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Redistributive taxation vs. education subsidies: Fostering equality and social mobility in an intergenerational model

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ABSTRACT

Redistributive taxation and education subsidies are common policies intended to foster education attendance of poor children. However, this paper shows that in an intergenerational framework, these policies can raise social mobility only for some investment situations but not in general. I also study the impact of both policies on the aggregate skill ratio and inequality. While redistributive taxation can raise social mobility but at the same time never reduces inequality, education subsidies can, under some conditions, achieve both simultaneously. Unfortunately, these conditions necessarily require a population in which the skill ratio is already quite high.

1. Introduction

Educational decisions determine a great part of future income[1] and therefore potential inequality within and across generations. The wage gap, needed to induce investment, implies that it is easier for rich parents than for poor ones to invest in the education of their children. Recently, Rumberger (2009) has found a strong effect of adult economic status on college competition and children's earnings. In this context, several policy interventions that foster investment incentives of the poor and therefore equalize the distribution of human capital are possible. The present paper analyzes the impact of two of them – redistributive taxation and education subsidies[2] – on the aggregate proportion of educated people as well as on social mobility and inequality.[3]

The paper is related to a great number of intergenerational models focusing on potential multiplicity of steady states (SSs), inequality, and social mobility. This body of literature starts with Gary S. Becker. In a paper with Nigel

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[1] One of the earliest studies that shows a positive effect of schooling on earning is by Mincer (1958). A critical discussion on the Mincer equation and its assumptions is given by Björklund and Kjellström (2002). There is also evidence that the return to schooling has increased over the last decades (OECD, 2009, Indicator A7).

[2] In the present context, subsidies are transfer payments to the households that invest in education.

[3] A higher degree of social mobility benefits intergenerational equity. Inequality within a generation is measured as the difference between skilled and unskilled wages.

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Tomes, he shows that there is a unique equilibrium which is characterized by social immobility and inequality (Becker & Tomes, 1979). Here, wages of the skilled and unskilled are exogenous and not determined by the measures of both occupation types. Inequality in this model is mainly driven by luck. Some other papers, assuming endogenously determined wages and homogenous agents, find a continuum of SSs which mostly are also characterized by inequality and the absence of social mobility (Banerjee & Newman, 1993; Freeman, 1996; Galor & Zeira, 1993; Mookherjee & Ray, 2003).[4] In these models the equilibrium outcome is determined by initial conditions, i.e., there is great history dependence. But according to Maoz and Moav (1999), Mookherjee and Napel (2007) and Napel and Schneider (2008), these results are strongly connected to the assumption of homogenous agents.[5] If children are heterogenous with respect to their inherent talent it becomes possible that a poor parent invests in his highly talented child and also that a rich parent rejects investment in his low-talented child. Thus, steady states with social mobility (SSM) are fostered by heterogeneity. In Mookherjee and Napel (2007), steady states are characterized by inequality and social mobility. They are locally unique; and under some conditions, global uniqueness is provided.

Although there are many intergenerational models of human capital investment, I am aware of only one paper that investigates the impact of different policy interventions on long-run output. Mookherjee and Ray (2008) compare the effects of unconditional and conditional transfers on per capita output and welfare. However, using the simplifying assumption of homogenous education costs, they do not find any social mobility in equilibrium. Therefore, I analyze the workings of a redistributive tax and education subsidies in a model where education costs are heterogenous and a child's talent depends on his parent's talent. Instead of per capita outcome and welfare the focus is on the aggregate skill level, inequality, and social mobility.

It can be shown that generally, neither redistributive taxation nor education subsidies can both decrease inequality and increase social mobility. Depending on the type of SSM, i.e., the equilibrium investment decisions of all parents without any public intervention, the impact of both policies on inequality and social mobility is analyzed. While redistributive taxation and subsidization have similar outcomes for some types of SSMs, they have different effects on the skill ratio for other types. Under most circumstances there is a trade-off between the reduction of inequality and the increase of social mobility. However, the paper shows that in a situation where unskilled parents are indifferent in their investment decision for a child with low costs, education subsidies can reach both targets at the same time. Unfortunately, this result only holds for a population with a high initial aggregate skill ratio.

The paper is organized as follows: the basic intergenerational model without policy intervention is presented in Section 2. Section 3 studies the impact of redistributive taxation on the skill ratio as well as on inequality and social mobility. Section 4 does the same for education subsidies. Conclusions are discussed in Section 5.

2. Model

Assume an overlapping generations model that involves a unit mass of families. At each point in time, a family consists of a parent and a child. The parent can work as a skilled (s) or an unskilled (n) worker. The aggregate skill ratio of the population at time t is denoted by λ_t. Skilled work requires a costly education while unskilled work does not. Education costs, i.e., any kind of monetary costs like tuition fees, private lessons, expenditures for books, etc., depend on the talent[6] of the child and must be financed out of the parent's current income. The latter assumption goes back to Loury (1981). One can argue that this is an unrealistic assumption, but qualitative results are robust as long as capital markets are imperfect. Empirical evidence for the negative effect of borrowing constraints on intergenerational equality is given by Gaviria (2002). Heckman and Krueger (2003) give a detailed discussion on credit constraints. For simplicity, I assume that there are only two possible types of talent, with corresponding education costs x^l for a highly talented child and x^h for a low-talented child, respectively; the child's talent is private information of the parent. The fractions of both types of talent are exogenously given and fixed over time. The talent of a child depends on the talent of his parent in a Markovian way. Thus, for $i, j \in \{l, h\}$ the conditional probability $p_{i\to j}$ denotes the probability that a parent with education costs x^i has a child with education costs x^j. Although the model assumes a restrictive talent distribution, the qualitative results persist if there are r discrete ability types. In such a setup, x^l and x^h would refer to the costs of the respective marginal unskilled investor and skilled non-investor at a local point λ_t. The model with r discrete cost types can then be used to approximate a model with a continuous distribution of talents (Mookherjee & Napel, 2007).

The economy produces a single consumption good with a Cobb–Douglas production function $H = \lambda_t^{\gamma}(1-\lambda_t)^{1-\gamma}$ with $\gamma \in (0, 1)$. Wages are given by the marginal productivities. Thus, in equilibrium, wages are

$$w_t^s \equiv \gamma\left(\frac{1-\lambda_t}{\lambda_t}\right)^{1-\gamma} \tag{1}$$

and

$$w_t^n \equiv (1-\gamma)\left(\frac{\lambda_t}{1-\lambda_t}\right)^{\gamma}. \tag{2}$$

[4] Galor and Zeira (1993) and Mookherjee and Ray (2003) find equal and unequal SSs.

[5] While Mookherjee and Napel (2007) assume that talent is independently and identically distributed, Napel and Schneider (2008) show that the results are robust if the child's talent depends on the talent of the parent. Maoz and Moav (1999) focus on the qualitative features of the convergency process that leads to a steady state. They also find that redistributive policy has a negative effect on growth in developed economies but a positive effect in developing countries.

[6] Here, 'talent' should be perceived as 'potential to benefit from education' as, e.g., in De Fraja (2005).