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The object of tax reform is to create a more efficient tax system, which promotes efficiency, growth, a better distribution of income, and increases revenues. In spite of many notable achievements of recent economic studies with respect to land taxes, little has been done to examine the effects of the inheritance tax and the capital gains tax on land use. The purpose of this paper is to propose a combination of “a new realized capital gains tax at the time of death” and “a deemed realization-based capital gains tax” on land. Using a simple model, we show that our new method of capital gains taxation system promotes the efficient land use and improves equity.

Key word : a new realized capital gains tax at the time of death, a deemed realization-based capital gains tax, a lock-in effect

* I am greatly honored to have the opportunity to write a paper for Commemoration Number for prof. Kenji Okano.

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1. Introduction

Capital gains on land can be taxed either at accrual or realization. We call the former method unrealized capital gains taxation on land and call the latter method realized capital gains taxation on land. The former method is preferable from a fairness point of view. Nevertheless, most countries have opted for a realization-based capital gains tax on land. Perhaps significant arguments against unrealized capital gains taxation on land are that unrealized capital gains taxation on land makes it necessary to evaluate unrealized capital gains on land and that it would be extremely difficult to evaluate the unrealized increment of land value. Like many other countries, Japan also has adopted a realization-based capital gains tax on land (a realized capital gains tax on land).

However, a realized capital gains tax on land causes serious problems. The most frequently discussed problem arising from a realized capital gains tax on land is the lock-in effect, the desire to hold appreciated land in order to defer taxes on capital gains already accrued, resulting in a distorted allocation of land and inefficient portfolio selection. It has been verified that the lock-in effect is large when previously accrued capital gains are large and that it causes an increase in land prices. From the beginning of 1955 to the end of 1991, land prices in Japanese urban areas had grown at an annual rate of around 20%, in particular, in the late 1980s, land prices grew extraordinary.

In order to neutralize the lock-in effect on land, the devices of capital gains taxation were proposed by Auerbach (1991), Iwata (1977), and Iwata and Hatta (2003). From a practical point of view, “a realized capital gains tax at the time of death” proposed by Iwata and Hatta (2003) was one of the most interesting devices. However, the device proposed by Iwata and Hatta (2003) suffers from limitations. As “a realized capital gains tax at the time of death” is a system that approves of

deferring the payment of the capital gains tax on residential property (land) with no interest until death, it is not neutral regarding land sale if the projected time of the landowner and that of the buyer are different. Aono (2006) presented a new method of realized capital gains taxation called “a new realized capital gains tax at the time of death”. “A new realized capital gains tax at the time of death” is a tax imposing a higher tax rate on gains held for longer periods of time, it can eliminate the lock-in effect of the realized capital gains tax, and can also make it possible for an elderly person to allocate the funds from selling the real estate to retirement living funds.

Under the Japanese inheritance tax system, the basis of the appreciated land value is the acquisition value of the decedents. Thus, when the heirs sell the decedents’ land which come to them by inheritance, gains accrued by the decedents are subject to the capital gains tax. However, when the heirs do not sell the land which they succeed to, the capital gains tax is not imposed on the heirs. Therefore, by postponing realization until death, the capital gains tax on land could be avoided entirely. Since most of the asset-holders (land owners) who own a large amount of land in urban areas contemplate the after-tax wealth to be bequeathed to their heirs, not only does this preferential treatment of capital gains on land impede the efficient land development, but also it increases inequalities of income distribution by inheritance.

The purpose of this paper is to propose a combination of “a new realized capital gains tax at the time of death” and “a deemed realization-based capital gains tax” on land, and doing so, promote the efficient land use, and improve equity. For this purpose we examine the effects of a new method of capital gains taxation system on land use. We show that our method promotes efficiency and improves equity.

The structure of this paper is as follows. Section 2 presents the basic assumptions and explains how “a new realized capital gains tax at the time of death”

and “a deemed realization-based capital gains tax” on land are incorporated into our model. We further derive basic equations, and examine the effects of a combination of “a new realized capital gains tax at the time of death” and “a deemed realization-based capital gains tax” on land use. Section 3 summarizes our findings and discusses their policy implications.

2. Proposal for a combination of “a new realized capital gains tax at the time of death” and “a deemed realization-based capital gains tax” on land

1) Basic Assumptions

The basic assumptions are as follows :

Assumption 1 : Landowners bequeath all of their land to their heirs. When parents wish to bequeath wealth to their children, they have the choice to sell the land and buy other monetary assets before they die, or to hold their land until death. Our assumption implies that they choose to hold their land until death.

Assumption 2 : There is a competitive asset market for land ; on the other hand, there is no rental market for land. Land is converted from old uses to new uses only when the land is sold to the land purchaser. There exists the law of diminishing returns. For simplicity, the land purchaser can change the land use without development costs and land servicing costs.

Assumption 3 : For analytical simplicity, there exist only two kinds of assets ; land and other monetary assets. These two assets have the same risk properties under the assumption of a perfect land asset market.

Assumption 4 : A combination of “a new capital gains tax at the time of death” and “a deemed realization-based capital gains tax” on land is introduced at the time of inheritance (at time 0). Under a new method of capital gains taxation system, when landowners (decedents) choose to hold their land until death and bequeath all

of their land to their heirs, they are considered to sell the land at the time of their death, and “a deemed realization-based capital gains tax” is imposed on the decedents. Since landowners (decedents) are considered to sell the land at the time of their death, the assessed value of land is the market value of land. From a legal point of view, “a deemed realization-based capital gains tax” should be imposed on the decedents, but, from a practical point of view, it is impossible to impose a capital gains tax on the dead. Hence, this capital gains tax and the inheritance tax are imposed on the heirs simultaneously. It should be noted that since “a deemed realization-based capital gains tax” is the tax which should be imposed on the decedents, the heirs cannot avoid this capital gains tax by selling the land in lots.

Assumption 5: For simplicity, we assume the existence of only two taxes; the inheritance tax and a combination of “a new capital gains tax at the time of death” and “a deemed realization-based capital gains tax” on land.

Assumption 6: When “a deemed realization-based capital gains tax” is imposed on the heir’s land, the assessed value of land is the market value of land. On the other hand, when the inheritance tax is imposed on the heir’s land, the assessed value is less than the market value. The ratio of this assessed value to the market value of land is indicated by $\beta (< 1)$.

Assumption 7: Regarding landownership, we assume that there exist two groups in the society. One group is the landowners who own a large amount of their land for long periods of time, and earns a lot of unrealized capital gains on land. The other group has no land, therefore, has to buy a small amount of land. This assumption implies that if a tax on unrealized capital gains decreases the price of land and promotes the conversion of land from the old use to the new use, not only does unrealized capital gains taxation promote efficiency, but also it improves equity (see assumption 2).

2) A Deemed Realization-Based Capital Gains Tax

In order to introduce “a new realized capital gains tax at the time of death”, it is crucially important to adopt “a deemed realization-based capital gains tax” on land. “A deemed realization-based capital gains tax” on land is defined as the unrealized capital gains tax on land which is imposed on the heirs when the heirs inherit the land from the decedents. A deemed realization-based capital gains tax is a kind of unrealized capital gains taxation. There are significant arguments against unrealized capital gains taxation. We will discuss two problems relating to this kind of taxation.

Some critics claim that it constitutes double taxation. From a legal point of view, it is not illegal to impose the unrealized capital gains tax on land. For instance, if all of the heirs choose limited consent (*gentei-syonin*) which means to be able to accept debts with a limitation up to the value of the assets, all of the heirs together have to pay the unrealized capital gains tax on land as long as the land value of the decedents at the time of their death exceeds the acquisition land value of the decedents. This unrealized capital gains tax on land is called “a deemed realization-based capital gains tax” on land. Our proposal is to make it possible to impose “a deemed realization-based capital gains tax” on land on a broad scale.

The second arguments against this tax are that the unrealized capital gains on land are hard to value and that taxation on unrealized capital gains taxation would increase the compliance costs of tax payers. Perhaps the above arguments are the most significant arguments against adopting an annual tax on the land’s accrued gains, but, our proposal is not unjustified by the above arguments. The concern of tax payers is not evaluation of their land, but the difference of the tax caused by the difference of evaluation of their land.

Our proposal can mitigate the above problems relating to the unrealized capital gains tax on land in the following ways :

- ① “A deemed realization-based capital gains tax” is deducted from the inheritance tax.
- ② When the heirs sell the land of their decedents within 3 years after the decedents’ death, and if the sales price of land is less than the evaluated value of land at the time of their death, that is, if there has been overpayment, it has to be returned.
- ③ When the heirs sell the decedents’ land, and if the sales price of land exceeds the evaluated value of land at the time of the decedents’ death, under a new method of capital gains taxation system, the acquisition land value of the heirs is considered to be the evaluated value of land at the time of the decedents’ death. Besides, the heirs can postpone paying the capital gains tax on land until death.

As we discussed earlier, under the Japanese inheritance tax system, when the heirs do not sell the land owned by the decedents, the capital gains tax is not imposed on the heirs. Therefore, by postponing realization until death, the capital gains earned during a life time entirely untaxed. Since we assume that asset-holders (landowners) contemplate the after-tax wealth to be bequeathed to their heirs, without “a deemed realization-based capital gains tax” on land, “a new realized capital gains tax at the time of death” does not work well and cannot eliminate the lock-in effect on land. This is one of the main reasons why it is crucially important to adopt “a deemed realization-based capital gains tax” on land on a broad scale.

3) Derivation of the Basic Equations

We shall now derive the basic equations which examine the effects of a combination of a new realized capital gains tax at the time of death and a deemed realization-based capital gains tax on land use.

Now let us explain how a new method of capital gains taxation system works. For simplicity, We assume that “a new realized capital gains tax at the time of death” on land is introduced at time 0 (at the time of inheritance), and we denote

the capital gains tax rate at time 0 as θ_0 . At the same time, we decide on setting the nominal capital gains tax rate at time T , and denote it as θ_T . θ_T is the base capital gains tax rate when we introduce a new method of capital gains taxation at time 0. Relations between θ_0 and θ_T are indicated by $\theta_T = \theta_0(1+r)^T$, where r is the rate of interest. From time 0 to time T , the nominal capital gains tax rate increases at an annual rate of $r\%$. If the landowner (the heir) dies at time S , and $S < T$, the capital gains tax rate at time S is indicated by $\theta_S = \theta_0(1+r)^S$. The notation θ_0 , θ_S and θ_T need to satisfy $\theta_0 \leq \theta_T(1+r)^{S-T} < \theta_T$. If the landowner dies at time S , and $S \geq T$, then, as long as the following condition is satisfied, that is, in the case where the landowner dies within J years after he sells the land or the land purchaser dies within J years after he buys the land, the capital gains tax rate $\theta_T - \alpha$ is imposed on the landowner or on the land purchaser. In other cases, the capital gains tax rate θ_T is imposed.

Relations between $\alpha\%$ and J years are as follows. Regarding the nominal capital gains tax rate θ_T , we set $\theta_T/(1+r)^X = \theta$, and, calculate X . X needs to satisfy the equation $\theta_T - \alpha = \theta_T/(1+r)^{X-J}$.¹⁾

We assume that the heir expects to die at time S , and $T < S \leq J$, that is, he expects to live longer than T , but, expects to die within J years after he sells the land (when the heir expects to live more than J years ($S > J$), $\alpha = 0$, that is, the capital gains tax rate, θ_T is imposed). It should be noted that whether he really dies at time S or not does not alter our conclusion.

We shall now examine the behavior of the heir who has inherited the land from his decedents. We assume that the heir has to choose whether he should sell the land at the time of inheritance (at time 0), or he should sell the land the next year

1) For detail analysis and explanation for relations between $\alpha\%$ and J years, see Aono (2006). Table 1 illustrates between $\alpha\%$ and J years for given interest rates and capital gains tax rate. Table 2 illustrates the effects of $\alpha\%$ capital gains deduction on holding-period neutrality. See Aono (2006) pp. 62-64.

according to the net value of his land at time 0. In the case where the heir chooses to sell the land the next year (at time 1), the net value of his land at time 0 is indicated as follows :

$$V_1 = -\theta_0(P_0 - R) - \gamma\{\beta P_0 - \theta_0(P_0 - R)\} + \frac{\rho_0^A}{(1+r)} + \frac{P_1}{(1+r)} \frac{(\theta_T - \alpha)(P_1 - P_0)}{(1+r)^S}, \quad (1)$$

where R is the acquisition cost of the decedents, γ is the inheritance tax rate, β is the ratio of assessment value to the market value of land assumed to be less than unity, ρ_0^A is the imputed rent of the heir at the end of 0 period, P_1 is the expected price of land at time 1, respectively. The equation (1) is explained as follows. $\theta_0(P_0 - R)$ is the capital gains tax imposed on “a deemed realization-based capital gains” on land, $\gamma\{\beta P_0 - \theta(P_0 - R)\}$ is the effective inheritance tax, and $(\theta_T - \alpha)(P_1 - P_0)/(1+r)^S$ is the present value of the capital gains tax imposed on the heir when he sells the land at time 1, and expects to die at time S . Thus, the right-hand side of (1) represents the net value of the heir’s land at time 0 when he sells the land the next year (at time 1).

On the other hand, if the heir chooses to sell the land at the time of inheritance (at time 0), the net value of his land at time 0 is indicated as follows :

$$V_2 = P_0 - \theta_0(P_0 - R) - \gamma\{\beta P_0 - \theta_0(P_0 - R)\} \quad (2)$$

The equation (2) is explained as follows. The heir who inherits the decedents’ land has to pay the capital gains tax imposed on “a deemed realization-based capital gains” on land, $\theta_0(P_0 - R)$, and the effective inheritance tax $\gamma\{\beta P_0 - \theta(P_0 - R)\}$, but, he does not have to pay “a capital gains tax at the time of death”. Thus, the right-hand side of (2) represents the net value of the heir’s land at time 0 when he sells the land at the time of inheritance (at time 0).

From a comparison of (1) and (2), the condition of making the present value by

selling the land at the time of inheritance (at time 0) equivalent to the present value by selling the land the next year (at time 1), that is, the condition of making (1) = (2) is indicated by the following equation :

$$\rho_0^A + P_1 - P_0 - \frac{(\theta_T - \alpha)(P_1 - P_0)}{(1+r)^{S-1}} = rP_0 \quad (3)$$

In the case where the landowner (the heir) expects to die at time S , and if $S < T$, it is easily verified that the condition of making the present value by selling the land at the time of inheritance equivalent to the present value by selling the land the next year is indicated by the following equation :

$$\rho_0^A + P_1 - P_0 - \frac{\theta_T(P_1 - P_0)}{(1+r)^{T-1}} = rP_0. \quad (3)'$$

From (3) and (3)', we see that inheritance tax and a lower assessed land value in inheritance taxation have no effects on the behavior of the heir.

Now, we shall examine the behavior of a land purchaser. We assume that a land purchaser expects to die at time W , and $T < W \leq J$, (when a land purchaser expects to live more than J years ($W > J$), $\alpha = 0$, that is, the capital gains tax rate θ_T is imposed). By the similar procedure of deriving (3), the condition of making the present value by purchasing the land at time 0 (this year) equivalent to the present value by purchasing the land the next year is indicated by the following equation :

$$\rho_0^H + P_1 - P_0 - \frac{(\theta_T - \alpha)(P_1 - P_0)}{(1+r)^{W-1}} = rP_0, \quad (4)$$

where ρ_0^H is imputed rent of a land purchaser at the end of 0 period. In the case where a land purchaser expects to die at time W , and $W < T$, it is easily verified that the condition of making the present value by purchasing the land at time 0 (this year) equivalent to the present value by purchasing the land at time 1 (the next year) is indicated by the following equation :

$$\rho_0^H + P_1 - P_0 - \frac{\theta_T (P_1 - P_0)}{(1+r)^{T-1}} = rP_0. \quad (4)$$

If we substitute (3) into (4), when the increase in land prices is expected, the condition of equalizing the present value by selling (purchasing) the land at the time of inheritance (at time 0) to the present value by selling (purchasing) the land the next year (at time 1) is indicated by the following equation :

$$\rho_0^H + \rho_0^A = \frac{(\theta_T - \alpha)(P_1 - P_0)}{(1+r)^{W-1}} - \frac{(\theta_T - \alpha)(P_1 - P_0)}{(1+r)^{S-1}}. \quad (5)$$

Similarly, substituting (3) into (4), we obtain the following equation :

$$\rho_0^H - \rho_0^A = \frac{\theta_T (P_1 - P_0)}{(1+r)^{T-1}} - \frac{\theta_T (P_1 - P_0)}{(1+r)^{T-1}} = 0. \quad (5')$$

In the case where $T < S \leq J$, and $W \leq J$, (5) holds. In the case where $S < T$, and $W < T$, (5') holds. It is assumed that land purchasers can develop land to the residential use without developing cost. This assumption enables us to set the selling price equal to the purchasing price. It is also assumed that there exists the law of diminishing returns.

Equation (5) and (5') are interpreted as follows. Since we assume that there is no developing cost, if the capital gains tax is zero, that is, if $\theta_T = 0$, and $\alpha = 0$, then, $\rho_0^H = \rho_0^A$. This implies that if there is no capital gains tax on land, and the increase in land prices is expected, the present value by selling (purchasing) the land at the time of inheritance (at time 0) is equal to the present value by selling (purchasing) the land the next year (at time 1). Under the assumption of the law of diminishing returns, if the introduction of the capital gains tax causes $\rho_0^H > \rho_0^A$, it means that the landowner continues to use the land of a lower marginal productivity. Thus, a new method of capital gains taxation impedes the new land use. If $\rho_0^H < \rho_0^A$, a new method of capital gains taxation system promotes the new land use. If $\rho_0^H = \rho_0^A$, a new method of capital gains taxation system achieves holding-period-

neutrality. It should be noted that (5) and (5)' do not contain the acquisition cost of land, R . It means that a new method of capital gains taxation system does not depend upon the acquisition cost of decedents' land.

It is of sufficient economic interest to pursue the implications of (5) and (5)'. We can derive the following implications from (5) and (5)' :

① Under a method of a new capital gains taxation system, the acquisition cost of the decedents, R has no effects on land use. This is because the heir who inherits the decedents' land has to pay "a deemed realization-based capital gains tax" on land, $\theta_0(P_0 - R)$. His acquisition cost of land is not R , but P_0 (the land price at time 0).

② When both landowners and land purchasers expect to live shorter than T years ($S < T, W < T$), a new method of capital gains taxation achieves holding-period-neutrality ($\rho_0^H = \rho_0^A$).

③ When both landowners and land purchasers expect to live longer than T years ($S > T, W > T$), and land purchasers expect to live longer than landowners ($W > S > T$), a new method of capital gains taxation promotes the new land use. In the case where landowners expect to live longer than land purchasers ($S > W > T$), a new method of capital gains taxation impedes the new land use. However, by setting $\alpha\%$ and J year properly, a new method of capital gains taxation can mitigate the inefficient land use.

④ Under the Japanese inheritance taxation system, when the heir sells the land for the purpose of paying the inheritance tax at the time of inheritance, the inheritance tax is deducted from the realized capital gains tax. Denoting the inheritance tax rate as γ_A , this deduction system is indicated by $\theta_0(P_0 - R - \gamma_A P_0)$. This deduction system has the following problems. First, it induces landowners (decedents) to hold their land until death and bequeath all of their land to their heirs. Second, under this deduction system, the realized capital gains tax,

$\theta_0(P_0 - R - \gamma_A P_0)$ varies as the inheritance tax, $\gamma_A P_0$ varies. Since the inheritance tax is levied at progressive rates, this deduction system results in the preferential tax treatment of the realized capital gains tax, the benefits of which go disproportionately to the heirs who inherit a large amount of land.

A new method of capital gains taxation can mitigate the first problem, and eliminates the second problem.

3. Concluding Remarks

We have examined the effects of a combination of “a new realized capital gains tax at the time of death” and “a deemed realization-based capital gains tax” on land uses. As we have stated in section 1, the most frequently discussed problem arising from a realized capital gains tax on land is the lock-in effect, resulting in a distorted allocation of land and inefficient portfolio selection. It has been verified that the lock-in effect is large when previously accrued capital gains are large. In this paper we have showed that not only does a new method of capital gains taxation mitigate the lock-in effect and promote the efficient land use, but also it improves equity. In order to improve equity, it is crucially important to adopt “a deemed realization-based capital gains tax” on land on a broad scale.

Let us discuss the policy implications of this paper. The object of tax reform is to create a more efficient tax system, which simultaneously advances a variety of social goals: promoting efficiency, growth, a better distribution of income, and increasing revenues. As we have showed in this paper, a combination of “a new realized capital gains tax at the time of death” and “a deemed realization-based capital gains tax” on land can promote efficiency. In most cases capital gains on land are not the fruit of landowners’ efforts, but the unearned increment of the land value due to public investment. A new method of capital gains taxation can be used to reduce inequalities and contribute to a better distribution of income, and

increase revenues.

We hope that a proposal for a combination of “a new realized capital gains tax at the time of death” and “a deemed realization-based capital gains tax” on land will be examined in the real world.

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