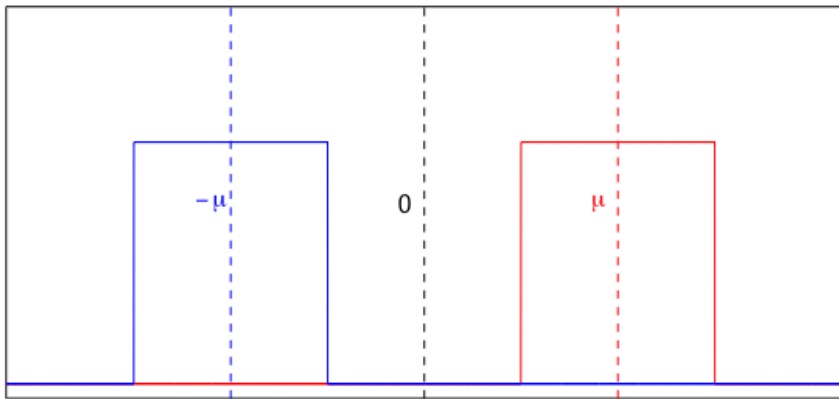
## Probabilistic voting: mini-review

Higher density = more sensitive to policy = “swing voters”



## Probabilistic voting: mini-review

Shift midpoint of  $\sigma$  = ideological bias = “partisans”

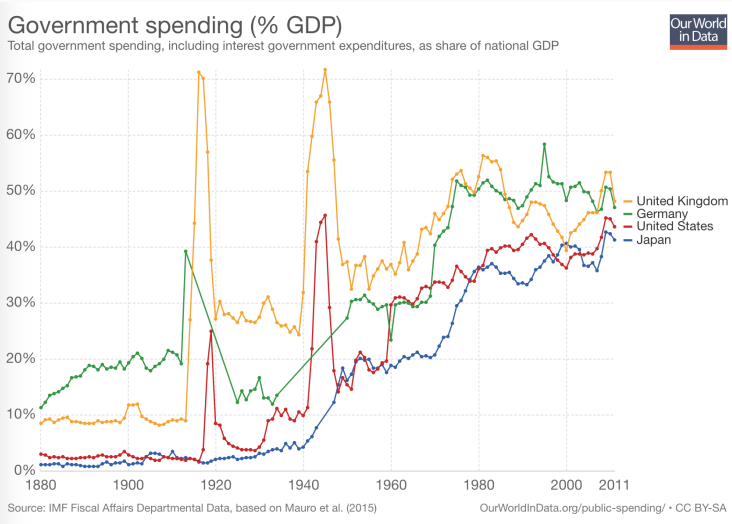


## Models of spending on public goods

The papers last week were speaking to two central puzzles of democratic distributive politics:

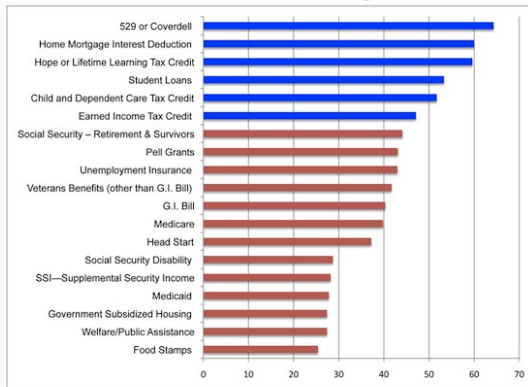
- Why is the size of government growing over time?
- How does “rational ignorance” affect provision of public goods?

# Models of spending on public goods



# Models of spending on public goods

**Percentage of program beneficiaries who report they "Have Not Used a Government Social Program"**



**Submerged state policies shown in blue.**

Source: Social and Governmental Issues and Participation Study of 2008. Telephone survey of 1400 Americans, conducted by Cornell Survey Research Institute.

## Models of spending on public goods

These are big motivating puzzles...

## Models of spending on public goods

These are big motivating puzzles... but let's start with a simpler question: how should we model citizen preferences over public goods?



## Bergstrom & Goodman, 1973

- Individual utility is a function of private and public goods:  $U_i = f(X_i, Z_i)$

## Bergstrom & Goodman, 1973

- Individual utility is a function of private and public goods:  $U_i = f(X_i, Z_i)$
- An individual derives utility from the total public good based on the population  $n$  and a “crowding parameter”  $\gamma$ :  $Z_i = \frac{Z}{n^\gamma}$

## Bergstrom & Goodman, 1973

- Individual utility is a function of private and public goods:  $U_i = f(X_i, Z_i)$
- An individual derives utility from the total public good based on the population  $n$  and a “crowding parameter”  $\gamma$ :  $Z_i = \frac{Z}{n^\gamma}$
- $\gamma = 1 \rightarrow$  purely private good

## Bergstrom & Goodman, 1973

- Individual utility is a function of private and public goods:  $U_i = f(X_i, Z_i)$
- An individual derives utility from the total public good based on the population  $n$  and a “crowding parameter”  $\gamma$ :  $Z_i = \frac{Z}{n^\gamma}$
- $\gamma = 1 \rightarrow$  purely private good
- $\gamma = 0 \rightarrow$  purely public good

## Bergstrom & Goodman, 1973

- Individual utility is a function of private and public goods:  $U_i = f(X_i, Z_i)$
- An individual derives utility from the total public good based on the population  $n$  and a “crowding parameter”  $\gamma$ :  $Z_i = \frac{Z}{n^\gamma}$
- $\gamma = 1 \rightarrow$  purely private good
- $\gamma = 0 \rightarrow$  purely public good
- Individual maximizes utility subject to her budget constraint  $X_i + \tau_i q n^\gamma Z_i \leq Y_i$ , where  $q$  is the unit cost of the public good and  $\tau_i$  is  $i$ 's tax share

## Bergstrom & Goodman, 1973

- Assume constant income and price elasticities for the public good  $\delta$  and  $\epsilon$

## Bergstrom & Goodman, 1973

- Assume constant income and price elasticities for the public good  $\delta$  and  $\epsilon$
- Then the demand function for  $Z_i$  has the form:  $c[\tau_i q n^\gamma]^\delta Y_i^\epsilon$

## Bergstrom & Goodman, 1973

- Assume constant income and price elasticities for the public good  $\delta$  and  $\epsilon$
- Then the demand function for  $Z_i$  has the form:  $c[\tau_i q n^\gamma]^\delta Y_i^\epsilon$
- So the demand for  $Z$  is:  $n^\gamma c[\tau_i q n^\gamma]^\delta Y_i^\epsilon = c q^\delta \tau_i^\delta Y_i^\epsilon n^{\gamma(1+\delta)}$



## Bergstrom & Goodman, 1973

- Assume constant income and price elasticities for the public good  $\delta$  and  $\epsilon$
- Then the demand function for  $Z_i$  has the form:  $c[\tau_i q n^\gamma]^\delta Y_i^\epsilon$
- So the demand for  $Z$  is:  $n^\gamma c[\tau_i q n^\gamma]^\delta Y_i^\epsilon = c q^\delta \tau_i^\delta Y_i^\epsilon n^{\gamma(1+\delta)}$
- We can estimate these elasticities by fitting this regression model:  
$$\log E = c + \alpha \log n + \delta \log \hat{\tau} + \epsilon \log \hat{Y} + \sum_{i=1}^k \beta_i X_i$$

## Bergstrom & Goodman, 1973

- Assume constant income and price elasticities for the public good  $\delta$  and  $\epsilon$
- Then the demand function for  $Z_i$  has the form:  $c[\tau_i q n^\gamma]^\delta Y_i^\epsilon$
- So the demand for  $Z$  is:  $n^\gamma c[\tau_i q n^\gamma]^\delta Y_i^\epsilon = c q^\delta \tau_i^\delta Y_i^\epsilon n^{\gamma(1+\delta)}$
- We can estimate these elasticities by fitting this regression model:  
$$\log E = c + \alpha \log n + \delta \log \hat{\tau} + \epsilon \log \hat{Y} + \sum_{i=1}^k \beta_i X_i$$
- where  $E$  = expenditures,  $n$  = # of households,  $\hat{\tau}$  = tax share of citizen with median income,  $\hat{Y}$  = median income, and the  $X_i$ 's are municipality socio-economic controls.

## Bergstrom & Goodman, 1973

- How does demand vary with income?

## Bergstrom & Goodman, 1973

- How does demand vary with income?
- Compute the total derivative:  $\frac{dD}{dY} = \frac{\partial D}{\partial Y} + \left(\frac{\partial D}{\partial \tau}\right) \left(\frac{\partial \tau}{\partial Y}\right)$

## Bergstrom & Goodman, 1973

- How does demand vary with income?
- Compute the total derivative:  $\frac{dD}{dY} = \frac{\partial D}{\partial Y} + \left(\frac{\partial D}{\partial \tau}\right) \left(\frac{\partial \tau}{\partial Y}\right)$
- In elasticity form:  $\left(\frac{Y}{D}\right) \left(\frac{dD}{dY}\right) = \epsilon + \delta\eta$

## Bergstrom & Goodman, 1973

- How does demand vary with income?
- Compute the total derivative:  $\frac{dD}{dY} = \frac{\partial D}{\partial Y} + \left(\frac{\partial D}{\partial \tau}\right) \left(\frac{\partial \tau}{\partial Y}\right)$
- In elasticity form:  $\left(\frac{Y}{D}\right) \left(\frac{dD}{dY}\right) = \epsilon + \delta \eta$
- $\epsilon$  = income elasticity of demand;  $\delta$  = price elasticity of demand;  $\eta$  = elasticity of tax share w.r.t income

## Bergstrom & Goodman, 1973

- How does demand vary with income?
- Compute the total derivative:  $\frac{dD}{dY} = \frac{\partial D}{\partial Y} + \left(\frac{\partial D}{\partial \tau}\right) \left(\frac{\partial \tau}{\partial Y}\right)$
- In elasticity form:  $\left(\frac{Y}{D}\right) \left(\frac{dD}{dY}\right) = \epsilon + \delta\eta$
- $\epsilon$  = income elasticity of demand;  $\delta$  = price elasticity of demand;  $\eta$  = elasticity of tax share w.r.t income
- If  $\epsilon + \delta\eta > 0$  for all  $Y$ , then individual demand for public goods is *increasing* in income (and *vice versa*)

## Bergstrom & Goodman, 1973

- How does demand vary with income?
- Compute the total derivative:  $\frac{dD}{dY} = \frac{\partial D}{\partial Y} + \left(\frac{\partial D}{\partial \tau}\right) \left(\frac{\partial \tau}{\partial Y}\right)$
- In elasticity form:  $\left(\frac{Y}{D}\right) \left(\frac{dD}{dY}\right) = \epsilon + \delta\eta$
- $\epsilon$  = income elasticity of demand;  $\delta$  = price elasticity of demand;  $\eta$  = elasticity of tax share w.r.t income
- If  $\epsilon + \delta\eta > 0$  for all  $Y$ , then individual demand for public goods is *increasing* in income (and *vice versa*)
- It is also possible that the sign of  $\epsilon + \delta\xi$  varies across values of  $Y$ , in which case the relationship is non-monotonic



## Bergstrom & Goodman, 1973

- We can estimate  $\epsilon$  and  $\delta$  directly from the regression. What about  $\xi$ ?

## Bergstrom & Goodman, 1973

- We can estimate  $\epsilon$  and  $\delta$  directly from the regression. What about  $\xi$ ?
- Approximate it with commonly accepted estimates of income elasticity of demand for housing  $\approx 1 - 1.3$

## Bergstrom & Goodman, 1973

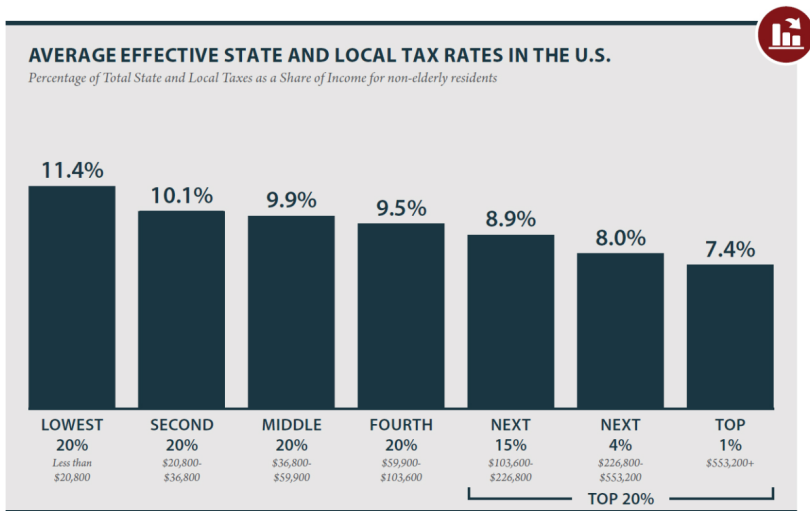
- We can estimate  $\epsilon$  and  $\delta$  directly from the regression. What about  $\xi$ ?
- Approximate it with commonly accepted estimates of income elasticity of demand for housing  $\approx 1 - 1.3$
- Almost all the estimates of  $\epsilon$  are *greater* than  $-(1.3)\delta$

## Bergstrom & Goodman, 1973

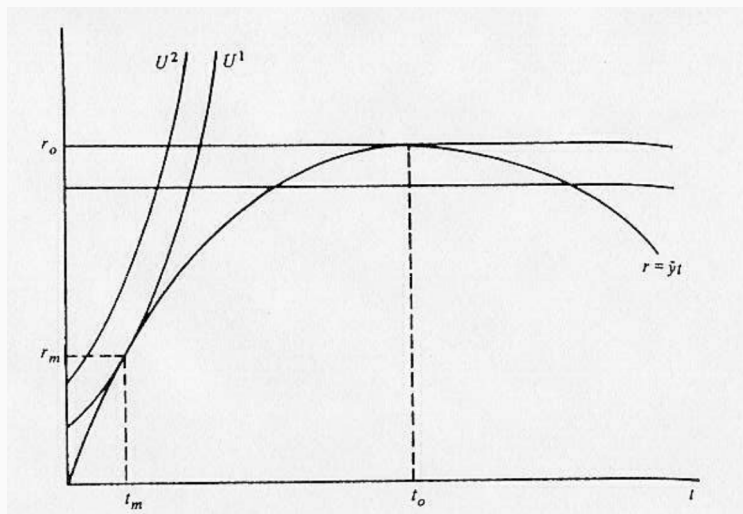
- We can estimate  $\epsilon$  and  $\delta$  directly from the regression. What about  $\xi$ ?
- Approximate it with commonly accepted estimates of income elasticity of demand for housing  $\approx 1 - 1.3$
- Almost all the estimates of  $\epsilon$  are *greater* than  $-(1.3)\delta$
- Hence we seem to be in a world where  $\epsilon + \delta\xi > 0$ , i.e. demand for public goods *rises* with income

**Question:** How can we reconcile this with Meltzer-Richard? Is there something about this empirical context that doesn't fit the M-R model?

# U.S. state & local taxes



## Meltzer-Richard, in one chart!



## Downs, 1960

Several key assumptions:

1. Voters are **rationaly ignorant**

## Downs, 1960

Several key assumptions:

1. Voters are **rationaly ignorant**
2. Voters are more aware of the costs (i.e. the taxes they pay) than the benefits (which may be geographically or temporally remote) of public spending



## Downs, 1960

Several key assumptions:

1. Voters are **rationaly ignorant**
2. Voters are more aware of the costs (i.e. the taxes they pay) than the benefits (which may be geographically or temporally remote) of public spending
3. Politicians determine public spending solely to win votes

## Downs, 1960

Several key assumptions:

1. Voters are **rationally ignorant**
2. Voters are more aware of the costs (i.e. the taxes they pay) than the benefits (which may be geographically or temporally remote) of public spending
3. Politicians determine public spending solely to win votes

Thus, electoral competition puts downward pressure on public spending – it is smaller than it would be if voters were fully informed.

## Downs, 1960

Several key assumptions:

1. Voters are **rationally ignorant**
2. Voters are more aware of the costs (i.e. the taxes they pay) than the benefits (which may be geographically or temporally remote) of public spending
3. Politicians determine public spending solely to win votes

Thus, electoral competition puts downward pressure on public spending – it is smaller than it would be if voters were fully informed.

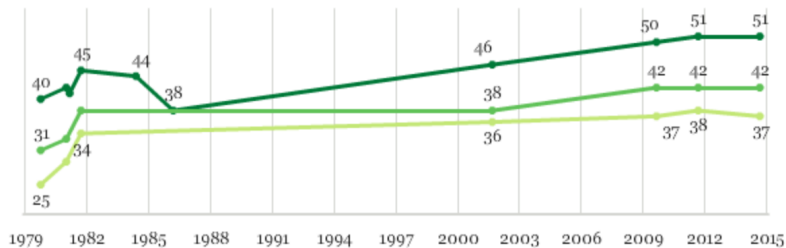
Questions: Are voters rationally ignorant, or genuinely misinformed? Is (3) plausible? Can we reconcile this argument with the empirical fact of growing government budgets?

## Downs, 1960

### *Americans Say the Federal Government Wastes More of Each Tax Dollar Than They Say State and Local Governments Waste*

How many cents of each tax dollar would you say are wasted?

- Cents wasted by the federal government (mean)
- Cents wasted by state government (mean)
- Cents wasted by local government (mean)



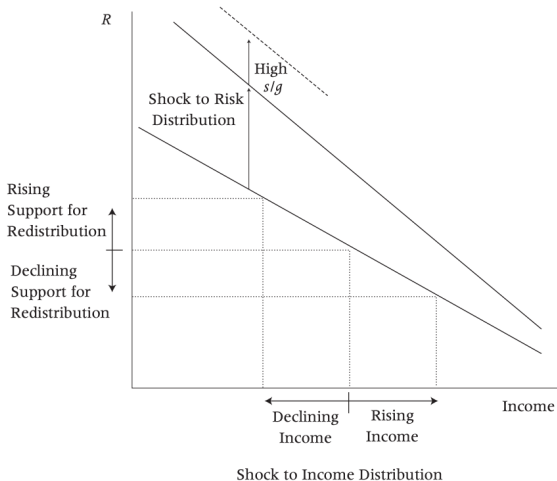
GALLUP®

## Extensions of M-R

1. Public spending is about **insurance** as well as redistribution
2. Voters may have **non-economic preferences** over redistribution (ethnicity, social affinity, deservingness)
3. Voters' behavior is reinforced by their **beliefs** about the returns the hard work – “American” vs “European” equilibria
4. Electoral competition in a multidimensional space results in **issue bundling**

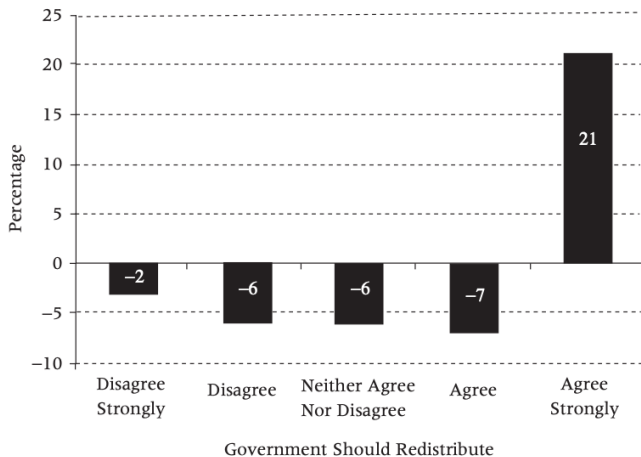
# 1. The insurance model (Iversen et al.)

Figure 7.2 Support for Redistribution as a Function of Income and Risk



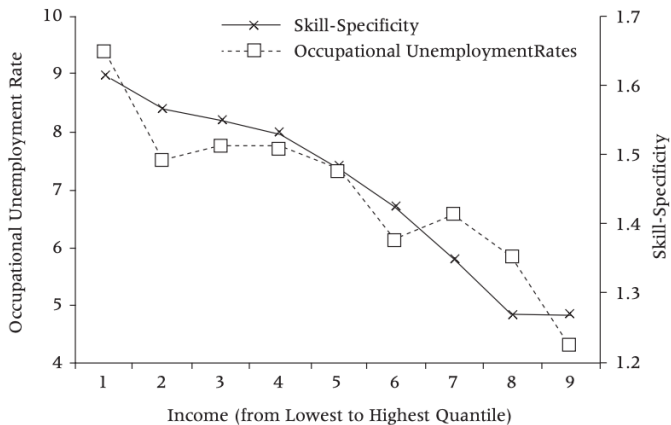
# 1. The insurance model (Iversen et al.)

Figure 7.6 Changes in Redistributive Preferences as a Function of an Increase in Occupational Unemployment Rates and Skill-Specificity



# 1. The insurance model (Iversen et al.)

Figure 7.9 Relationship Between Income and Risk Exposure

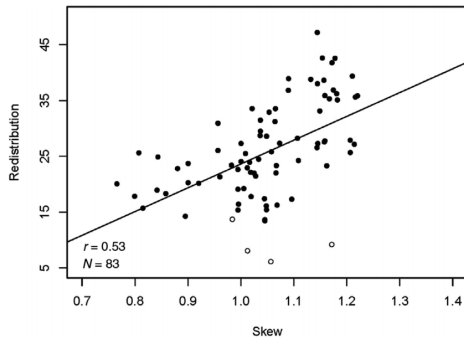


Source: Authors' compilation. Simulations based on model 1 in table 7.1.



## 2. Non-economic preferences

**FIGURE 1. Redistribution and Skew**



*Note:* Open circles represent Swiss observations.

Lupu & Pontusson, “The Structure of Inequality and the Politics of Redistribution”, 2011, APSR

### 3. Beliefs

Social spending (percent of GDP)<sup>a</sup>

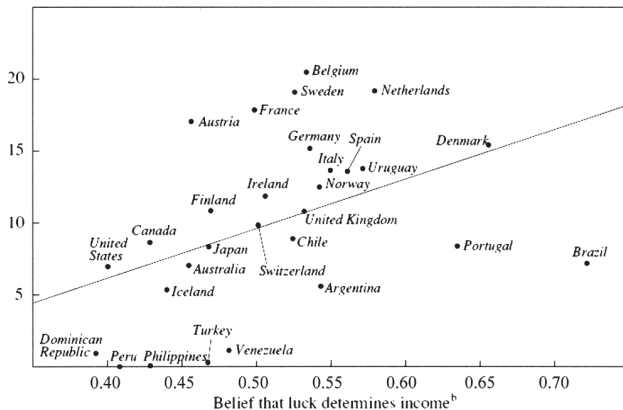


FIGURE I  
Beliefs and Policies

(Source: Alesina, Glaeser, and Sacerdote [2001]). a) Average for 1960–1998. b) Mean value for country, measured as an index from 1 to 10, with 10 indicating strongest belief; data for 1981–1987).

## 4. Issue bundling

### Why the poor do not expropriate the rich: an old argument in new garb

John E. Roemer\*

*Department of Economics, University of California, Davis, CA 95616, USA*

Received 31 December 1995; received in revised form 30 June 1997; accepted 23 March 1998

---

#### Abstract

We consider a political economy with two partisan parties; each party represents a given constituency of voters. If one party (Labour) represents poor voters and the other (Christian Democrats) rich voters, if a redistributive tax policy is the only issue, and if there are no incentive considerations, then in equilibrium the party representing the poor will propose a tax rate of unity. If, however, there are *two* issues – tax policy and religion, for instance – then this is not generally the case. The analysis shows that, if a simple condition on the distribution of voter preferences holds, then, as the salience of the non-economic issue increases, the tax rate proposed by Labour in equilibrium will fall – possibly even to zero – even though a majority of the population may have an ideal tax rate of unity. © 1998 Elsevier Science S.A. All rights reserved.