Capital Taxation and Electoral Accountability

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Abstract

This paper investigates the role of performance voting in solving the capital levy problem. In a representative democracy, voters can use elections to protect their property by holding politicians accountable for the tax policies they implement. We characterize the set of tax policies that can be sustained by symmetric performance standards and show when this set contains the second best (Ramsey) tax policy.

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1 Introduction

In societies where rulers are free to expropriate the property of their citizens, the incentive to invest is significantly reduced and accumulation is forestalled.

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The reason − known as the capital levy problem[1] − is that once investments have been undertaken by citizens, they become "sitting ducks" for the ruling politician, who may want to tax the capital stock at an excessively high rate in order to increase his own consumption, to expand the public sector, or to reduce labor taxes. Citizens anticipate this, and react, not only by reducing private investments, but also, as pointed out by, for example, Hettich and Winer (1999, pp. 116-117), by inventing or by using existing political institutions to protect themselves against expropriation.

The purpose of this paper is to demonstrate that performance voting in a representative democracy can under some circumstances solve the capital levy problem. In a representative democracy, voters elect (and reelect) politicians, who implement policies on their behalf, using the majority rule. Politicians are frequently unable to commit themselves to a particular policy plan at the time of election. Voters and, more generally, decision makers in the private sector, therefore, expect politicians, without further incentives, to tax capital heavily. Voters can provide incentives by holding the politician accountable at election times for past behavior. In particular, they can elect politicians on the understanding that they will not be reelected unless they perform up to a certain, pre-specified standard, as first suggested by Barro (1973) and Ferejohn (1986). We characterize the set of tax rates that can be sustained by (symmetric) political equilibria in which voters non-cooperatively set standards that the politician is required to satisfy to get the vote of each of them. This set contains the second best (Ramsey) tax if the politician values political office sufficiently. We stress that voters need to coordinate their voting behavior to use elections effective to solve the capital levy problem and that absence of coordination may result in full expropriation of capital and high electoral turnover.

The rest of this paper is organized as follows. In Section 2, we provide a brief literature review and relate our work to the existing literature. In Section 3, we develop a simple model of capital taxation. The model has the minimum

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[1] See, e.g., Fischer (1980) and Benhabib and Rustichini (1997).

properties needed to formalize our argument and is chosen for transparency. In Section 4, we present two benchmarks against which the performance voting solution can be compared. One is the second best (Ramsey) tax solution achieved with commitment. The other is the solution to the capital levy problem suggested by Chari and Kehoe (1990). They show that citizens can use history dependent investments and consumption plans to sustain tax rates below full expropriation. In Section 5, we allow voters to use elections to protect themselves against expropriation and we characterize the set of tax rates that can be sustained in this way and compare to the two benchmarks. In Section 6, we discuss the robustness of our analysis, and in Section 7, we discuss some empirical implications.

2   The Literature

Following Kydland and Prescott (1977), a substantial literature has investigated how societies can and do deal with problems of time inconsistency.[2] Democratic institutions play an important role in this. Persson and Tabellini (1994), for example, argue that *strategic delegation* in a representative democracy can provide a solution to the capital levy problem in a two-period median voter model. They show that the median voter wants to delegate decision making power to a "conservative" politician. In the period between elections, the median voter cannot change her mind. Accordingly, once a representative is elected, the median voter is "committed" to accept whatever policy the representative implements. By electing a representative with a stronger dislike for capital taxation than herself, the median voter can (under certain circumstances) make sure that the capital tax implemented by her representative *after* investments are sunk corresponds to the capital tax that she herself would have liked to commit to *before* investments are sunk. Our model is also one of a representative democracy: the production of a public good is delegated to a (benevolent) politician with the powers to raise the necessary finance by means of capital taxation. Delegation,

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[2] See Drazen (2000, chapter 4 and 5) or Persson and Tabellini (2000, chapter 12) for surveys.

however, carries a cost in the sense that the politician has an incentive to expropriate capital as soon as it becomes sunk and is, thus, not, as in Persson and Tabellini (1994), in itself a solution to the capital levy problem. Instead, voters must provide incentives for the politician not to expropriate. To this end, they use elections as an implicit incentive contract and hold politicians accountable for their policy choices after the fact.[3]

An alternative channel through which citizens can prevent expropriation is lobbying, as pointed out recently by Garfinkel and Lee (2000) and Marceau and Smart (2003). Garfinkel and Lee (2000) assume that all individuals invest in capital but differ in their desire for public spending. Individuals who care little about public spending have an incentive to form lobby groups in order to protect themselves against high capital taxes, while those who care a lot may decide – before investments are sunk – not to lobby. The lobby groups that do emerge then "bribe" the government to tax capital more lightly by providing, say, campaign finance. This mechanism can partly solve the capital levy problem. Marceau and Smart (2003) reach the same conclusion but via a different mechanism. They assume that all individuals engage in lobbying but show that those with a high stake in low capital taxes have an inherited advantage in lobbying and that is what keeps taxes low at equilibrium (under some circumstances). Both papers use the common agency model – developed by Bernheim and Whinston (1986) – to show their point. This implies that they assume that the lobby groups can commit to particular contribution functions and promise to pay specific sums of money depending on the policy being implemented. These contribution schedules are not time consistent: once the politician has implemented a policy, the lobby groups have a strict incentive not

[3] As shown by Persson and Tabellini (2000, chapters 4 and 9), a similar logic applies in a range of other public finance problems. In particular, voters can reduce wasteful public spending, i.e., spending that benefits politicians at the expense of the electorate, by making the right to collect such rents in the future (reelection) contingent on a reduction in current wasteful spending. In contrast, Coate and Morris (1999) provide an example in which the electoral accountability mechanism may not be sufficiently strong to prevent inefficient policy programs to persist once they have been implemented (with the consent of the electorate).

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to pay the promised reward. In reality, however, one expects that governments would punish lobby groups that do not keep their promises and that this would go some way towards providing proper incentives for the lobbies to keep their promises. We do not consider lobby groups in our analysis and focus instead on performance voting. As long as voters can readily find a (perfect) substitute for the incumbent politician, they have no strict incentive to deviate from the announced voting rule after the politician has implemented the tax policy for the current period. Therefore, we only require that voters have a minimum of commitment power: if indifferent, they do what they promised to do. It is clear, however, that the assumption of perfect substitutes is critical: when such substitutes are not available, voters do need some means of committing to particular voting strategies or otherwise making them credible in order to control politicians effectively.[4] A complete model of the politics of capital taxation would take both lobbying and voting into account, and we do not view the two as mutual exclusive solutions to the capital levy problem.

Our paper is also closely related to the literature on capital taxation in economies with an infinite time horizon, and we provide a detailed comparison with results from this literature in Sections 4 and 5.2. Briefly, as demonstrated by Chari and Kehoe (1990), citizens can, in such economies, use *history dependent* allocation plans to sustain non-expropriating capital tax policies, including, if the discount factor is sufficiently large, the Ramsey rule. The idea is that the (benevolent) politician wants to preserve his *reputation* for not expropriating capital. Investors exploit this by letting the politician understand that they will stop investing if they ever observe expropriation. In this literature, the underlying political process is not considered in detail. We, in contrast, provides some institutional details and show how citizens can use their democratic right to terminate the tenure of a misbehaving politician to avoid expropriation without having to resort to complicated history dependent allocation plans and voting strategies. Again, we stress that this should be understood as a complement

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[4] See McCallum (1995) and Jensen (1997) for a critique of solutions to time inconsistency problems that *relocate* the commitment problem rather than solve it.

to the reputation mechanism and that voters, in principle, could combine performance voting with complex history dependent allocation plans and voting strategies.

3 The Economic Model

We consider an economy that is populated by $n + 1$ identical, infinitely-lived citizens, indexed by i. Each period, one citizen is selected to run the government (as detailed below). The remaining n citizens are households. We denote the set of households by $\mathcal{V}$. Households undertake economic activities in the two productive sectors of the economy. The C-sector is perfectly competitive and produces a consumption good. The consumption good can be used for private (c_t) or public (g_t) consumption and is produced by a linear technology using human capital (h_t) as the only input. The marginal product of (human) capital is constant and equal to $R > 0$. The I-sector is a household sector that produces human capital from *effort* (e_t). The marginal product of effort is constant and equal to 1. Human capital cannot be stored between periods, so

$$h_t = \sum_{i \in \mathcal{V}} e_{it}, \tag{1}$$

where e_{it} is the effort choice of household i. In each period, $t = 0, 1, 2, ...,$ households make decisions at two distinct points in time. At the first stage of period t, each household decides how much effort to invest in accumulation of human capital. The human capital is rented to firms and used in the production of output. At the second stage, households consume private and public goods. Each household $i \in \mathcal{V}$ receives income net of taxes, $R(1 - \tau_t)e_{it}$, where $\tau_t \in [0, 1]$ is a proportional capital tax levied by the government for that period. There are no non-distortionary means of raising revenue. The budget constraint of household $i \in \mathcal{V}$ reads:

$$c_{it} \leq R \left(1 - \tau_t\right) e_{it}. \tag{2}$$

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The tax revenue, $\tau_t R h_t$, is used, by the government, to produce public goods (g_t):

$$g_t = \tau_t R h_t. \tag{3}$$

The public good is consumed by all households as available. Each household derives utility from private and public goods, and disutility from effort. The per-period utility function is

$$u(c_{ti}, e_{it}; g_t) = c_{it} - \frac{e_{it}^{1+\chi}}{(1+\chi)} + \gamma g_t, \tag{4}$$

where $\chi > 1$ is the elasticity of the marginal disutility to effort and γ indicates the importance of public consumption relative to private consumption. We assume that $\gamma > 1$. This implies that households prefer the public to the private good and provides the rationale for appointing a politician to produce g_t.[5] The discount factor is $\beta \in (0, 1)$. Households take τ_t and g_t as given when making effort decisions in the first stage and consumption decisions in the second stage.

4   Two Benchmarks

The allocation of resources in this economy depends critically on the assumptions we make about the behavior of the government. The main purpose of the paper is to study allocations in a representative democracy with performance voting. We do so in the next section. This section is devoted to two important benchmarks. Since both benchmarks are well-known, we shall be brief in the exposition and relegate the details to the Appendix. In both cases, we assume that the government's objective is to choose a tax policy for each period to maximize the utility of a representative household.

In the first benchmark, we assume that the government can commit to a sequence of tax rates and that households choose a sequence of effort levels at time 0 for all times. This allows the second best (Ramsey) outcome to

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[5] If $\gamma \leq 1$, the politician has no incentive to tax capital to provide public goods, and the capital levy problem does not arise.

be achieved. A Ramsey equilibrium requires that i) for every sequence of tax policies, the effort and consumption decisions of each household $i \in \mathcal{V}$ maximize $\sum_{t=0}^{\infty} \beta^t u(c_{it}, e_{it}; g_t)$ subject to equation (2) and $(c_{it}, e_{it}) \geq 0$ for all t; and ii) the sequence of tax rates maximize $\sum_{t=0}^{\infty} \beta^t u(c_{i't}(\tau_t), e_{i't}(\tau_t); g_t)$ subject to $g_t \leq \tau_t R h(\tau_t)$, where i' refers to a representative household. We find:

Proposition 1 *The sequence of second best (Ramsey) tax rates is*

$$\tau^{sb} = \frac{(\gamma n - 1)\chi}{(\gamma n - 1)\chi + \gamma n} \in (0,1) \ for \ t = 1, 2, ... \tag{5}$$

The second best tax rate is positive, less than one and stationary. The government trades off the negative effect of capital taxation on effort with the welfare gain associated with higher public consumption. The second best tax rate is increasing in the valuation of public consumption (γ) and as γ goes to infinite, τ^{sb} goes to $\chi / (1 + \chi)$ − the value of τ that maximizes per-period tax revenue. The Ramsey outcome defines the best possible allocation of resources − given that taxation is distortionary − and is the benchmark to which other outcomes should be compared.

In the second benchmark, the government cannot commit to a sequence of tax rates. We capture the lack of commitment by assuming that in each period the government sets the current tax rate τ_t between stage 1 and 2; that is, after households have made their effort decisions, but before they consume. This timing provides the government with a short-term incentive to tax human capital excessively simply because the effort is sunk at the point in time when the tax is levied. The fact that the economy has an infinite time horizon, however, allows the households to partly or wholly eliminate the commitment problem by making their decisions contingent on the history of government policies. Chari and Kehoe (1990) characterize the set of policy plans that can be sustained in this way. Loosely speaking, the idea is that the households punish the government if it ever deviates from the specified sequence of tax rates by threatening not to make any effort to accumulate human capital ever again. This generates zero utility to all and is the worst possible outcome.

We can interpret this as saying that the government loses its reputation if it breaks the implicit agreement with the private sector. Chari and Kehoe (1990) refer to sequences of tax rates that can be sustained through this reputation mechanism as sustainable equilibria. We can apply their main result directly to our economy and state the following result (see the Appendix for details).

Proposition 2 *(Chari and Kehoe, 1990, Proposition 2) A stationary sequence of tax rates τ^{su} can be implemented as the outcome of a sustainable equilibrium if and only if $\tau^{su} \in [\underline{\tau}^{su}, 1]$ where*

$$\underline{\tau}^{su} = \max\{\frac{(1+\chi)(\gamma n - 1) + (1 - \gamma n(1+\chi))\beta}{(1+\chi)(\gamma n - 1) + \beta}, 0\}. \tag{6}$$

The second best (Ramsey) tax rate is sustainable for $\beta > \overline{\beta}^{su}$ where

$$\overline{\beta}^{su} = \frac{(\chi + 1)(\gamma n - 1)}{(\gamma n - 1)(1 + \chi + \chi^2) + \chi n \gamma} < 1. \tag{7}$$

The proposition characterizes the largest set of tax rates, $[\underline{\tau}^{su}, 1]$, that can be sustained by the reputation mechanism. For $\beta > 0$, it is possible to sustain better outcomes than full expropriation ($\tau = 1$), and as the discount factor becomes larger, the set of sustainable tax rates increases. For a sufficiently high discount factor ($\beta > \overline{\beta}^{su}$), the set includes the second best (Ramsey) tax.

5   The Political Model

In this section, we analyze capital taxation in a representative democracy and show how electoral accountability may allow households partly or wholly to overcome the capital levy problem.[6] The analysis is based on the theory of performance voting originally developed by Barro (1973) and Ferejohn (1986).[7]

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[6] See Dutta et al. (1998) for an analysis of the political economy of recent changes in capital taxation in the UK.

[7] The idea that voters hold politicians accountable for actions taken while in office has received considerable empirical support (see Nannestad and Paldam, 1994).

5.1 Performance Voting

Each period, the authority to levy taxes is delegated to a politician. The objective of the politician is to choose a tax policy that maximizes the utility of a representative household. The politician applies the same discount factor as households. The politician cannot commit to specific tax plans, but reacts to the incentives provided to him by households. Politicians enjoy being politicians and they earn the ego rent $m > 0$ from holding office. At the end of each period, an election is held in which the incumbent politician runs against a challenger selected from one of the households. All households are eligible to vote in the elections.[8] The majority rule determines whether the incumbent is reelected for another term or not. If the incumbent politician loses office, he returns to the private sector, and the challenger takes office and becomes the politician. The ego rent provides the incumbent politician with an incentive to hold on to office, and this is what allows the electorate to influence his policy choice. To this end, each voter (household) $i \in \mathcal{V}$ sets a performance standards immediately after each election, and let the newly elected (or reelected) politician understand that he is only getting the vote of that particular voter in the next election if he implements a policy that is found satisfactory compared to the standard.

To make the contrast between this and the reputation mechanism discussed above as clear as possible, we do not allow voters to make their reelection plans dependent on the entire history of tax rates, but only on the tax policy implemented in the current period. Likewise, the effort and consumption plans of households are only allowed to depend on within period events. We need to make a distinction between the history of the first and second stage of each period. To this end, we denote the first stage history of period t by H_{1t}^R. Since the policy implementation of period t is not known until after the first stage, H_{1t}^R does not include information about the actual policy choice. In contrast, the second stage history of period t, denoted H_{2t}^R, includes such information.

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[8] Although we could allow the politican to cast a vote (for himself) without affecting any of our results, we shall, for simplicity, ignore this in what follows.

We can now define the game between the elected politicians and voters more precisely. At the beginning of the first stage of period t, a politician takes office and each voter $i \in \mathcal{V}$ announces a vote function, $\eta_{it}(\tau_{it}^I)$, that indicates, for each policy implementation, $\tau_t^I \in [0, 1]$, whether $(\eta_{it}(.) = 1)$ or not $(\eta_{it}(.) = 0)$ the politician gets the vote of voter i in the election held at the end of the period.[9] We restrict attention to threshold vote functions of the following type

$$\eta_{it}(\tau_t^I) = 1 \text{ iff } \tau_t^I \leq \tau_{it}^s, \tag{8}$$

$$\eta_{it}(\tau_t^I) = 0 \text{ iff } \tau_t^I > \tau_{it}^s, \tag{9}$$

where τ_{it}^s is the performance standard announced by voter $i \in \mathcal{V}$ at time t. After the effort decision has been made by households, the politician implements a tax policy for the current period $(\tau_t^I \in [0, 1])$. An implementation strategy of the politician is then a mapping from the set of thresholds onto $[0, 1]$ with the property that at least half of the standards needs to be satisfied to get reelected. In the second stage of period t, households make their consumption choices and cast their votes according to the vote functions $\eta_{it}(\tau_t^I)$ and the politician is reelected or not. If the politician is not reelected, he returns to the private sector and a new politician enters office. After that, the sequence of events repeats itself.[10]

We say that a sequence of vote functions, effort and consumption plans, and policy implementation rules is a *political equilibrium* if the following conditions are satisfied: i) given the sequence of policy implementation rules, each household $i \in \mathcal{V}$ chooses an effort and consumption plan for each period to maximize $\sum_{t=0}^{\infty} \beta^t u(c_{it}(H_{2t}^R), e_{it}(H_{1t}^R); g_t)$ subject to $c_{it}(H_{2t}^R) \leq R(1 - \tau_t^I) e_{it}(H_{1t}^R)$ and $(c_{it}, e_{it}) \geq 0$; ii) given the vote functions and the effort and consumption plans

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[9]We specify the performance standard directly on the policy instrument. Identical results obtain in the present model if we specified the standard in terms of utility levels.

[10]The timing of events implies that there is only one policy decision per election period. The proper interpretation of the policy decision is that it is a summary of everything the politician does while in office. In reality, the frequency of policy making is higher than that of elections. It is possible to accommodate this within the current model by allowing voters to set multiple standards at the beginning of each election term.

for period t, the politician chooses the tax policy τ_t that maximizes his life-time utility subject to the public sector budget constraint; iii) the vote function announced by voter $i \in \mathcal{V}$ must maximize her life-time utility taking as given the vote functions of the other voters and the policy implementation rule of the politician. We refer to a political equilibrium where all voters use the same vote function as a *symmetric political equilibrium*. The outcome of a political equilibrium is a sequence of policy implementations, effort and consumption choices, and election results. We restrict attention to stationary equilibria.

5.2 Political Equilibrium

In Proposition 3, we characterize the set of tax rates that can be supported by a stationary symmetric political equilibrium and show when the second best (Ramsey) tax rate belongs to this set.

Proposition 3 *(Symmetric Political Equilibria) The stationary sequence of tax rates τ^{po} can be supported as the outcome of a symmetric political equilibrium if and only if $\tau^{po} \in [\underline{\tau}^{po}, 1]$ where*

$$\underline{\tau}^{po} = \max \left[1 - \left(\frac{\beta m}{(1-\beta)(\gamma n - 1)R^{\frac{1+\chi}{\chi}}} \right)^{\frac{\chi}{1+\chi}}, 0 \right]. \tag{10}$$

The second best (Ramsey) tax can be supported as the outcome of a symmetric political equilibrium if $\beta > \overline{\beta}^{po}$ where

$$\overline{\beta}^{po} = \frac{(\gamma n - 1)(\gamma n R)^{\frac{1+\chi}{\chi}}}{m\left((\gamma n - 1)\chi + \gamma n\right)^{\frac{1+\chi}{\chi}} + (\gamma n - 1)(\gamma n R)^{\frac{1+\chi}{\chi}}} < 1. \tag{11}$$

Proof. Suppose that all voters $i \in \mathcal{V}$ announce identical vote functions:

$$\eta(\tau_t^I) = 1 \text{ iff } \tau_t^I \leq \tau^s, \tag{12}$$

$$\eta(\tau_t^I) = 0 \text{ iff } \tau_t^I > \tau^s, \tag{13}$$

where τ^s is a stationary performance standard and τ_t^I is the policy implementation chosen by the politician. Suppose further that the politician uses the

(stationary) policy rule $\tau(\tau^s)$. Given that, the households' effort and consumption plans for period $t = 0, 1, ...$ are identical and equal to

$$e(\tau(\tau^s)) = [R(1 - \tau(\tau^s))]^{\frac{1}{\chi}};\qquad(14)$$

$$c(\tau(\tau^s), \tau_t^I) = (1 - \tau_t^I)R[R(1 - \tau(\tau^s))]^{\frac{1}{\chi}}.\qquad(15)$$

Let

$$u(\tau^s, \tau_t^I) = c(\tau(\tau^s), \tau_t^I) + \gamma g(\tau(\tau^s), \tau_t^I) - \frac{e(\tau(\tau^s))^{1+\chi}}{1 + \chi}.\qquad(16)$$

Consider the politician in office in period t. His payoff can be written as

$$V_t = m + u(\tau^s, \tau_t^I) + \beta\eta(\tau_t^I)V_{t+1}^C + \beta(1 - \eta(\tau_t^I))V_{t+1}^P\qquad(17)$$

where V_{t+1}^C is the continuation value if the politician is reelected at the end of period t and V_{t+1}^P is the value if he is not reelected and returns to the private sector.[11] The politician in office at time t maximizes V_t subject to the public budget constraint. Suppose the politician does not want to be reelected. For $\beta > 0$, it is never profitable to postpone deviation, so deviation takes place at time t. The best deviation is to implement $\tau_t^I = 1$ with payoff

$$V_t^D = u(\tau^s, 1) + m + \beta V_{t+1}^P.\qquad(18)$$

Suppose the politician wants to be reelected. Then, the best policy implementation is $\tau_t^I = \tau^s$, with payoff

$$V_t^C = u(\tau^s, \tau^s) + m + \beta V_{t+1}^C.\qquad(19)$$

[11] The standard assumption is that politicians who lose office never serve again and that challengers are drawn from an infinite poll of potential politicians. However, since we assume that the population of the economy is finite, we cannot make this assumption. Instead, we assume that an individual is drawn at random from the pool of households to challenge the incumbent politician at each election, and that the politician (in office) does not internalize the probability of being reelected at some later point in time after having lost office in the current period. Likewise, individual voters do not take into account that they may be selected to challenge the incumbent when they set their performance standards. With a large population of citizens this seems reasonable.

Note that $V_t^C \geq V_t^D \Rightarrow V_{t+s}^C \geq V_{t+s}^D$ for all $s \geq 1$. Thus, $V_t^C \geq V_t^D$ if and only if

$$\phi(\tau^s) \equiv u(\tau^s, 1) - u(\tau^s, \tau^s) \leq \frac{\beta m}{1 - \beta}. \qquad (20)$$

With the additional assumption that the politician complies if indifferent, condition (20) is necessary and sufficient for compliance and we conclude that $\phi(\tau^s) \leq \frac{\beta m}{1-\beta} \Rightarrow \tau(\tau^s) = \tau^s$ and that $\phi(\tau^s) > \frac{\beta m}{1-\beta} \Rightarrow \tau(\tau^s) = 1$. Use equations (14) and (15) to see that $\phi(\tau^s) = (\gamma n - 1) [R(1 - \tau^s)]^{1+\frac{1}{\chi}}$ with i) $\phi(0) > 0$; ii) $\phi(1) = 0$; and iii) $\frac{\partial \phi(.)}{\partial \tau^s} < 0$ for all $\tau^s \in [0, 1]$. Thus, there exists a value of $\tau^s \in [0, 1]$, call it $\underline{\tau}^{po}$, such that $\phi(\underline{\tau}^s) \leq \frac{\beta m}{1-\beta}$ for all $\tau^s \geq \underline{\tau}^{po}$. Rearranging yields the expression in equation (10). The critical value of the discount factor $\overline{\beta}^{po}$ is found by rearranging $\tau^{sb} \geq \underline{\tau}^{po}$.

Consider the voters. The politician needs to satisfy at least half of the standards to get reelected. However, since all voters benefit from the public good and pay the same tax, it is impossible for the politician to give preferential treatment to any subset of voters. In a symmetric Nash equilibrium $\tau_i^s = \tau^s$ for all $i \in \mathcal{V}$. Suppose that all voters announce τ^s. Any particular voter i cannot change the policy outcome by deviating to some $\tau_i \neq \tau^s$ and, thus, has no (strict) incentive to deviate from τ^s. If $\tau^s < \underline{\tau}^{po}$, then $\tau(\tau^s) = 1$ and $e(1) = 0$. If, on the other hand, $\tau^s \geq \underline{\tau}^{po}$, then $\tau(\tau^s) = \tau^s$ and $e(\tau^s) = [R(1 - \tau^s)]^{\frac{1}{\chi}}$. We conclude that all $\tau \in [\underline{\tau}^{po}, 1]$ can be supported as outcomes of a symmetric political equilibrium. Finally, note that no $\tau \notin [\underline{\tau}^{po}, 1]$ can be the outcome of a symmetric political equilibrium because all politicians would prefer to expropriate (set $\tau_t^I = 1$) and not get reelected to any $\tau \in [0, \underline{\tau}^{po})$ ∎

The proposition demonstrates that performance voting can, in principle, prevent complete expropriation of capital whenever politicians value the future $(\beta > 0)$ and derive utility from being in power $(m > 0)$. In fact, all tax rates in the interval $[\underline{\tau}^{po}, 1]$ can be supported as outcomes of symmetric political equilibria. Under certain circumstances, which we shall discuss in more detail below, the second best (Ramsey) tax can be sustained. The tax rates in $[\underline{\tau}^{po}, 1]$ can be sustained for an intuitive reason. Each period, the politician faces the temp-

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tation to expropriate the existing capital stock (i.e., to set $\tau_t^I = 1$), thereby exploiting the fact that effort is sunk. The *temptation to expropriate* capital is $\phi(\tau^s) = (\gamma n - 1) \left[R(1 - \tau^s) \right]^{1 + \frac{1}{\chi}}$. The incumbent politician balances the temptation to expropriate against the desire to be reelected and earn the *reelection reward* $\frac{\beta m}{1 - \beta}$. When voters coordinate on a (symmetric) performance standard such that $\frac{\beta m}{1 - \beta} \geq \phi(\tau^s)$, the politician prefers to comply and implements $\tau_t^I = \tau^s$ to secure reelection at each t. The lowest tax rate that can be supported in this way is $\underline{\tau}^{po}$. We notice, however, that there exist equilibria in which voters set a standard such that $\frac{\beta m}{1 - \beta} < \phi(\tau^s)$. These equilibria are associated with extreme outcomes: each politician expropriates all capital and foregoes reelection; households foresee this and stop investing effort in accumulation of human capital. The set of tax rates that can be sustained as an outcome of a symmetric political equilibrium depends critically on the ego rent – and more generally on the idea that politicians value political office – and the discount factor. We stress that these are substitutes in the sense that an increase in either β or m never decreases the set of sustainable tax rates. The intuition is that a high discount factor or a high ego rent increases the reelection reward while leaving the temptation to expropriate unchanged.[12]

It is instructive to compare these results with the benchmarks discussed in the previous section. The reputation mechanism allows citizens to avoid expropriation by threatening to stop investing in all future periods if the tax policy ever falls short of expectations.[13] This type of punishment is, of course, costly

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[12] The range of sustainable tax rates also depends on the other fundamentals, γ and R, of the model. A high return to investment, R, makes it harder to control politicians and so $\underline{\tau}^{po}$ is non-decreasing in R. This is simply because the capital stock available for expropriation is larger and so the temptation to expropriate is greater. An increase in the valuation of public consumption, γ, increases the temptation to expropriate capital and so $\underline{\tau}^{po}$ is non-decreasing in γ.

[13] The set of sustainable tax rates characterized in Proposition 2 is the largest set that can be sustained by the reputation mechanism because the punishment equilibrium is the worse possible equilibrium. It is clear, however, that smaller subsets can be sustained by less extreme punishment strategies.

not only to the politician, but also to the households themselves. The electoral accountability mechanism, on the other hand, explores the fact that politicians value political office and that voters can replace politicians that misbehave at regular intervals. An implication is that citizens can punish their politicians without having to stop investing: the ego rent provides them with an alternative and cost-effective way of punishing misbehavior. Against this background, it is not surprising to note, by comparing $\underline{\tau}^{su}$ from Proposition 2 with $\underline{\tau}^{po}$ from Proposition 3, that the two mechanisms, in general, do not sustain the same set of tax rates. Which of the two mechanisms supports the largest set depends on circumstances, but it is possible for any $\beta > 0$ to find an ego rent $m > M$ such that the set of tax rates that is sustainable by a symmetric political equilibrium is at least as large as the set sustained by a sustainable equilibrium.[14] Moreover, Propositions 2 and 3 show that both mechanisms can sustain the second best (Ramsey) outcome in economies with a sufficiently large discount factor. Importantly, the critical value of the discount factor, $\overline{\beta}^{po}$, required by the electoral accountability mechanism is decreasing in m. An implication, then, is that the second best (Ramsey) tax policy can be sustained as an outcome of a symmetric political equilibrium in any economy with $\beta > 0$ provided that m is large enough. The reputation mechanism cannot replicate this.

6   Discussion of Robustness

The analysis above provides some insights into the role that electoral accountability plays in solving the capital levy problem. Electoral accountability is obviously not the only means by which citizens can prevent excessively high levels of taxation. We have discussed the reputation mechanism at length, but as mentioned in the discussion of the literature, strategic delegation and lob-

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[14] The critical value of the ego rent is

$$M = \left[\frac{\gamma n \left(1 + \chi\right) \beta R}{\left(1 + \chi\right) \left(\gamma n - 1\right) + \beta} \right]^{\frac{1+\chi}{\chi}} \frac{\left(1 - \beta\right) \left(\gamma n - 1\right)}{\beta}.$$

bying against high capital taxes are also likely to play a role. Each of these solutions has their strengths and weaknesses and works better in some environments than in others. Below we discuss in more detail some of the limitations associated with performance voting as a solution to the capital levy problem.

- The capital taxation problem is in a sense a coordination problem: households would like to consume the public good but would rather not share the cost of financing it.[15] Performance voting models assume that voters can coordinate their voting strategies. This makes the analysis open to the critique that we shift the coordination problem from one layer to another: voters cannot coordinate the tax cost, but they can coordinate their voting strategies. The standard formulation of the performance voting model assumes an extreme degree of coordination by focusing on one representative voter who on behalf of all voters sets the constrained efficient performance standard.[16] We relax that assumption and allow individual voters to set their own standard in a non-cooperative manner. This brings to the forefront the flora of possible equilibria and reveals the nature of the coordination problem facing voters: they have to pick among a very large set of equilibria; some with better outcomes than others.[17] We do not have a theory of equilibrium selection, so the best way to view our contribution is that it characterizes the set of outcomes that can be sustained by performance voting in much the same way as Chari and Kehoe (1990) characterize the range of outcomes that can be sustained by history dependent investment and consumption plans. However, it is possible to narrow down the set of equilibria provided one is willing to employ more demanding equilibrium concepts. If, for example, the performance standards announced by voters satisfy the conditions of a strong Nash equilibrium, then, as shown by Dharmapala and Lehman (2004), the

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[15] Drazen (2000, chapters 1 and 4) refers to this as ex post heterogeneity.

[16] In our model that would correspond to setting $\tau^s = \max[\underline{\tau}^{po}, \tau^{sb}]$ each period (see Aidt and Magris (2003) for the details).

[17] It is easy to see that the set of symmetric political equilibria can be Pareto ranked.

unique equilibrium of the game between voters and the politician is the one supported by the median voter subject to compliance by the politician. Applied to our model this means that the unique equilibrium tax rate would be $\tau^{po} = \max[\underline{\tau}^{po}, \tau^{sb}]$.

- In our model, politicians finance the provision of a universal public good by means of a proportional capital tax. The implied restriction on the set of policy instruments is of importance. Recall that the politician only needs to satisfy half the performance standards to get reelected. Therefore, the politician would be seeking out a minimum winning coalition consisting of the "cheapest" voters. Suppose that the politician could make transfers directly to each household or assign household specific tax shares. If so, those in the minimum winning coalition would get preferential treatment and, as a consequence, competition among voters to be in that coalition would start a process of underbidding (see Ferejohn, 1986). Contrast this with the situation in which the politician can only satisfy the demands of voters by providing a universal public good financed by a proportional tax. Since, by definition, everyone benefit from the public good and face the same tax rate, membership of the minimum winning coalition becomes irrelevant for household welfare. This makes it possible, as shown in Proposition 3, to avoid underbidding.[18] An implication, then, is that the set of policy instruments is important for whether or not electoral accountability is effective, and we stress, in particular, that the public good serve a crucial role as an implicit coordination devise (see also Persson and Tabellini, 2000, chapter 9).[19]

- The assumption that households, voters and, in particular, politicians have an infinite time horizon is necessary (but not sufficient) for performance

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[18] This continues to be true if voters differ with respect to their preference for public goods or with respect to the disutility they derive from accumulating human capital (see Aidt and Magris, 2003).

[19] It should be noted, however, that a version of Proposition 3 would hold in the standard Fischer economy (Fischer, 1980) with capital and labour taxes and a fixed budget requirement.

voting to sustain equilibria without complete expropriation. In reality, term limits often apply and when they do, politicians in their last term (the lame ducks) have a strong incentive to misbehave. This problem can, however, be overcome in various ways. One plausible solution, discussed by Alesina and Spear (1988), is to suppose that political parties emerge and that these parties effectively have an infinite time horizon. Suppose, then, that each politician belongs to a party, say A or B. If a particular politician misbehaves e.g., because he is about to retire, then his party, say party A, loses power and a politician from party B is elected. Other politicians in party A can avoid this by setting up an internal incentive mechanism, e.g., by giving the politician a pension upon retirement or access to a well-paid job in the private sector. By setting this reward in the right way the party can stay in power and all politicians within the party behave, even in their last term. We do not provide the details of the analysis here, but note that further analysis of the institutional details that allows citizens in a democracy to overcome the "last period problem" would be of value.

- In our model politicians are perfect substitutes for each other. This has the important implication that voters are indifferent between any two candidates at each election and thus they have no strict incentive to deviate from their announced voting strategy. In reality, politicians differ in many ways and voters would like to select and keep politicians with desirable characteristics. Allowing for such differences complicates the accountability problem and voters need, in general, to resort to more complicated voting strategies along the lines of Banks and Sundaram (1993, 1998). We do not provide an analysis of this here, but note that voters can always get any politician to implement the sequence of tax rates that the "worst" politician is willing to implement. They may well be able to do better than this, however.

7   Concluding Remarks

This paper demonstrates that performance voting may be able to solve the capital levy problem, but only if voters are able to coordinate sufficiently and politicians value office and care about the future. By way of concluding, we highlight some empirical and testable implications of our analysis. In societies where democratic institutions are not fully developed, politicians can, by rigging elections in various ways, avoid being voted out of office in response to poor performance. Formally, this corresponds to situations in which the voting functions have a lower bound, i.e., $min\ \eta(.) > 0$, and suggests that societies with less well-developed democratic institutions will, *ceteris paribus*, have a tendency to resort to expropriating means of taxation. Similarly, voters may have difficulties delivering on their promises in societies with uncertain election turnout and voter apathy. This implies an upper bound on what voters can promise to do, i.e., $max\ \eta(.) < 1$, again making it harder for voters to promote efficient policies. To enhance the effective voice of the electorate, societies may develop specific democratic institutions such as separation of powers or vote of confidence procedures (Persson, Roland and Tabellini, 1997, 2000). Empirically, there is a great deal of cross-county variation in measures of political institutions. Of particular interest here is the index of voice and accountability, constructed by Kaufman et al. (1999). The index ranks countries according to the quality of their democratic institutions, using indicators of democratic accountability, freedom of the press, transparency of decision procedures and so on. Lassen (2001) finds robust evidence that the size of (general) government is positively related to this index of voice and accountability in a sample of 62 democracies in 1995. Becker and Mulligan (2003) finds that the size of government tends to be larger in countries with tax systems that are less distortionary. Our theory predicts a positive relationship between voice and accountability measures and efficient methods of taxation, and thus suggests that the size of government might be affected indirectly by allowing more efficient means of taxation in societies with a well-developed accountability mechanism.

8 Appendix

Proof of Proposition 1. The Ramsey equilibrium requires that for a given sequence of tax rates $\{\tau_t\}_{t=1}^{\infty}$, the effort and consumption decisions of each household $i \in \mathcal{V}$ maximize $\sum_{t=0}^{\infty} \beta^t u(c_{it}, e_{it}; g_t)$ subject to (2) and $(c_{it}, e_{it}) \geq 0$ for all t. The solution to this optimization problem is the same for all households and given by

$$c_t(\tau_t) = [R(1 - \tau_t)]^{\frac{1+\chi}{\chi}} \quad \text{for } t = 0, 1, 2, ...; \tag{21}$$

$$e_t(\tau_t) = [R(1 - \tau_t)]^{\frac{1}{\chi}} \quad \text{for } t = 0, 1, 2, ... \tag{22}$$

Given that, the government selects the sequence of tax rates that maximizes $\sum_{t=0}^{\infty} \beta^t u(c_t(\tau_t), e_t(\tau_t), g_t)$ subject to $g_t(\tau_t) \leq \tau_t R h_t(\tau_t) = \tau_t n R [R(1 - \tau_t)]^{\frac{1}{\chi}}$. The first order conditions are

$$\left[-1 + \gamma n - \frac{\gamma n}{\chi} \frac{\tau_t}{1 - \tau_t} \right] (1 - \tau_t)^{\frac{1}{\chi}} = 0 \quad \text{for } t = 0, 1, ... \tag{23}$$

The solution is given by the expression in equation (5). The second order condition is verified at τ_t^{sb} as $-\left(\frac{\gamma n}{\chi} \frac{1}{(1-\tau^{sb})^2} \right)(1 - \tau_t^{sb})^{\frac{1}{\chi}} < 0$. The other solution $\tau_t = 1$ can be ruled out as it is dominated by $\tau_t = 0$. We note that τ_t^{sb} is stationary $\square$

Proof of Proposition 2. The proposition is an application of Proposition 2 in Chari and Kehoe (1990) which says[20]

Let $a = (c, e)$ be a sequence of consumption and effort plans. An arbitrary pair of sequences (τ, a) is the outcome of a sustainable equilibrium if and only if i) the pair (τ, a) is a competitive equilibrium a time 0 and ii) for every t, the following inequality holds:

$$\sum_{s=t}^{\infty} \beta^{s-t} u(e_s, c_s, g_s) \geq u(e_s, 0, g_s') + \frac{\beta}{1-\beta} u(0, 0, 0) \tag{24}$$

where $g_s' = h_s R$ and $u(0, 0, 0) = 0$.

At time 0, the sequence (τ, a) is a competitive equilibrium if for given $\{\tau_t\}_{t=0}^{\infty}$ households $i \in \mathcal{V}$ maximize $\sum_{t=0}^{\infty} \beta^t u(c_{it}, e_{it}; g_t)$ subject to equation (2) and $(c_{it}, e_{it}) \geq 0$ for all t. This yields the solutions given in equations (21) and (22). Focusing on stationary sequences of taxes, we can write the left-hand side of equation (24) as

$$\frac{\gamma n R \tau \left[R(1-\tau) \right]^{\frac{1}{\chi}} + \frac{\chi [R(1-\tau)]^{\frac{1+\chi}{\chi}}}{1+\chi}}{1-\beta}. \tag{25}$$

Noticing that $u(e_s, 0, g_s') = \gamma n R \left[R(1-\tau) \right]^{\frac{1}{\chi}} - \frac{[R(1-\tau)]^{\frac{1+\chi}{\chi}}}{1+\chi}$, we can rearrange to get equation (6). The critical value $\overline{\beta}$ can be found by substituting τ^{sb} from equation (5) into equation (24) and rearrange $\square$

References

[1] Aidt, T.S. and F. Magris, 2003, Capital Taxation and Electoral Accountability. Cambridge Working Papers in Economics 0318.

[2] Alesina, A., and S. Spear, 1988, An overlapping generations model of electoral competition, Journal of Public Economics 37, 359-379.

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[20] A more detailed demonstration of how the Proposition is applied to our economy is available upon request.

[3] Banks, J., and R.K. Sundaram, 1993, Adverse selection and moral hazard in a repeated election model. In: W. Barnett et al. (eds.), Political economy, institutions, information, competition and representation. Cambridge, UK: Cambridge University Press.

[4] Banks, J., and R.K., Sundaram, 1998, Optimal retention in agency problems, Journal of Economic Theory 82, 293-323.

[5] Becker, G.S. and C.B. Mulligan, 2003, Deadweight costs and the size of government, Journal of Law and Economics 46(2), 293-340.

[6] Barro, R.J., 1973, The control of politicians: an economic model, Public Choice 14, 19-42.

[7] Benhabib, J., and A. Rustichini, 1997, Optimal taxes without commitment, Journal of Economic Theory 77, 231-259.

[8] Bernheim, D., and M. Whinston, 1986, Menu auctions, resource allocation, and economic influence, Quarterly Journal of Economics 101, 1-31.

[9] Chari, V.V., and P.J. Kehoe, 1990, Sustainable plans, Journal of Political Economy 98(4), 783-802.

[10] Coate, S., and S. Morris, 1999, Policy persistence, American Economic Review 89, 1327-1336.

[11] Dharmapala, D., and E. Lehmann, 2004, A median voter theorem for post-electoral politics, Working Papers ERMES 0401, ERMES, University Paris 2.

[12] Drazen, Allan, 2000, Political economy in macroeconomics. Princeton, New Jersey: Princeton University Press.

[13] Dutta, J., Sefton, J., and M. Weale, 1998, Capital taxation and public choice, National Institute, UK, Working paper.

[14] Lassen, D. David, 2001, Political accountability and the size of government: theory and cross-country evidence. Economic Policy Research Unit, University of Copenhagen, Working paper.

[15] Ferejohn, J., 1986, Incumbent performance and electoral control, Public Choice 50(1-3), 5-25.

[16] Fisher, S., 1980, Dynamic inconsistency, cooperation and the benevolent dissembling government, Journal of Economic Dynamics and Control 2, 93-107.

[17] Garfinkel, M.R., and M. Lee, 2000, Political influence and the dynamic consistency of policy, American Economic Review 90(3), 649-666.

[18] Hettich, W., and S.L.D. Winer, 1999, Democratic choice and taxation. A theoretical and empirical analysis. Cambridge, UK: Cambridge University Press.

[19] Jensen, H., 1997, Credibility of optimal monetary delegation, American Economic Review 87(5), 911-920.

[20] Kaufman, D., A. Kraay and P. Zoido-Lobaton, 1999, Aggregating government indicators, World Bank Policy Research Department, Washington, D.C., Working Paper no 2195.

[21] Kydland, F.E., and E.C. Prescott, 1977, Rules rather than discretion: the inconsistency of optimal plans, Journal of Political Economy 85(3), 473-491.

[22] Marceau, N. and M. Smart, 2003, Corporate lobbying and commitment failure in capital taxation, American Economic Review 93(1), 241-251.

[23] McCallum, B.T., 1995, Two fallacies concerning central-bank independence, American Economic Review 85, 207-210.

[24] Nannestad, P., and M. Paldam, 1994, The VP-function: a survey of the literature on vote and popularity functions after 25 years, Public Choice 79(3-4), 213-245.

[25] Persson, T., and G. Tabellini, 1994, Representative democracy and capital taxation, Journal of Public Economics 55, 53-70.

[26] Persson, T., and G. Tabellini, 2000, Political Economics. Explaining Economic Policy, Cambridge, Mass.: MIT Press.

[27] Persson, T., G. Roland and G. Tabellini, 1997, Separation of powers and political accountability, Quarterly Journal of Economics 112, 1163-1202.

[28] Persson, T., G. Roland and G. Tabellini, 2000, Comparative politics and public finance, Journal of Political Economy 108, 1121-1141.

9 Extended Proof of Proposition 2

Proof of Proposition 2. (long version, not intended for publication) The proposition is an application of Proposition 2 in Chari and Kehoe (1990). Since households are identical we save on notation by dropping the sub-script i. To state the Proposition precisely, we, however, need to introduce some new notation. Let $H_{t-1} = \{ \tau_s \,|\, s = 0, 1, ..., t-1 \}$ and $H_t = \{H_{t-1}, \tau_t\}$ be the history facing agents at the first and second stage of period t, respectively. Let $e(H_{t-1})$ be the decision rules chosen by households in period t as a function of first-stage history. Along with this they choose a complete contingency plan that specifies for all possible future histories the effort choice. After the effort decision has been made the government sets the time t tax $\tau_t(H_{t-1})$ along with a contingency plan that specifies tax rates for all possible future histories. In the second stage, households face history H_t and choose the consumption allocation $c_t(H_t)$ along with a contingency plan that specifies the consumption allocation for all possible future histories. Let $A_t = \{e_s(.), c_s(.)\}_{s=t}^{\infty}$ be the continuation of the sequence of allocation plans A_0 and $\varsigma_t = \{\tau_s(.)\}_{s=t}^{\infty}$ be the continuation of the sequence of policy plans ς_0 for all $s > t$. Then, we can define a sustainable equilibrium as follows. A *sustainable equilibrium* is a pair (A_0, ς_0) that satisfies the following conditions: i) given the policy plan ς_0, the continuation of the allocation rule A_0 specifies a sequence of effort decisions that maximizes household utility for every history H_{t-1} and a sequence of consumption choices that maximizes household utility for every history H_t; ii) given the allocation rule A_0, the continuation of ς_0 maximizes $\sum_{s=t}^{\infty} \beta^s u(c_s(H_s), e_s(H_{s-1}), g_s(H_{s-1}))$ subject to $g_s(H_{s-1}) = \tau_s(H_{s-1}) R h_s(H_{s-1})$. A particular sequence of taxes and allocations (τ, a) starting at time $t = 0$ is called the outcome induced by a sustainable equilibrium if it satisfies the two conditions above.

The characterization of sustainable outcomes is based on the following plans, called revert-to-static plans. For an arbitrary sequence (τ, a), revert-to-static plans specifies the continuation with (τ, a) as long as this plan has been followed in the past. If there ever was a deviation, the government sets $\tau = 1$ there after.

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For households the allocation rule specifies that they set $c = 0$ immediately after the deviation and use the static allocation rule $e = c = 0$ in all subsequence periods. Proposition 2 in Chari and Kehoe (1990) says:

Let $a = (c, e)$ a sequence of consumption and effort plans. An arbitrary pair of sequences (τ, a) is the outcome of a sustainable equilibrium if and only if i) the pair (τ, a) is a competitive equilibrium a time 0 and ii) for every t, the following inequality holds:

$$\sum_{s=t}^{\infty} \beta^{s-t} u(e_s, c_s, g_s) \geq u(e_s, 0, g'_s) + \frac{\beta}{1-\beta} u(0,0,0) \tag{26}$$

where $g'_s = h_s R$ and $u(0,0,0) = 0$.

At time 0, the sequence (τ, a) is a competitive equilibrium if for given $\{\tau_t\}_{t=0}^{\infty}$ households maximize $\sum_{t=0}^{\infty} \beta^t u(c_t, e_t; g_t)$ subject to (2) and $(c_t, e_t) \geq 0$ for all t. This yields the solutions given in equations (21) and (22). Focusing on stationary sequences of taxes, we can write the left-hand side of equation (26) as

$$\frac{\gamma n R \tau \left[R\left(1-\tau\right)\right]^{\frac{1}{\chi}} + \frac{\chi [R(1-\tau)]^{\frac{1+\chi}{\chi}}}{1+\chi}}{1-\beta}. \tag{27}$$

Noticing that $u(e_s, 0, g'_s) = \gamma n R \left[R\left(1-\tau\right)\right]^{\frac{1}{\chi}} - \frac{[R(1-\tau)]^{\frac{1+\chi}{\chi}}}{1+\chi}$, we can rearrange to get equation (6). The critical value $\overline{\beta}$ can be found by substituting τ^{sb} from equation (5) into equation (24) and rearrange ∎

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