Why wealth should not be taxed

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Abstract
Even if all the wealth in the economy was owned by one agent alone, with zero weight in the social welfare function, the accumulation of wealth should not be taxed. The workers lose by having the capital-rich pay taxes on the accumulation of capital. (JEL: E60, E61, E62)

Introduction

The wealth distribution in the U.S., and also in most of the developed world, has become increasingly more concentrated in the last fifty years, or so. After a long period, from the late twenties to the late seventies, in which wealth became more evenly distributed, that process was reversed in the last five decades. In particular, for the U.S., the top 0.01% of households own today roughly 10% of total net wealth, a figure that is as high as the high levels of the late twenties/early thirties (see Figure 1).[1]

Given the increasing concentration of wealth in the developed world, should wealth taxes be used to redistribute wealth back to the majority of households that have been made relatively poorer? Should the accumulation of capital be taxed, so that taxes on labor may be lowered? How should capital income be taxed relative to labor income?

Based on the work of Chari, Nicolini and Teles (2016) that builds on a large literature, it is shown again here in a simpler framework and using a wealth tax, that the accumulation of wealth should not be taxed. This is the case independently of how wealth and capital are distributed across the households in the model. Even if wealth was all concentrated in the hands of one agent, and this agent had zero weight in the welfare function, even in that case, the accumulation of wealth by that household should not be taxed. All households, rich and poor benefit from wealth accumulation not being taxed. The capital-rich benefit because they are not taxed directly; the workers are

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1. In Portugal, according to the Household Finance and Consumption Survey, in 2013, the top 1% of the population had 15% of total net wealth.

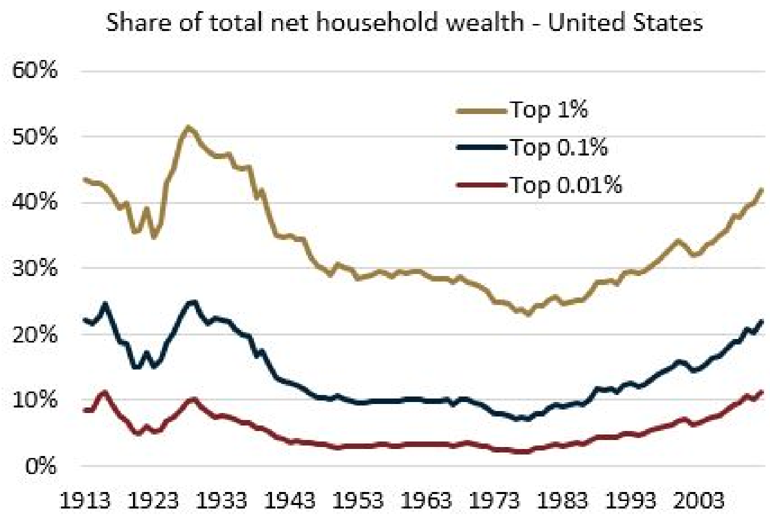

FIGURE 1: Share of total net household wealth - United States

Source: Saez and Zucman (2016)

taxed but their wages net of taxes are higher. The increase in labor income more than compensates the higher taxes.

We solve a simple optimal taxation problem with capital-rich and poor agents and taxes on labor income, wealth and capital income. The model is the standard neoclassical growth model with constant elasticity preferences. The main result is that the optimal taxes on the accumulation of wealth are zero. While the accumulation of wealth should not be taxed, a completely different matter is whether the initial wealth should be taxed. The initial wealth in the model is the one the households start with, today, when the policy change is being considered. Taxing today's wealth does not distort marginal decisions because the accumulation of today's wealth was decided in the past. It may be optimal to tax the initial wealth in order to transfer resources to the government and across households, depending on the distribution of wealth and on the social welfare function.

The main conclusion of this article is that the only tax on wealth that may be desirable in a standard macro model with capital-rich and poor agents is a confiscatory tax, never to be repeated. Now a tax that is levied, not to be repeated is a difficult tax to levy. Because if the tax is not to be repeated, how can it be levied in the first place? The initial confiscatory tax would be defrauding previous implicit promises or expectations. Otherwise there would be much less, possibly none, wealth to confiscate. There is a sense in which, if the government must confirm previous expectations of the returns on assets net of taxes, then, even in the initial period, wealth would not be taxed, because taxing it would imply defrauding those expectations (see Chari *et al.* (2016) for a discussion of this).

What is the reason for this striking result, that the poor should pay taxes, and not the rich? Further discussion of the intuition follows next.

Understanding why wealth should not be taxed

Why is it that it is never optimal to tax capital accumulation, even if capital is concentrated in the hands of only a few? In the model economy the preferences are such that the price elasticity of consumption is the same for all periods, and, similarly, the wage elasticity of labor is also the same for all periods. The simple principle of optimal taxation, that goods that are equally elastic should be taxed at the same rate, should apply here. For this reason, consumption in every period would be taxed at the same rate and labor in every period would also be taxed at the same rate.[2] This means that capital accumulation would not be taxed, because what the taxation of capital does is tax consumption and labor at different rates over time.[3] This argument should apply independently of issues of distribution. All agents have the same preferences, with the same constant elasticities. All goods, in all periods, for all agents, should be taxed at the same rate.

There is another basic principle of optimal taxation, that should also apply here: Pure rents ought to be taxed, both to transfer resources at zero cost from the private agents to the government and to distribute resources across agents. The two principles, of uniform taxation and taxation of rents, could conflict.

Not so, in the model in this article. In the model here, there are instruments to tax pure rents that are independent from the instruments used to tax consumption and labor at uniform rates. The pure rents in this model are the rents from the initial wealth. And, in this model, it is possible to deal directly with the initial confiscation of wealth, independently of how future wealth is taxed. There is no need to deviate from uniform taxation in order to confiscate the initial wealth.

The results in this article, after Chari *et al.* (2016), differ from the results in the influential papers of Chamley (1986) and Judd (1985) and more recently Straub and Werning (2014) because the conflict between those two principles, of uniform taxation and taxation of pure rents, is present in that literature. The reason is that there are additional restrictions on the tax instruments. In particular they only consider a capital income tax that cannot exceed 100%.

2. This is a well known result in public finance attributed to Atkinson and Stiglitz (1972) which is also an application of the result in Diamond and Mirrlees (1971) on the optimality of productive efficiency.

3. A positive tax on capital accumulation taxes consumption tomorrow more than consumption today, and labor today more than labor tomorrow.

Here, instead, we consider a wealth tax, also restricted not to exceed 100%. In Chamley (1986) and Judd (1985), it is shown that it is optimal to fully tax capital income for a while in order to partially confiscate the initial installed capital. In Straub and Werning (2014), it is shown that the full taxation of capital income could actually last forever, also as a way to confiscate the initial wealth.

The optimal tax on the accumulation of wealth is zero starting today. This is the case independently of the concentration of wealth and the weights of the different agents in the welfare function. The fact that capital accumulation should not be taxed even if capital is all owned by one agent with zero weight, means that the workers without capital benefit from the owners of capital being exempt from taxes on capital accumulation. But it does not mean that capital should not be taxed at all. Today's installed capital will in principle be taxed, depending again on the distribution of wealth and on the welfare function. Taxing the installed capital today does not distort marginal decisions, so the only reason not to tax it is distributional. Now, does this make sense, that future capital should never be taxed, independently of the distribution of capital, while today's installed capital should be taxed fully, except for reasons of distribution?

If future capital should never be taxed, then in the future when future capital becomes today's installed capital, how can it then be taxed fully? How can the government be committed not to tax in the future, when it is free to tax in the present? Indeed, the only reason why it is optimal to tax today's installed capital is because the tax payers are surprised by a tax that was not taken into account in the past. If a government is committed not to defraud expectations on net returns, that will rule out the confiscation of the initial installed capital, whether that is done directly, or indirectly through the taxation of future capital.

As it turns out, the result that the taxes on capital accumulation are exactly zero hinges on the preferences, standard in macro models, that have constant elasticity for consumption and labor. In general, with elasticities that may be time varying with the allocation, it is going to be optimal to tax consumption in different periods at different rates, and labor in different periods also at different rates. In that case, it may be optimal to either tax or subsidize future capital, depending on whether future elasticities are larger than current elasticities. In the steady state, the allocation is constant and therefore, the elasticities are also constant. Therefore, in the steady state capital should not be taxed, as argued by Chamley (1986) and Judd (1985) among others.[4] Even if not fully general, the result that capital accumulation should never be taxed is a very useful benchmark. It suggests that there may be no major

4. See also Atkeson *et al.* (1999) and Chari *et al.* (1994).

economic justification for a recurrent tax on wealth, regardless of how wealth is distributed in the economy.

The remaining of this article contains the technical proofs of the results for the optimal taxes, first, in an economy with a representative agent and, second, in economies with capital-rich and poor agents.

The neoclassical growth model with taxes

The model is the deterministic neoclassical growth model with taxes. This is the standard model used in the literature on capital income taxation, in particular in Chari *et al.* (2016). The preferences of a representative household, over consumption c_t and labor n_t, are described by a standard utility function with constant elasticity in consumption and labor,

$$U = \sum_{t=0}^{\infty} \beta^t \left[\frac{c_t^{1-\sigma} - 1}{1-\sigma} - \eta n_t^{1+\psi} \right], \tag{1}$$

with $\sigma > 0$ and $\psi > 0$. σ is the elasticity of the marginal utility of consumption with respect to consumption, which is the inverse of a price elasticity of consumption and ψ is the elasticity of the marginal utility of labor with respect to labor, which is the inverse of a wage elasticity of labor.

The production technology is described by

$$c_t + g_t + k_{t+1} - (1-\delta) k_t \leq F(n_t, k_t), \tag{2}$$

where k_t is capital, g_t is exogenous government consumption, and δ is the depreciation rate. F is constant returns to scale.

The household owns the capital stock and rents it to a representative firm every period at rate u_t.[5] The household accumulates the capital stock k_{t+1}, as well as public debt b_{t+1}. There is a capital income tax τ_t^k, paid by the household on the rental rate of capital with an allowance for depreciation. There is also a wealth tax l_t, paid by the household, levied on the value of capital and outstanding debt. The household also pays a labor income tax τ_t^n. We abstract from other taxes, such as consumption and dividend taxes, because they do not change the problem in fundamental ways.

The flow of funds for the household can be described by

$$\begin{aligned} \frac{1}{1+r_{t+1}} b_{t+1} + k_{t+1} &= (1-l_t)\left[b_t + (1-\delta) k_t + u_t k_t - \tau_t^k (u_t - \delta) k_t\right] \\ &\quad + (1-\tau_t^n) w_t n_t - c_t, \end{aligned}$$

5. If instead capital was accumulated by firms, the results would not change.

for $t \geq 0$. The household maximizes utility (1), subject to the budget constraint obtained from this flow of funds together with a no-Ponzi games condition. The single budget constraint of the household can be written as

$$\sum_{t=0}^{\infty} q_t \left[c_t - (1-\tau_t^n) w_t n_t\right] \leq (1-l_0) \left[b_0 + k_0 + \left(1-\tau_0^k\right)(u_0 - \delta) k_0\right],$$

where $q_t = \frac{1}{(1+r_1)(1-l_1)\ldots(1+r_t)(1-l_t)}$ for $t \geq 1$, with $q_0 = 1$. At the optimum for the household, the constraint holds with equality.

The marginal conditions of the household problem are

$$-\frac{u_{c,t}}{u_{n,t}} = \frac{1}{(1-\tau_t^n) w_t}, \tag{3}$$

$$u_{c,t} = (1-l_{t+1})(1+r_{t+1}) \beta u_{c,t+1}, \tag{4}$$

and

$$1 + r_{t+1} = 1 + \left(1-\tau_{t+1}^k\right)(u_{t+1} - \delta), \tag{5}$$

for all t, where $u_{c,t}$ and $u_{n,t}$ are the marginal utilities of consumption and labor in period t.

The representative firm maximizes profits

$$\Pi_t = F(k_t, n_t) - w_t n_t - u_t k_t. \tag{6}$$

The price of the good must equal marginal cost,

$$1 = \frac{w_t}{F_{n,t}} = \frac{u_t}{F_{k,t}}, \tag{7}$$

where $F_{n,t}$ and $F_{k,t}$ are the marginal productivity of labor and capital, respectively.

Using both the conditions for the household and the firm, the marginal conditions can be written as

$$-\frac{u_{c,t}}{u_{n,t}} = \frac{1}{(1-\tau_t^n) F_{n,t}}, \tag{8}$$

$$\frac{u_{c,t}}{\beta u_{c,t+1}} = (1-l_{t+1}) \left[1 + \left(1-\tau_{t+1}^k\right)\left[F_{k,t+1} - \delta\right]\right]. \tag{9}$$

It follows that

$$\frac{u_{n,t}}{\beta u_{n,t+1}} = \frac{(1-l_{t+1})(1-\tau_t^n)}{1-\tau_{t+1}^n} \frac{F_{n,t}}{F_{n,t+1}} \left[1 + \left(1-\tau_{t+1}^k\right)\left[F_{k,t+1} - \delta\right]\right]. \tag{10}$$

These conditions show how the different taxes distort the marginal choices. Indeed, the first best allocation would have the marginal conditions above with all the taxes set to zero, written as follows,

$$-\frac{u_{c,t}}{u_{n,t}} = \frac{1}{F_{n,t}}, \tag{11}$$

$$\frac{u_{c,t}}{\beta u_{c,t+1}} = 1 + F_{k,t+1} - \delta, \tag{12}$$

$$\frac{u_{n,t}}{\beta u_{n,t+1}} = \frac{F_{n,t}}{F_{n,t+1}} \left[1 + F_{k,t+1} - \delta\right]. \tag{13}$$

The budget constraint of the household can be used, together with the resource constraints, to write the budget constraint of the government.

The marginal conditions of the household and firm can be used to write the budget constraint of the household, as the following condition, which is commonly called an implementability condition,[6]

$$\sum_{t=0}^{\infty} \beta^t \left[u_{c,t} c_t + u_{n,t} n_t\right] \geq u_c\left(0\right)\left(1 - l_0\right)\left[b_0 + k_0 + \left(1 - \tau_0^k\right)\left(F_{k,0} - \delta\right) k_0\right]. \tag{14}$$

We impose restrictions on the tax rates, that they cannot be higher than 100%, so that the tax revenue cannot exceed the base. These are constraints that are usually imposed in this literature, even if somewhat arbitrary.

The implementability condition (14) together with the resource constraints (2) are the only equilibrium restrictions on the sequences of consumption, labor and capital. It is possible that even the implementability condition would not restrict the allocations. If the initial confiscatory taxes could be used to build up enough assets for the government, such that the path of future public consumption could be fully financed, then the only restrictions on the allocations would be the resource constraints. In that case the first best could be achieved. We assume this is not the case. We assume that even if the initial wealth of the household is fully confiscated, the tax revenue is not enough to pay for government consumption. Given the high levels of government consumption and transfers in most developed countries, this assumption is reasonable.

To show that the set of implementable allocations is fully characterized by the implementability condition (14) together with the resource constraints (2), it is necessary to show that all the remaining equilibrium conditions are satisfied. This is indeed the case, since all the other equilibrium condition, other than (14) and (2), are satisfied by other variables as follows:

$$1 = \frac{w_t}{F_{n,t}} \tag{15}$$

6. Allowing for nonnegative public transfers to the household, the condition can be written with greater than or equal.

determines w_t;

$$\frac{w_t}{F_{n,t}} = \frac{u_t}{F_{k,t}} \tag{16}$$

determines u_t;

$$-\frac{u_{c,t}}{u_{n,t}} = \frac{1}{(1-\tau_t^n)\, w_t} \tag{17}$$

determines τ_t^n;

$$u_{c,t} = (1 - l_{t+1})\,(1 + r_{t+1})\,\beta u_{c,t+1} \tag{18}$$

and

$$1 + r_{t+1} = 1 + \left(1 - \tau_{t+1}^k\right)(u_{t+1} - \delta) \tag{19}$$

determine l_{t+1} and r_{t+1}, given τ_{t+1}^k, for all $t \geq 0$.

Notice that the restrictions that the taxes cannot be larger than 100% would not bind here. Notice also that the capital income tax rate was not used for the implementation. This means that it is a redundant tax that can be set equal to zero. Indeed the wealth tax, here, plays the same role of the capital income tax with a gain. While the capital income tax can only tax the net income on capital, $(u_{t+1} - \delta)$, the wealth tax can tax the gross return, $1 + \left(1 - \tau_{t+1}^k\right)(u_{t+1} - \delta)$.

Future wealth should not be taxed

The optimal Ramsey policy can be obtained by solving the problem of maximizing utility subject to the implementability condition (14) and the resource constraints (2). The first straightforward result is on the optimal initial confiscation. In this economy it is optimal to fully confiscate initial wealth. The household benefits, because the marginal choices are not affected by the initial confiscation, and the higher that revenue is, the lower must the future distortionary taxes be.

The Ramsey problem then becomes the maximization of utility subject to the implementability condition with $l_0 = 1$,

$$\sum_{t=0}^{\infty} \beta^t \left[u_{c,t} c_t + u_{n,t} n_t\right] \geq 0, \tag{20}$$

together with the resource constraints (2). The first order conditions of this problem are the following:

$$-\frac{u_{c,t}}{u_{n,t}} = \frac{1 + \varphi\,(1 + \psi)}{1 + \varphi\,(1 - \sigma)} \frac{1}{F_{nt}}, \, t \geq 0, \tag{21}$$

$$\frac{u_{c,t}}{\beta u_{c,t+1}} = 1 + F_{k,t+1} - \delta, \, t \geq 0, \tag{22}$$

where φ is the multiplier of the implementability condition. It follows that

$$\frac{u_{n,t}}{\beta u_{n,t+1}} = \frac{F_{n,t}\left[1 + F_{k,t+1} - \delta\right]}{F_{n,t+1}}, \text{ for all } t \geq 0. \tag{23}$$

Notice that if the multiplier of the implementability condition was zero, $\varphi = 0$, then the conditions above would be the conditions of the first best, $(11) - (13)$.

With a strictly positive multiplier, then the marginal Ramsey conditions, $(21) - (23)$, mean that the optimal intratemporal wedge is constant over time, while the optimal intertemporal wedges are zero. In this economy it is optimal not to distort intertemporally starting in period zero.

By comparing the Ramsey marginal conditions to the equilibrium ones, $(8) - (10)$, distorted by the marginal tax rates, it becomes apparent how taxes should be optimally chosen. The optimal labor tax needs to be constant over time, and, in general, positive, so that tax revenue may be raised to finance government spending. On the other hand, capital accumulation should not be distorted and therefore both taxes on capital income and wealth ought to be set to zero, $l_{t+1} = 0$ and $\tau^k_{t+1} = 0$, for all $t \geq 0$.

Future wealth should not be taxed independently of the distribution of wealth

In the economy studied above it was shown that the optimal way to tax wealth is to do it once and for all, ex-post, without distorting future accumulation of wealth. Now, the economy we studied was one with a single representative agent, which is a useful construct to analyze macroeconomic aggregate behavior, but it is not necessarily the best model to answer the question of whether labor or capital should be taxed. In order to do this, it is important to allow for households that are capital-rich or poor and inquire whether in that case, it may turn out that capital accumulation should be distorted. As it turns out, it is still the case that even with capital unevenly distributed in the economy, it is not optimal to tax capital accumulation.

To see this, we now consider an economy with two agents, 1 and 2. The social welfare function is

$$\theta U^1 + (1-\theta)\, U^2,$$

with weight $\theta \in [0, 1]$. The individual preferences are assumed to be the standard constant elasticity preferences, and are the same for the two agent types,

$$U = \sum_{t=0}^{\infty} \beta^t \left[\frac{\left(c^i_t\right)^{1-\sigma} - 1}{1-\sigma} - \eta \left(n^i_t\right)^{1+\psi}\right]. \tag{24}$$

The resource constraints are

$$c_t^1 + c_t^2 + g_t + k_{t+1}^1 + k_{t+1}^2 - (1-\delta)\left(k_t^1 + k_t^2\right) \le F\left(n_t^1 + n_t^2, k_t^1 + k_t^2\right).$$

Tax rates are assumed not to discriminate across agents.

With heterogeneous agents it is no longer the case, that the initial wealth should always be fully taxed. That will depend on the distribution of wealth and on the weights.

The implementability conditions can be written as

$$\sum_{t=0}^{\infty} \beta^t \left[u_{c,t}^1 c_t^1 + u_{n,t}^1 n_t^1\right] = u_{c,0}^1 (1 - l_0) V_0^1 \tag{25}$$

and

$$\sum_{t=0}^{\infty} \beta^t \left[u_{c,t}^2 c_t^2 + u_{n,t}^2 n_t^2\right] = u_{c,0}^2 (1 - l_0) V_0^2, \tag{26}$$

with $V_0^i = \left[b_0^i + k_0^i + \left(1 - \tau_0^k\right)(F_{k,0} - \delta) k_0^i\right]$. Since the taxes must be the same for the two agents an implementable allocation must also satisfy the following marginal conditions

$$\frac{u_{c,t}^1}{u_{c,t}^2} = \frac{u_{n,t}^1}{u_{n,t}^2}$$

and

$$\frac{u_{c,t}^1}{u_{c,t}^2} = \frac{u_{c,t+1}^1}{u_{c,t+1}^2}$$

that equate the marginal rates of substitution across agents. These conditions can be written as

$$u_{c,t}^1 = \gamma u_{c,t}^2 \tag{27}$$

$$u_{n,t}^1 = \gamma u_{n,t}^2, \tag{28}$$

where γ is a choice variable for the planner.

Let φ^1 and φ^2 be the multipliers of the two implementability conditions, (25) and (26). The first order conditions for $t \ge 1$ imply

$$u_{c,t}^2 \frac{\gamma\left[\theta + \varphi^1(1-\sigma)\right]\frac{\sigma}{c_t^2} + \left[(1-\theta) + \varphi^2(1-\sigma)\right]\frac{\sigma}{c_t^1}}{\frac{\sigma}{c_t^2} + \frac{\sigma}{c_t^1}} = \lambda_t,\ t \ge 1, \tag{29}$$

together with

$$-\lambda_t + \beta\lambda_{t+1}\left[F_{k,t+1} + 1 - \delta\right] = 0.$$

Since, from (27), c_t^1 must be proportionate to c_t^2, $c_t^1 = \gamma^{-\frac{1}{\sigma}} c_t^2$, then it follows that (29) can be written as

$$u_{c,t}^2 \frac{\gamma\left[\theta + \varphi^1(1-\sigma)\right]\sigma\gamma^{-\frac{1}{\sigma}} + \left[(1-\theta) + \varphi^2(1-\sigma)\right]\sigma}{\sigma\gamma^{-\frac{1}{\sigma}} + \sigma} = \lambda_t, \tag{30}$$

and therefore

$$\frac{u^i_{c,t}}{\beta u^i_{c,t+1}} = F_{k,t+1} + 1 - \delta, t \geq 1. \tag{31}$$

Similarly, for labor, the first order conditions for $t \geq 1$ can be written as

$$u^2_{n,t} \frac{\gamma \left[\theta + \varphi^1 (1 + \psi)\right] \psi (\gamma)^{\frac{1}{\psi}} + \left[(1 - \theta) + \varphi^2 (1 + \psi)\right] \psi}{\psi (\gamma)^{\frac{1}{\psi}} + \psi} = -\lambda_t F_{n,t}, t \geq 1, \tag{32}$$

so that,

$$\frac{u^i_{n,t}}{\beta u^i_{n,t+1}} = \frac{F_{n,t}}{F_{n,t+1}} \left[F_{k,t+1} + 1 - \delta\right], t \geq 1, \tag{33}$$

and therefore the intertemporal wedge for labor is also zero. The intratemporal wedge is constant.

From the derivations above it follows that intertemporal margins should not be distorted from period one on. This means that it is not optimal to tax the accumulation of capital after period one. But period one is not the initial period. What about capital accumulation from period zero to period one? Should it be taxed?[7]

The first order conditions for period zero will have additional terms associated with the value of the initial wealth for the different households. It could in principle be desirable to distort capital accumulation in that initial period, between periods zero and one, in order to change the value of the initial wealth, and distribute from the households to the government and across households. As it turns out, that intertemporal distortion is not part of the optimal policy. In this economy with heterogeneous agents there are no restrictions on the initial tax rates, other than the upper bound of 100%. It is always preferable to use those initial tax rates, l_0 and τ^k_0, to optimally confiscate the initial wealth of the two agents, rather than using the distortion on the accumulation of capital in the initial period.

The effects of distorting capital accumulation in the initial period, on the value of the initial wealth, are through the prices, and the prices affect the two agents in the same proportion, as do the two tax rates. To see this, notice that the first order condition for consumption of type one in period zero has an additional term associated with the valuation of the initial wealth,

$$\theta u^1_{c,0} + \varphi^1 u^1_{c,0} (1 - \sigma) + \mu^c_0 u^1_{cc,0} - u^1_{cc,0} (1 - l_0) \left(\varphi^1 V^1_0 + \varphi^2 \frac{V^2_0}{\gamma}\right) = \lambda_0. \tag{34}$$

The derivative of the lagrangian with respect to l_0 can be written as $u^1_{c,0} \left[\varphi^1 V^1_0 + \varphi^2 \frac{V^2_0}{\gamma}\right]$. At the optimum, either this derivative is zero, if the

7. This could appear to be a technical detail. But it is not. This issue is at the origin of the presumption that capital ought to be taxed at high rates for a while (as in Chamley (1986) and Judd (1985)) or even forever (as in Straub and Werning (2014)).

solution is interior, or else $l_0 = 1$, if the solution is at the upper bound of a 100% tax rate. Either way, the last term in the first order condition, (34), is zero. It follows that the first order condition for period zero, (34), has the same form as the ones for $t \geq 1$.[8] There are also additional terms for labor in the first order conditions at time zero. These are also zero at the optimum.

This means that regardless of how the initial confiscation takes place, whether it is full confiscation or not, it is never optimal to distort the accumulation of future capital. This is the case independently of the weights of the two agents.

8. See Werning (2007) for a related argument.

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