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Public Goods, General-Interest Policies and Redistribution

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Public Goods, Collective Action and Political Science

Before Olson:

Everyone thought that agents which have identical interests and preferences, have no problem to organize their cooperation.

For instance, if workers have identical interests (higher wages), they will eventually join or establish a union, which then demands higher wages.

But that's wrong.

Olson has shown that cooperation is not self-enforcing even if agents have identical interests, since

public good is costly
each individual is better off if the other individuals provide the public good.

.
In other words:

Cooperative provision of public goods creates collective action problems, which resemble a prisoner's dilemma.

Mechanism that ensure cooperation in the presence of collective action problems

1. Combine public goods with almost private goods
   i.e. automobile clubs organize free technical help for members
   (technical help is an insurance, hence not in any strict sense a public good, but rather a ‘club good’)

2. punish free-riders
   here is where the ‘state’ comes in…

3. try to transfer public goods into club goods
   for instance, unions negotiate wage increases only for their members, BUT employers grant those wage increases to all employees

   hence: unions want to maximize membership incentives, corporations minimize membership incentives

4. collect contributions and pay someone for the provision of the public good

   cooperation becomes more visible, and thus free-riding is more easily to detect
   for instance, charity organizations give stickers to those who gave some money

else?

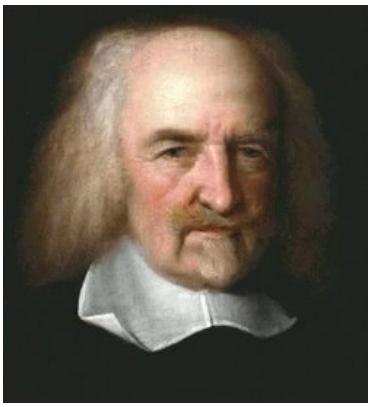
Before we discuss government…
…here is a typology of goods

rivalry	excludability: yes	excludability: no
yes	private goods	common pool resources
no	club goods	public goods

According to this typology, what is a public good?

Some old farts on the state

for example Hobbes

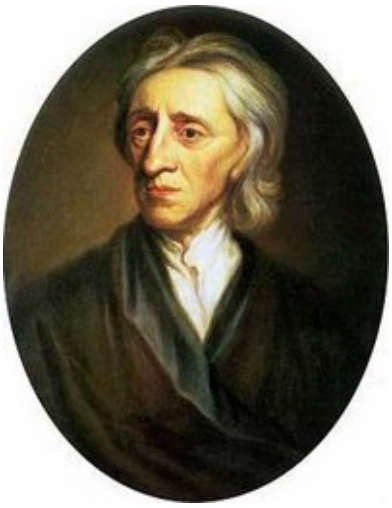


In *Leviathan*, Hobbes set out his doctrine of modern natural right as the foundation of societies and legitimate governments. In the natural condition of mankind, while some men may be stronger or more intelligent than others, none are so strong and smart as to be beyond a fear of violent death. When threatened with death, man in his natural state cannot help but defend himself in any way possible. Self-defense against violent death is Hobbes' highest human necessity, and rights are borne of necessity. In the state of nature, then, each of us has a right to everything in the world. Due to the scarcity of things in the world, there is a constant, and rights-based, "war of all against all" (*bellum omnium contra omnes*). Life in the state of nature is "solitary, poore, nasty, brutish, and short" (xiii).

But war isn't in man's best interest. According to Hobbes, man has a self-interested and materialistic desire to end war — "the passions that incline men to peace are fear of death, desire of such things as are necessary to commodious living, and a hope by their industry to obtain them" (xiii, 14). He forms peaceful societies by entering into a social contract.

(source: Wikipedia)

or: John Locke



Locke posits a state of nature as the proper starting point for examining politics. Individuals have rights, and their duties are defined in terms of protecting their own rights and respecting those of others. Through the law of nature, which Locke describes as "reason," we are able to understand why we must respect the natural rights of others (including the right to property for which one has laboured). In practice, the law of nature is ignored and so government is necessary; this can be created only by the consent of the governed, which can be had only to a commonwealth of laws.

(Source Wikipedia)

and many, many more…

have just argued that the state provides the public good of individual safety

They make two claims, and both are trivial, but still a bit wrong:

a) public goods cannot be provided in the absence of a state.

b) the provision of public goods is in everyone’s interest.

The Samuelson Rule and Optimal Public Good Provision

The Samuelson-Rule is pretty simple:

It suggests that governments provide as many public goods, as maximize the aggregated utility of the population.
This state is reached if the increase in aggregate utility from the provision of an additional unit of public goods is just as large as the aggregate increase in utility would be from the production of private goods by the same input factors.

This rule highlights the fact that governments collect taxes (use resources) to produce public goods. The production of public goods thus reduces the production private goods. The production of public goods is thus only welfare enhancing if the utility from the public good (produced input from labor and capital) exceeds the utility from the production of private goods by the same amount of capital and labor.

An Algebraic Statement of the Samuelson Model

(http://www.gams.com/solvers/mpsge/samuels.htm)

Zero Net Profit for Private Production

The unit cost of production in sector A_s is given by a nested Leontief - Cobb-Douglas function defined over the cost of intermediate inputs and primary factors with ad-valorem taxes on factor demands. Unlike the Harberger models, tax rates in this model are determined endogenously. In equilibrium, the unit cost must be no less than the market price of output:

$$-\Pi_s = \sum_g p_g B_{bs} + \phi_s \left(\prod_f (w_f(1+\tau\, t_{fs}))^{\alpha_{fs}} \right) - p_s \geq 0 \qquad \forall s$$

Zero Net Profit for Public Sector Contractors

The unit cost of public provision is determined by the market price of commodity inputs to the Leontief activity. Input requirements are defined by a vector of public sector input coefficients, a_g. In equilibrium, the price paid by the government equals the cost of market inputs:

$$\sum_g p_g a_g - p_G \geq 0$$

Income Balance for Government

Government tax income (*PT*) is determined by the value of tax revenue, calculated using activity levels, compensated demands, market prices and ad-valorem tax rates. In equilibrium, the value of tax revenue equals the market cost of public sector output:

$$PT = \sum_s \frac{\partial \Pi_s}{\partial (w_f(1+\tau\, t_{fs}))} \quad AL_s w_f \tau\, t_{fs} = p_G G$$

Income Balance for Households

Household income is determined by the net of tax return to primary factors plus the imputed value of public provision:

$$M_h = \sum_f w_f E_{fh} + v_h G$$

Market Clearance for Private Goods

Producer output is equal to the sum of intermediate plus final demand:

$$AL_g \geq \sum_s AL_s B_{gs} + \sum_h \frac{\gamma_h M_h}{e_h(p)} \left(\frac{e_h(p)}{p_g} \right)^{\sigma_h}$$

where γ_h is the household budget share devoted to the consumption of goods, and e_h is the "unit expenditure function" which may be written:

$$e_h(p) \equiv \left(\sum_i \beta_{ih} p_i^{1-\sigma_h} \right)^{\frac{1}{1-\sigma_h}}$$

Personalized Markets for Public Goods

We assume a "pure" public good in this model, hence each household may attach a different marginal valuation to public provision in an equilibrium. In order to compute these marginal values, we include a separate public good "market" for each houshold which balances the level of provision with the household "demand":

$$G = \frac{\mu_{Gh} M_h}{v_h} \quad .$$

in which μ_{Gh} is the budget share of public goods in the top-level Cobb-Douglas preferences of household *h*.

Market Clearance for Factors

The aggregate supply of factors equals the sum of producer and consumer demand. Producers pay taxes on factor inputs, consumers do not because we consider these demands to be "leisure" or "household production". Consumer demands for factors are specified as Cobb-Douglas (constant budget shares):

$$\sum_h E_{fh} = \sum_s AL_s \frac{\partial \Pi_s}{\partial (w_f (1 + \tau\, t_{fs}))} + \sum_h \frac{\mu_{fh} M_h}{w_f}$$

Samuelson Rule for "Optimal" Provision of Public Goods

The tax rate multiplier is adjusted to balance the marginal cost of public provision with the summation across households of marginal willingness to pay. Due to the existence of household factor demand, factor taxes are necessarily distortionary and there will be an excess social cost of public funds. For this reason, the Samuelson rule is neither necessary nor sufficient for optimal provision. We apply the rule here merely to illustrate the programming methodology, even though the resulting equilibrium may be "suboptimal":

$$p_G = \sum_h v_h$$

Redistribution by the Production of Public Goods

‘Winners’ of Public Good Production

- actors that heavily use public goods
- actors that contribute moderately to its provision (that pay little taxes)

‘Loser’ of Public Good Production

- actors that rarely use public goods
- actors that contribute a lot to its provision

Example 1: Pensions

Why have pension expenditures risen sharply in postwar history?

Are pension expenditures too high?

In some countries, de facto interest in pension expenditures falls short of return on assets in private investment or are even negative.

Persson and Tabellini assume

three groups:

young workers (20-40 y.)
old workers (40-60 y.)
pensioners (60-80 y.)

They show that old workers (which have already transferred resources to pensioners, and of course pensioners are always in favor of intergenerational transfers, whereas young workers are opposed to those transfers and favor private savings.

Hence, social security systems ‘log-in’.

Example 2: On the Distribution of Social Security Spending

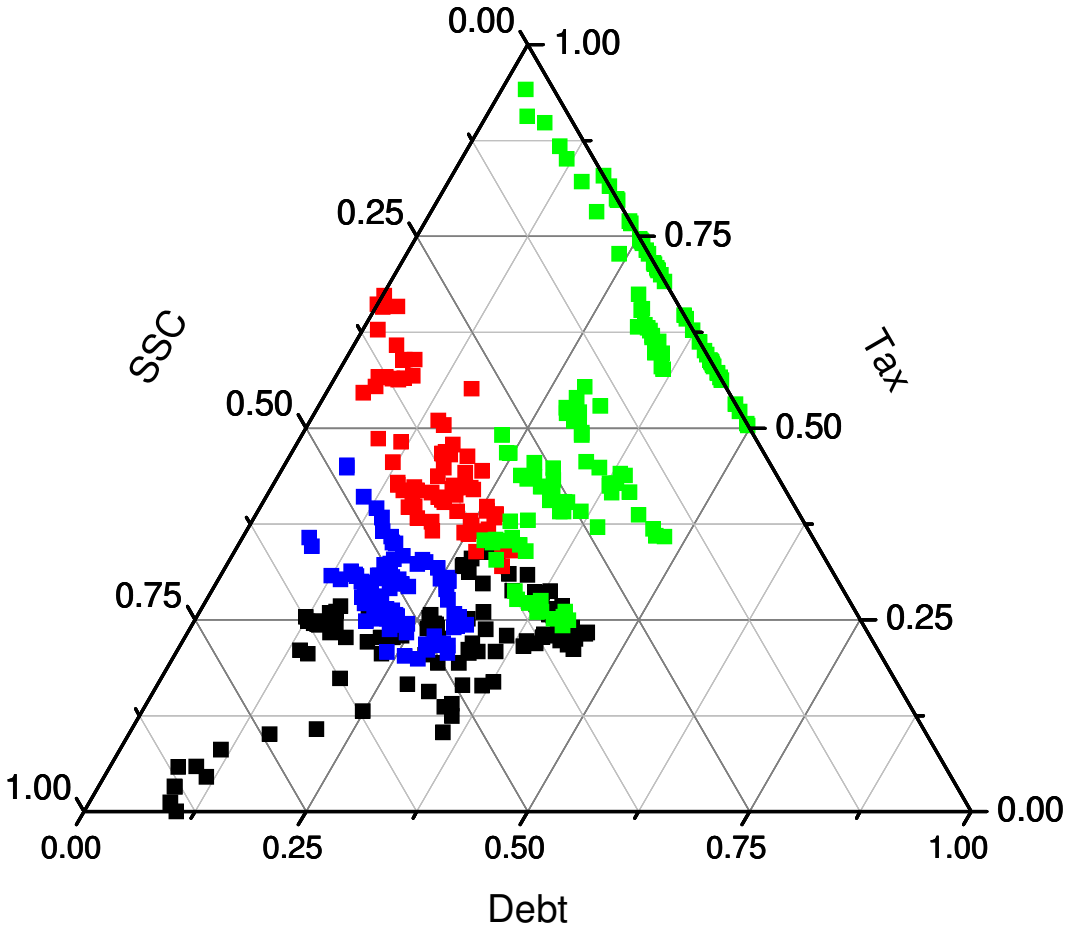


Figure 1: Ternary of relative importance of policy instruments

green: Anglo-Saxon countries, Denmark (tax based, indep. CBI
red: Scandinavian countries (tax based, dependent CB)
blue: continental European countries (transfer based)
black: South European countries (debt-intense)

Table 1: Expenditures, Revenue, Debt, 17 OECD countries 1972-1995

	Total Expenditures	Total Tax Revenue	Social Security Contributions as a % of GDP	Debt as a % of GDP
USA 1972-1995	33.1 - 35.6	27.7 – 28.7	5.7 – 7.8	40.4 – 63.1
Canada 1972-1995	37.2 - 48.1	33.1 – 40.4	3.0 – 6.3	52.1 – 100.5
UK 1972-1995	39.2 - 44.2	33.6 – 35.5	5.2 – 6.3	68.6 – 59.7
Netherlands 1972-1995	44.9 – 54.2	40.3 – 43.9	14.1 – 18.4	46.0 – 78.5
Belgium 1972-1995	39.6 – 54.6	37.0 – 46.5	11.7 – 15.4	62.0 – 131.2
Italy 1972-1995	37.0 – 51.8	28.5 – 41.3	11.2 – 13.1	49.3 – 124.3
Finland 1972-1995	32.4 – 59.1	33.9 – 46.5	4.4 – 12.9	13.1 – 58.1
Sweden 1972-1995	45.5 – 67.0	44.2 – 49.7	8.5 – 14.5	30.7 – 80.1
Norway 1972-1995	45.0 – 48.9	48.2 – 41.5	12.7 – 9.8	42.4 - 43.1
Denmark 1972-1995	40.4 – 61.6	42.9 – 51.5	1.7 – 1.6	17.6 – 73.6
Australia 1972-1995	26.5 – 37.3	24.9 – 30.6	0 – 0	31.3 – 43.4
France 1972-1995	37.3 – 54.1	35.6 – 44.5	14.7 – 19.3	30.8 – 60.1
Switzerland 1972-1995	27.2 – 36.6	23.9 – 33.7	5.6 – 12.6	24.6 – 37.1
Spain 1972-1995	22.5 – 45.3	18.5 – 33.9	7.5 – 12.3	14.7 – 71.0
Portugal 1972-1995	22.5 – 45.3 (1992)	22.5 – 34.9	6.4 – 9.4	17.5 – 69.2
Germany 1972-1995	38.8 – 49.2	37.3 – 41.2	12.1 – 15.4	18.5 – 62.2 (1990: 45.5)

Austria 1972-1995	35.6 – 51.5	37.2 – 44.0	9.3 – 15.4	17.1 – 69.3
Minimum – maximum 1972	22.5 – 44.5	18.5 – 48.2	0 – 14.7	13.1 – 68.6
Minimum – maximum 1995	35.6 – 67.0	28.7 – 51.5	0 – 19.3	37.1 – 131.2

Source: IMF OECD

see Mueller Public Choice III, p. 503

Table 3: TSCS-regression with panel corrected standard errors and correction of serial correlation in the errors, 17 OECD Countries, 1974-1995

Independent variables	*Model 1* Dependent variable: Δdebt β-coefficients (z-statistic)	*Model 2* Dependent variable: Δtax β-coefficients (z-statistic)	*Model 3* Dependent variable: Δssc β-coefficients (z-statistic)
z-transformed and de-trendet debt	-	0.57 (0.77)	-0.93 (-3.93)
z-transformed and de-trendet tax	-0.076 (-4.62)	-	-0.37 (-2.98)
z-transformed and de-trendet ssc	-0.054 (-3.69)	-0.16 (-0.46)	-
Growth	-0.21 (-5.96)	-0.44 (-0.19)	-4.19 (-5.05)
Unemployment	0.001 (4.14)	-0.03 (-1.96)	-0.01 (-1.84)
Openness	0.004 (0.44)	-0.23 (-0.96)	-0.07 (-0.47)
Left	-0.003 (-0.99)	0.08 (0.56)	-0.01 (-0.20)
Constant	0.05 (3.39)	0.40 (1.19)	0.71 (6.82)
R^2	0.18	0.03	0.14
N obs.	392	392	392
Rho	0.713	0.13	-0.13
estimation procedure	xtpcse, c(ar1)	xtpcse, c(ar1)	xtpcse, c(ar1)