

# Promoting Education under Distortionary Taxation: A Comparison between Equality of Opportunity and Welfarism

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# Introduction

- ▶ Policies derived from a social welfare function (SWF)
- ▶ Basic categories of SWF's: Welfarist SWF (e.g. utilitarian), Equality of Opportunity (EOp).
- ▶ EOp:
  - ▶ Differences in outcomes between individuals should not depend on differences in individual circumstances beyond the individuals' control, differences in outcomes should only depend on differences in individuals' efforts.
  - ▶ Starting point Rawlsian theory of justice (Rawls' emphasis on the role of "primary commodities" in individuals' outcomes and the need to equalize their distribution).
- ▶ Here: Comparison of optimal policies from welfarist and **two**-types of EOp-models using framework with both "pure" redistribution and public provision/subsidization (education).

# The basic framework

- ▶ Individual  $i$ 's utility function

$$u^i = u \left[ e \left( c^i, g \right) x^i, l^i \right]$$

- ▶ with  $e$  = education,  $c$  = private purchase of education,  $g$  = public provision of education,  $x$  = consumption of goods, and  $l$  = effort. The individual maximizes this subject to the budget constraint which in the case the linear income tax with  $b$  = basic income is

$$x^i + c^i \leq (1 - t) w^i l^i + b$$

- ▶ This gives the indirect utility  $v^i = v \left[ (1 - t), b, g, w^i \right]$  and the corresponding behavioral equations for  $e^i$  etc.

- ▶ The welfarist SWF is

$$\sum_i W \left[ v^i \left( (1-t), b, g, w^i \right) \right]$$

- ▶ The general EOp SWF is

$$\sum_i O \left[ e^i \left( (1-t), b, g, w^i \right), g \right]$$

- ▶ We assume that the SWF is averse to inequality in educational attainment ( $O' > 0$ ,  $O'' < 0$ ).
- ▶ The specific EOp SWF is based on the theory by Fleurbaey et. al., here on Fleurbaey and Valletta (2015).

- ▶ This SWF is a leximin of lump sum transfers equalizing the welfare of each citizen hypothetically living in the same (salient) circumstances but otherwise in laissez faire conditions to their actual welfare under current policies. For arbitrary person the required transfer is

$$\tau^0 = \tau^0 [\bar{c}, \bar{w}, v^0]$$

- ▶ It can be argued that the salient circumstances are the average wage rate  $\bar{w}$  and the average cost of education  $\bar{c}$ .
- ▶ Obviously in all cases the the choice of policies is constrained by the relevant government budget constraint.

## Optimal linear tax rate 1

- ▶ The optimal linear tax rate with these three SWF's are (first welfarist, then general EOp, then the specific EOp):

$$\frac{t^{WF}}{1 - t^{WF}} = \frac{1}{\epsilon} \left[ 1 - \frac{wl(\beta)}{\overline{wl}} \right] \quad (1)$$

$$\frac{t^{EOp}}{1 - t^{EOp}} = \frac{1}{\epsilon} \left[ 1 - \frac{\tilde{O}}{\overline{wl}} \right] \quad (2)$$

$$\frac{t^{EOpS}}{1 - t^{EOpS}} = \frac{1}{\epsilon} \left[ 1 - \frac{w^0 l^0}{\overline{wl}} \right] \quad (3)$$

- ▶ Here  $\epsilon$  is the elasticity of total income with respect to the net of tax rate  $1 - t$ ,  $wl(\beta)$  denotes the welfare-weighted average income,  $\overline{wl}$  is the average income, and  $\tilde{O}$ .

## Optimal linear tax rate 2

- ▶ Here

$$\tilde{O} = -\frac{\sum O' \frac{\partial e}{\partial c^i} \frac{\partial c^i}{\partial t}}{\sum O' \frac{\partial e}{\partial c^i} \frac{\partial c^i}{\partial b}}$$

- ▶  $\tilde{O}$  measures the impact of the income taxation relative to the effect of additional income on education
  - ▶
- ▶ The formulas differ only in the way the SWF takes into account the inequality of resources among citizens.
- ▶ (1) and (3) are special cases of the linear tax rate formula in Saez and Stancheva (2016).

# Commodity taxation 1

- ▶ Education can be subsidized by increasing taxes on consumption of ordinary goods. Let  $t_j$  denote the tax on good  $j$  and  $q_j$  the consumer price of goods. Now the optimal taxes are

$$WF : \sum_i \sum_j t_j \frac{\partial \tilde{x}_k^i}{\partial q_j} = N \text{cov} \left( \rho^i, x_k^i \right) \quad (4)$$

$$EOp : \sum_i \sum_j t_j \frac{\partial \tilde{x}_k^i}{\partial q_j} = N \text{cov} \left( \rho^i, x_k^i \right) - \frac{1}{\mu} \sum_i O' \frac{\partial \tilde{e}^i}{\partial q_k} \quad (5)$$

$$EOpS : \frac{x_j^0}{\bar{x}_j} = 1 + \sum_k \frac{t_k}{1 + t_j} \frac{\bar{x}_k}{\bar{x}_j} \epsilon_{q_j}^k \quad (6)$$

- ▶ Here  $\rho^i$  is the net social marginal utility of money for person  $i$ ,  $\mu$  the Lagrange multiplier for the government budget constraint, the tilde denotes the compensated demand.



## Commodity taxation 2

- ▶ With *WF* and *EOpS* it is possible that education should not be subsidized, but taxed.
- ▶ But with *EOp* it is more likely that education should be subsidized.
- ▶ With *EOpS* taxes should be higher for goods the consumed relatively little by the worst-off, relatively small (even negative) for goods consumed relatively much by the worst-off.
- ▶ Subsidies targeted to the poor?
  - ▶ Linear income tax with subsidies/taxes on private purchases of educational services, the optimal subsidy/tax:

$$1 - \frac{c_o}{\bar{c}} = -\frac{\rho}{1-\rho} \epsilon_{1-\rho}^c$$

Here  $\rho$  is subsidy/tax. If  $\epsilon_{1-\rho}^c > 0$ , then subsidy optimal if  $1 - \frac{c_o}{\bar{c}} > 0$

# Non-linear income taxation with subsidies/taxes on purchases of educational services

- ▶ EOp:
  - ▶ Results for mixed taxation (non-linear income tax, commodity taxes)
  - ▶ Use of educational services should be subsidized.
  - ▶ The standard end-point results do not hold: optimal marginal tax rates non-zero, in general. Optimal policies (in otherwise similar setting) to reduce poverty leads to analogous result (Kanbur-Paukkeri-Pirttilä-Tuomala 2016).
- ▶ EOpS (Fleurbaey-Valletta 2015)
  - ▶ Acquisition of education subsidized at the margin.
  - ▶ Earnings are subsidized at low levels of income for individuals, depending on how much they spend on educational services.

# Public provision of education

- ▶ Public provision of education also studied, new formulations for rules established.
- ▶ WF: Public provision optimal if public provision is highly valued by low income people with high social net marginal value of income.
- ▶ EOp: Public provision provided the impact of provision on educational attainment is large enough relative to the impact of higher income on educational attainment.
- ▶ EOoS: Result analogous to the EOp case.

# Concluding comments

- ▶ SWF matters.
- ▶ EOp's may give surprising results.
- ▶ To do: results for mixed taxation in all cases?