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Estate tax and lifetime income inequality

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ABSTRACT

This paper constructs a heterogeneous, intertemporal general equilibrium framework which integrates both intended and unintended bequest motives to examine the long-run effects of an estate tax on the inequality of lifetime income. The results are ambiguous in general and sensitive to the type of transfer motive involved. We find that in the purely intended bequest case, an estate tax increases the steady-state inequality of net lifetime income in the case where people's elasticity of intertemporal substitution is greater than one. However, in the purely unintended bequest case, the effect of an estate tax on inequality is dependent on the probability of survival.

1. Introduction

The subject of an estate and gift tax has been controversial for a very long time. Even today, some people propose to reduce or even abolish the taxation, while others suggest expanding and increasing it. Indeed, bequest and inheritance are potentially important factors responsible for income inequality and economic welfare. The proponents of estate and gift taxation advocate that the imposition can mitigate the unfairness of inheritance and thus the inequality of lifetime income. As Gale and Slemrod (2001) claimed, estate and gift taxes are originally viewed as a counterweight to an undue concentration of wealth.

The literature has examined the impacts of bequest and the redistribution effect of estate taxation mostly under a specific assumption about the types of bequest motive. For example, Becker and Tomes (1979) and Tomes (1981) supported the altruist motive and showed that intergenerational transfers affect the regression to the mean in earnings. In a neoclassical, general equilibrium model with altruistic agents, Laitner (2001) simulated the redistribution effect of the taxation and found that eliminating the U.S. estate and gift tax increases the inequality of long-run wealth distribution.

Except for an intentional motive like altruism, the literature has also considered unintentional bequest motive. Each possible motive gains support from some empirical research studies. For example, Hurd (1987) compared the wealth difference between old families with children and without children, reaching a conclusion that most bequests are accidental. By contrast, Menchick and David (1983) and Bernheim (1991) reported that bequests are intentional. Of the intentional motives, Altonji et al. (1997) and Laitner and Ohlsson (2001) demonstrated that intergenerational transfers are partially motivated by altruism.

Different motives for intergenerational transfer lead to different implications for public policy. As Gale and Perozek (2001) showed, the effects of an estate and gift tax on savings depend in a significant way on transfer motives. Therefore, we believe that transfer motives also play a crucial role in the redistribution effects of an estate and gift tax. Unfortunately, neither motive passed through all tests of previous research studies. The motives for some households to transfer resources across generations may actually be mixed. Accordingly, it is essential and desirable to develop a systematic and unified framework allowing for both intended and unintended bequests in order to assess the redistribution effects of an estate and gift tax.

This study adopts the general equilibrium approach. As shown by Gale and Perozek (2001), an estate tax definitely affects savings. Once the tax reduces savings and capital accumulation in an economy, the prices of production factors change further. This means that the imposition of an estate tax on the one hand changes the intergenerational transfer of wealth, and on the other hand changes the path of capital accumulation and thus the shares of factor income. Both changes in turn affect the steady-state income inequality. Therefore, ignoring the impacts on factor prices in the long run may produce misleading results of a policy's evaluation. This is the reason why Stiglitz (1978) argued that the general equilibrium effects should be taken into account.

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For many countries, there is another important tax in place: the income tax. In the literature the appropriate roles of these two taxes are contentious. For example, Gale and Slemrod (2001) claimed that an estate tax serves as a backstop to the income tax, taxing the income sources which leak out from the income tax. Kaplow (2001) suggested that the income tax should take the major responsibility of redistribution. Cremer and Pestieau (2001) pointed out that under an altruistic model, a well-designed estate tax from a normative standpoint has its role in redistribution. This paper integrates the income tax and estate tax in a framework to investigate and distinguish their effects.

In a heterogeneous, overlapping, general equilibrium model, we find that a proportional estate tax has a redistribution effect in the long run, while a proportional income tax has no influence in the inequality of steady-state distribution. In particular, when people are altruistic in the case of certainty, estate taxation definitely increases the inequality of steady-state income, if people's intertemporal substitution is elastic. This undesirable result obviously contradicts the common recognition.

This paper is organized as follows. Section 2 presents the model which consists of an individual's behaviors of savings and intergenerational transfers, and the production side of the economy as well. The steady state is solved further. Section 3 analyzes the welfare effects of an estate tax and income tax, respectively. Numerical simulations are carried out to obtain more insight. Section 4 contains conclusions.

2. The model

This section provides a heterogeneous, overlapping, and general equilibrium framework for assessing an estate and gift taxation. For abbreviation, the tax is called an estate tax in the following. On the part of intergenerational transfers, a hybrid of accidental and altruistic bequests is considered and modeled. The government exists for the sake of the provision of public goods. Following Caballé (1995), public goods are assumed either not to affect an individual's utility or to generate utility in an additive form. To finance public expenditure, the government levies a tax on labor income and interest income and a tax on inheritance. Both taxes are proportional.

2.1. Individual's decision problem

Consider an overlapping generations economy with no population growth. Each individual may live two economically active periods: a working period followed by a retirement period if alive. An individual lives to the second period with probability p, which is identical for every generation. Facing the incompleteness of an annuity market, savings must be positive. In the first period, each individual works and gives birth to one offspring. Every individual inelastically supplies one unit of labor. However, individuals are heterogeneous in earning ability. Preferences are assumed to be identical.

An individual of generation t is indexed by ability a_t, where a_t is assumed to have identical and independent uniform distribution, with $a_t \in [0,1]$. In the first period, a worker earns labor income, which is equal to $a_t w_t$, where w_t is the wage per efficiency unit of labor.

Assume that a parent is altruistic and cares about his child's consumption possibilities (see Laitner and Ohlsson (2001)). A parent is fully informed about his child's earning ability and has perfect foresight about the future wage rate and interest rate. For ease of manipulation, the utility function is restricted to the Bergson's class. Thus a tth-generation parent's preference is represented by:

$$\frac{c_{1t}^{1-\gamma}}{1-\gamma} + p\frac{c_{2t}^{1-\gamma}}{1-\gamma} + p\theta\frac{(y_{t+1}^*)^{1-\gamma}}{1-\gamma} + (1-p)\theta\frac{(z_{t+1}^*)^{1-\gamma}}{1-\gamma}, \tag{1}$$

where c_{1t} and c_{2t} are respectively the parent's consumptions for periods 1 and 2. If a parent survives to the second period, then his child receives purely intended bequests and has after-tax lifetime income y_{t+1}^*; otherwise his child receives both intended and unintended bequests and has after-tax lifetime income z_{t+1}^*. Term θ is a parameter representing the degree of a parent's altruism. When $\theta = 0$, a parent is described as selfish and the bequests he leaves is purely unintended. For simplicity, the time discount factor is assumed to be 1.

An altruistic parent maximizes his lifetime utility subject to a set of budget constraints as follows:

$$c_{1t} = y_t^* - s_t, \tag{2}$$

$$c_{2t} = r_{t+1}^* s_t - b_t, \tag{3}$$

$$y_{t+1}^* = (1-\tau_b)b_t + a_{t+1}w_{t+1}^*, \tag{4}$$

$$z_{t+1}^* = (1-\tau_b)r_{t+1}^* s_t + a_{t+1}w_{t+1}^*, \tag{5}$$

$$s_t > 0, \tag{6}$$

$$b_t \geq 0, \tag{7}$$

where s_t is savings, b_t is a purely intended bequest, r_{t+1}^* is the after-tax gross rate of return on savings, and w_t^* is the after-tax wage rate. Let τ and τ_b denote the income tax rate and estate tax rate, respectively. Thus, $r_{t+1}^* = (1-\tau)r_{t+1}$, and $w_t^* = (1-\tau)w_t$, where r_{t+1} is the gross rate of return on savings.

The first-order conditions yield the optimal consumption patterns of the parent and the amount of the bequest as follows:

$$c_{1t} = \alpha_{1t}\left[y_t^* + \frac{a_{t+1}w_{t+1}^*}{(1-\tau_b)r_{t+1}^*}\right], \tag{8}$$

$$c_{2t} = \alpha_{2t}r_{t+1}^*\left[y_t^* + \frac{a_{t+1}w_{t+1}^*}{(1-\tau_b)r_{t+1}^*}\right], \tag{9}$$

$$b_t = \alpha_{3t}r_{t+1}^*\left[y_t^* - \frac{\alpha_{1t}+\alpha_{2t}}{\alpha_{3t}(1-\tau_b)r_{t+1}^*}a_{t+1}w_{t+1}^*\right]. \tag{10}$$

A parent's consumption and bequests to his child all depend on his own lifetime wealth and his child's earnings as well. If his child's earning ability or the net wage rate is higher, then the parent will reduce the pre-tax giving, while keeping more resources for himself to consume. The proportions, αs, are derived as:

$$\alpha_{1t} = \frac{r_{t+1}^*}{r_{t+1}^* + [p(1+\theta^{1/\gamma}(1-\tau_b)^{1-\gamma/\gamma})^\gamma + (1-p)\theta(1-\tau_b)^{1-\gamma}]^{1/\gamma}(r_{t+1}^*)^{1/\gamma}}, \tag{11}$$

$$\alpha_{2t} = \frac{[p(1+\theta^{1/\gamma}(1-\tau_b)^{1-\gamma/\gamma})^\gamma + (1-p)\theta(1-\tau_b)^{1-\gamma}]^{1/\gamma}(r_{t+1}^*)^{1/\gamma}}{r_{t+1}^* + [p(1+\theta^{1/\gamma}(1-\tau_b)^{1-\gamma/\gamma})^\gamma + (1-p)\theta(1-\tau_b)^{1-\gamma}]^{1/\gamma}(r_{t+1}^*)^{1/\gamma}} \times \frac{1}{1+\theta^{1/\gamma}(1-\tau_b)^{1-\gamma/\gamma}}, \tag{12}$$

$$\alpha_{3t} = \frac{[p(1+\theta^{1/\gamma}(1-\tau_b)^{1-\gamma/\gamma})^\gamma + (1-p)\theta(1-\tau_b)^{1-\gamma}]^{1/\gamma}(r_{t+1}^*)^{1/\gamma}}{r_{t+1}^* + [p(1+\theta^{1/\gamma}(1-\tau_b)^{1-\gamma/\gamma})^\gamma + (1-p)\theta(1-\tau_b)^{1-\gamma}]^{1/\gamma}(r_{t+1}^*)^{1/\gamma}} \times \frac{\theta^{1/\gamma}(1-\tau_b)^{1-\gamma/\gamma}}{1+\theta^{1/\gamma}(1-\tau_b)^{1-\gamma/\gamma}}, \tag{13}$$

where $\alpha_{1t}+\alpha_{2t}+\alpha_{3t}=1$.

It is explicit that in general the proportion of consumption in each period and the transfer proportion both depend on income tax and estate tax. Given the interest rate, savings and bequests strictly decrease in the income tax rate if and only if the elasticity of