



Full length article

Who should pay an insurance premium for equality of the newborn's opportunity?[☆]

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ABSTRACT

In this paper, we develop a three-period model that incorporates parents' heterogeneous skills and social preferences. Our study shows how the optimal tax system is affected by the weight attached to the newborn child by a social planner. We obtain an unacceptable outcome for the current generation. That is, a high planner's weighting on the newborn's welfare makes the optimal capital income tax rate more regressive. In addition, the total tax burden of the highest-productivity parent is decreasing with the planner's weight. Thus, a low-productivity parent incurs a larger share of parents' welfare loss. This result follows from the trade-off between incentives for high-productivity parents and insurance for the newborn child.

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1. Introduction

Reducing inequality is an important topic for researchers and a worthy objective for policy makers. In particular, society is responsible for protecting the living standards of newborn children.

Some countries face considerable generational imbalances. Auerbach et al. (1999) measure such imbalances in 23 countries around the world by using a method called generational accounting which assesses the sustainability of fiscal policy. They conclude that future generations of several countries, such as the US, Japan, German, Italy, and Norway, face net tax rates that are at least more than 50% higher than those facing current generations. In addition, we should also consider the intragenerational inequality for newborn children because they cannot choose their parents and this uncertainty is a high risk for them. Although fiscal policy can be used to reduce these inequalities, this may adversely affect the current generation. The purpose of this paper is to design an optimal mechanism for the "current generation" that can be implemented by a social planner who attaches importance to newborns' welfare, in the belief that the present level of consideration for future generations is not sufficient. Although there are many ways of developing such a policy, the mechanism we use is based on optimal tax theory, known as "New Dynamic Public Finance".

This theory is a dynamic extension of the seminal work by Mirrlees (1971), who studies optimal taxation in an economy where there are heterogeneous agents whose skills involve private information. In this framework, agents' skills involve private information that is allowed to follow arbitrary stochastic processes. Golosov et al. (2003) show that the intertemporal optimality condition is distorted as agents are discouraged from saving. This means that agents' marginal benefits of

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investing in capital exceed the marginal costs of doing so under the constraint of efficient allocation. This optimality condition is known as the inverse Euler equation or reciprocal Euler equation, and the associated distortion is termed the capital wedge. Golosov et al. (2006) develop a two-period model that incorporates this wedge. The wedge is consistent with a tax on capital income. Kocherlakota (2005) and Albanesi and Sleet (2010) design tax policies that implement the constrained efficient allocation. Kocherlakota (2005) shows that the optimal capital income tax is regressive.

This framework is also useful for analyzing how to design a tax system in the presence of intergenerational trade-offs. Farhi and Werning (2007) develop a social discounting model in which intergenerational inequality is analyzed. Their study is extended by Farhi and Werning (2010), who analyze insurance for a newborn child. The planner solves a Pareto problem in which the average utility of the newborn child must exceed a certain level. They show that the intertemporal optimality condition has a wedge that encourages each agent to leave a bequest. They term this wedge an implicit estate tax. This wedge is consistent with a negative estate tax; i.e., a subsidy on bequests. Moreover, Farhi and Werning confirm that the implicit estate tax should be progressive, so that parents leaving larger bequests earn lower net returns on their bequests. By incorporating agents' skills that follow arbitrary stochastic processes, their model exhibits the discouraged savings problem. However, the relationship between the capital wedge and the implicit estate tax is not made clear. It is an open question how the weight attached to the newborn child by the planner affects the capital wedge and the optimal tax system that is designed to deliver the constrained efficient allocation.

In this paper, we develop a three-period model that combines the concepts of Golosov et al. (2006) and Farhi and Werning (2010). The setup makes it possible to analyze the relationship between the attained level of the newborn's welfare and the parents' behavior. This is because the capital wedge and the implicit estate tax emerge separately from the model. We first consider the planner's problem with social preferences. The planner maximizes the weighted sum of the parents' welfare and the newborn's welfare. The maximization problem the planner faces is similar to that considered in Farhi and Werning (2010). In Section 3, we provide a theoretical result of this model. We show how the optimal conditions are related to the former studies. Then, by following the approach suggested by Kocherlakota (2005, 2010), we attempt to design an explicit tax system that generates the constrained efficient allocation.

We also conduct a numerical analysis that shows how the weight attached to the newborn child by the planner affects the constrained efficient allocation and the optimal tax system. There are three main findings. First, a high planner's weight on the newborn's welfare makes the optimal capital tax rates more regressive. This means that the planner must strengthen the incentive to work for high-productivity parents. Second, the total tax burden of the most highly skilled parent is decreasing in the planner's weight on the newborn's welfare. Third, a less-skilled parent incurs a larger share of the parents' welfare loss. These results indicate that the planner's additional treatment for the newborn causes an increase in the intragenerational inequality of the current generation. Policy makers may worry about these results because they may face strong resistance to them.

2. A three-period economy

2.1. Preferences

A continuum of parents live in periods $t = 0$ and $t = 1$. Each parent produces a single child who lives in period $t = 2$.¹ Parents work and consume in each period, whereas their children only consume. At the beginning of periods $t = 0$ and $t = 1$, parents obtain their productivity or skill level, θ_t , which is private information. They then produce y_t units of the consumption good, which requires y_t/θ_t units of work effort in $t = 0, 1$. Let the productivity realization in period 0 be $\theta_0(i)$ for $i = 1, 2, \dots, N_0$. Let $\pi_0(i)$ denote the ex ante probability distribution, which, by the law of large numbers, is equivalent to the ex post distribution in the population. In period 1, productivity becomes $\theta_1(i, j)$ for $j = 1, 2, \dots, N_1(i)$, where $\pi_1(j|i)$ is the conditional probability distribution for parents of skill type j , whose skill type in period 0 is given by i . We assume that the probability distribution of productivity, π , is common knowledge. The utility function $u(\cdot)$ is increasing, concave, differentiable and satisfies Inada's conditions; the disutility function $h(\cdot)$ is increasing, convex and differentiable. In the rest of this paper, we write $c_0(\theta_0(i))$, $c_1(\theta_0(i), \theta_1(i, j))$, $c_2(\theta_0(i), \theta_1(i, j))$, $y_0(\theta_0(i))$, $y_1(\theta_0(i), \theta_1(i, j))$ as $c_0(i)$, $c_1(i, j)$, $c_2(i, j)$, $y_0(i)$, $y_1(i, j)$, respectively. Then, the parents' welfare is given by:

$$V^P \equiv E \left[u(c_0(i)) - h \left(\frac{y_0(i)}{\theta_0(i)} \right) + \beta \left\{ u(c_1(i, j)) - h \left(\frac{y_1(i, j)}{\theta_1(i, j)} \right) \right\} + \gamma u(c_2(i, j)) \right],$$

with $\beta < 1$ and $\gamma < 1$. β is a discount factor for parents and γ is a degree of their altruism in caring for their child's utility. $V^C(\cdot)$ is the newborn's welfare and it is

$$V^C \equiv E[u(c_2(i, j))].$$

¹ It does not mean that there are two parents and one newborn. We treat them as the same size.

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