Weak States And Steady States: The Dynamics of Fiscal Capacity*

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Abstract

Investments in fiscal capacity – economic institutions for tax compliance – are an important feature of economic development. This paper develops a dynamic model to study such investments and their evolution over time. We contrast a social planner's investment path with paths where political constraints are important. Three types of states emerge in the long run: (1) a common-interest state where public resources are devoted to public goods, (2) a redistributive state where additional fiscal capacity is used for transfers, and (3) a weak state with no transfers and a low level of public goods provision. The paper characterizes the conditions under which each possibility emerges and comparative statics wihin each regime.

*We are very grateful for the comments of Marco Battaglini who also discovered some errors in a first version of the paper.

1 Introduction

The growth of the state and its capacity to extract significant revenues from its citizens is one of the most striking features of the economic history over the last two centuries. For example, Maddison (2001) documents that on average France, Germany, the Netherlands and the UK raised around 12% of GDP in tax revenue around 1910 and around 46% by the turn of the Millennium. The corresponding U.S. figures are 8% and 30%. Underpinning these hikes in revenue are a number of tax innovations, including the extension of the income tax to a wide population. To improve compliance, this required not only building a tax administration but also implementing withholding at source. Such investments in the state have enabled the kind of mass taxation now considered normal throughout the developed world.[1]

Figure 1 gives a very partial picture of fiscal-capacity investments *over time.* It plots the distribution of three kinds of investments for a sample of 22 countries since 1800. Red lines demarcate the introduction of the income tax, blue lines the introduction of income-tax withholding and green lines whether or not a country has a VAT. Although the sample is limited, it illustrates clearly how such investments have evolved over time. Income taxes began appearing in the middle of the 19th century and are fully prevalent in the sample in the interwar period. Withholding followed somewhat later and was not complete until after World War II. VAT was lagging further behind, with adoption still incomplete by the end of the 20th century.

However, the experience of the richest countries gives a very incomplete picture. On the whole, poor countries have much lower tax intakes in GDP and also tend to raise a larger share of their taxes from tax bases such as trade that require relatively less intense monitoring compliance than broad income. Figures 2 and 3 illustrate the variation *over countries* in the shares of total government revenue raised by trade taxes and income taxes, respectively, during the period 1975-2000 for countries at three different levels of tax intake and three different levels of development. Clearly, the world is populated by a number of weak states that have yet to build their fiscal capacity in the way rich and high-taxing countries have done. In fact, the notion of weak states is becoming a salient theme in economic development – see, for example, Migdal (1988) and Acemoglu (2005). It is now widely acknowledged that

[1] See Slemrod and Yitzhaki (1997) for a review of the compliance literature in public finance.

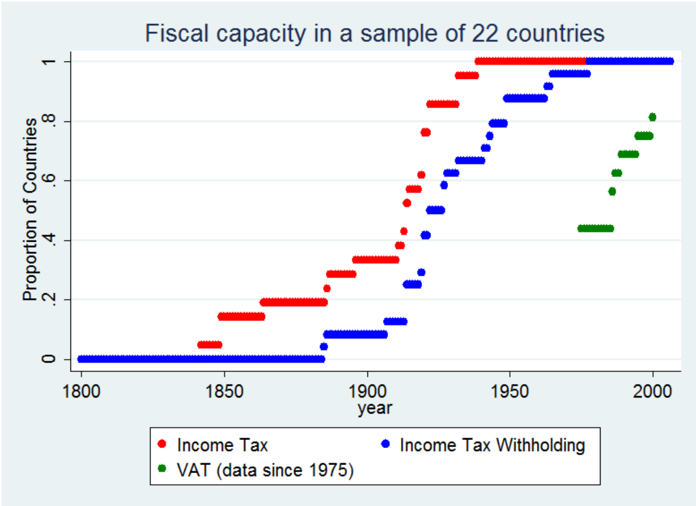

Figure 1: Fiscal Capacity Investments

understanding persistent weakness requires a political-economics approach, where government incentives play a central role.

In spite of its practical importance, little research has been done in economics on investments to improve the working of the state. Most public-finance models focus on the allocation of given tax raising powers, while the development of such powers is rarely studied in public finance. Instead, most of the work on long-term investments in the state has been left to historians, such as historical sociologist Charles Tilly (see, e.g., Tilly, 1990). He is particularly well-known for his work on European exceptionalism in building strong states, arguing that war is a key influence in state development.[2]

This paper studies a basic model of fiscal-capacity investments. Our model has two groups, one of which is in power in each period. An incumbent government decides on three things: public goods, transfers and investments in future fiscal capacity. It faces an institutional constraint on its ability to discriminate transfer payments between the two groups. An exogenously given turnover parameter determines the probability that the incumbent group will maintain its power until the next period.

In this framework, we build on earlier work – especially by Besley and Persson (2009, 2010) – on how politics and institutions shape investments in

[2] See also Brewer (1989) and Hoffman and Rosenthal (1997).

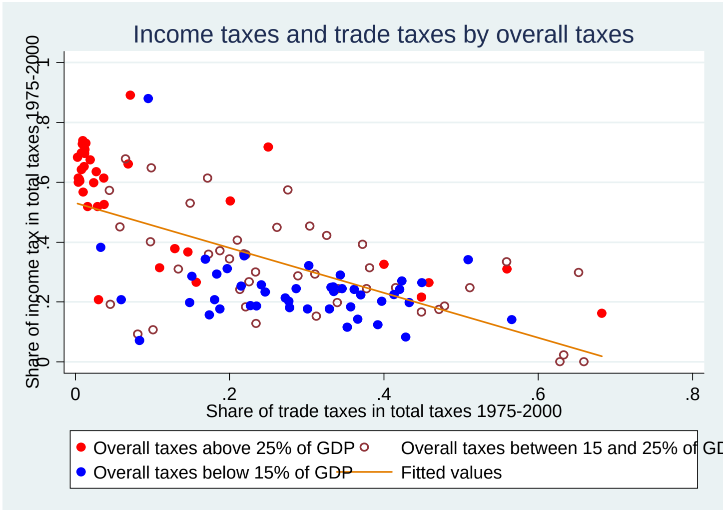

Figure 2: Income Taxes and Tariffs: I

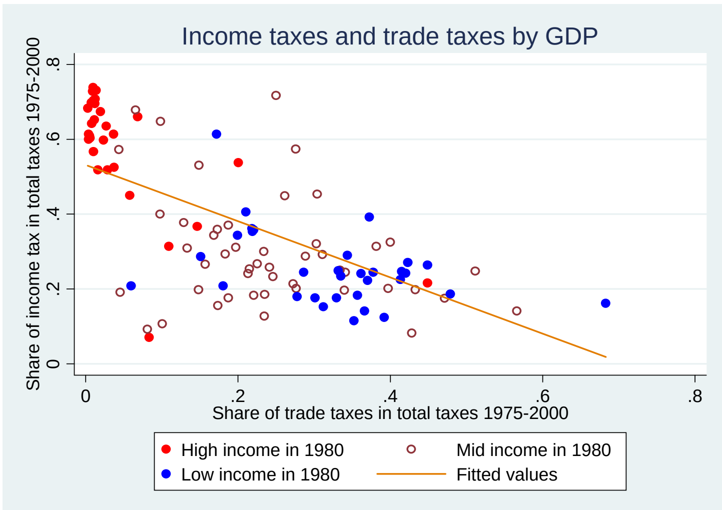

Figure 3: Income Taxes and Tariffs: II

state capacity. But this earlier work was confined to a two-period setting and thus limited in its scope to predict the long-run evolution of state capacity. By contrast, the infinite-horizon model developed in this paper helps to cast light on how the dynamics might lead to different patterns of long-run state development.

To home in the role of politics, we introduce only two "political frictions". One is the extent to which these decisions are non-cohesive (due to a lack of checks and balances); the other is the extent to which they are shortsighted (due to a high rate of political turnover). We show how these frictions influence the path of the economy in comparison to a benevolent planner's desired path of state development. It turns out that even small frictions can yield very interesting dynamics.

While different in its motivation and its scope, our paper has a model that shares a number of its features with the one in Battaglini and Coate (2007). Moreover, like their dynamic model, our dynamic model has three possible steady states, which are associated with different compositions and levels of government spending.

In particular, three kinds of states may emerge in the long run. If institutions are cohesive, state investments parallel the path chosen by a Pigovian planner who maximizes social welfare. The state strengthens its fiscal powers over time and use the higher revenue to expand the provision of public goods. Because the demand for such common-interest spending drives the ultimate size of the state and investments in tax raising power, we refer to this as a common-interest state.

If political institutions lack the cohesion of a common-interest state, there are two possibilities. When the polity is stable, the state grows to a point where it has maximized state capacity. On its way there, however, the state becomes a vehicle for redistribution towards incumbent groups. The steady-state size of the state is not pinned down by the importance of common interests, and we refer to this as a redistributive state.

If the lack of cohesion goes hand in hand with political instability, however, the steady state once again does not permit any redistribution. But now the equilibrium state is smaller in size and provides socially sub-optimal levels of public goods at all times. We refer to this as a weak state.

The paper contributes to a burgeoning literature on dynamic public finance and political economy.[3] Increasingly, these models recognize that

[3] See Golosov et al [2006] for a survey of the normative literature.

political issues may be important in understanding policy over time. Recently, Acemoglu et al (2008, 2009), Azzimonti (2009), Battaglini and Coate (2008), Lagunoff and Bai (2010), and Song, Storesletten and Zilibotti (2008). amongst others, have enhanced our understanding of dynamic political equilibria when governments turn over. This work typically relies on the notion of Markov Perfect dynamic political equilibrium developed in Krusell, Quadrini and Rios-Rull (1996). All of these papers, in turn, build on the literature on strategic public debt by Aghion and Bolton (1990), Alesina and Tabellini (1990) and Persson and Svensson (1989), who studied strategic debt issue in the presence of political turnover. Differently from the previous literature, our emphasis here is on the accumulation of specific capital which facilitates the ability to raise future taxes.

The remainder of the paper is organized as follows. Section 2 formulates our model, while Section 3 characterizes its equilibrium. Section 4 describes the Pigovian benchmark of a fully stable and consensual political system, and Section 5 contrasts this benchmark with an economy facing political frictions, characterizing and discussing equilibria in three possible regimes. Section 6 concludes. Proofs and some mathematical derivations are relegated to the appendix.

2 The Model

This section lays out the model and discusses its core assumptions.

Basics The population of an economy is divided into two groups: A and B. Each group comprises one half of the population. There is discrete time with an infinite horizon, where time periods are denoted by $s = \{1, 2, ...\}$. At any given date s, one group is the incumbent government, denoted by $I_s \in \{A, B\}$. The other group makes up the opposition, denoted by $O_s \in \{A, B\}$. At the beginning of each period, there is an exogenous probability γ of a peaceful transition of power so that $I_s \neq I_{s-1}$. With probability $1-\gamma$ the incumbent remains in power so that $I_s = I_{s-1}$. These probabilities are independently and identically distributed over time according to parameter γ.

Preferences and Production Opportunities Individuals begin each period with income ω which can be costlessly transformed into either private consumption or a public good. In each period s, individuals in group J value their own private consumption x_s^J and the (non-durable) public good g_s according to the quasi-linear function:

$$\alpha V(g_s) + x_s^J \ , \tag{1}$$

where $V(\cdot)$ is an increasing, twice-differentiable concave function, which satisfies the usual Inada conditions. Individuals do not discount future utility relative to current utility.

Parameter α shapes the marginal value of public goods. It parametrizes common interests and, could, for example, represent an external threat which requires spending on an army.

Policies and Institutions An incumbent enters period s with an accumulated stock of fiscal capacity τ_s. Variable τ_s represents the maximal share of private income that can be taxed away, or simply *fiscal capacity.* It has an upper bound $\bar{\tau} < 1$, which may be interpreted as the highest technologically feasible tax rate (as opposed to the highest institutionally feasible tax rate, which is τ_s). In a slightly richer model, $\bar{\tau}$ could be the peak of the Laffer curve. We assume that fiscal capacity depreciates at rate δ in each period and that the investment cost for one unit of fiscal capacity is constant at c. Throughout, we make:

Assumption 1: $\omega > 2c\delta$.

This will hold as long as the cost of maintaining the current stock of fiscal capacity is low enough relative to the existing per-capita endowment.

In each period, the incumbent makes tax and spending decisions. She chooses a feasible tax rate $t_s < \tau_s$, which is non-discriminatory across groups, and divides the resulting revenue between public goods g_s, state capacity investments $\tau_{s+1} - \tau_s(1-\delta)$, and non-negative transfers. The per-capita transfer to the incumbent's group in period s is r_s^I while that to the opposition group is r_s^O.

We assume that political institutions constrain the degree to which these transfers can discriminate between the two groups. Specifically, incumbents are institutionally required to transfer at least $\sigma \in [0,1]$ units of consumption to the opposition for each unit of consumption they transfer to their own group. This gives the following constraint:

$$r_s^O \geq \sigma r_s^I \ .$$

It will be useful to work with parameter $\theta = \frac{\sigma}{1+\sigma} \in [0, 1/2]$. Throughout, we interpret a higher value of the opposition's share of transfers, θ, as reflecting more representative, or consensual, political institutions. Real-world counterparts of a high θ may be e.g., more minority protection through a system of constitutional checks and balances, or more equal representation though a proportional electoral system. If $\theta = 1/2$, then transfers are shared equally across the two groups.

Within-period policy Incumbents are fully representative of their group, putting equal weight on the welfare of all group members. A budget in period s is a tax rate, t_s, a level of public good provision g_s, a pair of transfers $\left\{r_s^I, r_s^O\right\}$ and a future level of state capacity τ_{s+1}. The government budget constraint is:

$$t_s \omega \geq g_s + c\left(\tau_{s+1} - (1-\delta)\tau_s\right) + \frac{r_s^I + r_s^O}{2} \ , \tag{2}$$

where the left-hand side is tax revenue and the right-hand side is public spending.

Solving for the transfer levels to each group is straightforward. Any incumbent will set the highest feasible transfer to her own group and the lowest feasible transfer to the opposition. Using the institutional constraint and (2), this implies:

$$x_s^J = (1-\tau_s)\,\omega + r_s^J = (1-\tau_s)\,\omega + \beta^J\left[t_s\omega - g_s - c\left(\tau_{s+1} - (1-\delta)\tau_s\right)\right] \ , \tag{3}$$

where $\beta^I = 2(1-\theta)$ and $\beta^O = 2\theta$. Since $\beta^I \geq 1$, the incumbent group maximizes its private consumption, given public goods and fiscal capacity investments, by setting $t_s = \tau_s$.

Given an inherited level of fiscal capacity τ_s, we can now write the indirect utility of group J in period s as:

$$\begin{aligned} W\left(\tau_s, g_s, \tau_{s+1}, \beta^J\right) &= \alpha V(g_s) + \beta^J\left[\tau_s\omega - g_s - c\left(\tau_{s+1} - (1-\delta)\tau_s\right)\right] \\ &\quad + (1-\tau_s)\,\omega \ . \end{aligned} \tag{4}$$

Dynamic Optimization We will study a Markovian decision problem of the incumbent, where τ is the single state variable (conditional on the group that holds power), using a particular equilibrium concept detailed below.

Using (4), we can formalize the incumbent's policy problem as a dynamic optimization problem. Let $U^J(\tau)$ be the net present value of lifetime utility of group J entering a period with state capacity τ, where $J \in \{I, O\}$. The value function of the incumbent, $U^I(\tau)$, can be defined recursively from:

$$U^I(\tau) = \max_{\tau', g} \left[W(\tau, g, \tau', 2(1-\theta)) + (1-\gamma) U^I(\tau') + \gamma U^O(\tau') \right] \tag{5}$$

$$\text{subject to } \omega\tau \geq g + c(\tau' - (1-\delta)\tau) \tag{6}$$

$$\text{and } \tau' \leq \bar{\tau} \ . \tag{7}$$

From now on, we thus suppress time subscripts and let τ' denote the state capacity left for the following period.

We denote the policy functions that solve the incumbent's problem by $T(\tau)$ and $G(\tau)$. Using these, the opposition's value function can also be defined recursively from:

$$U^O(\tau) = W(\tau, G(\tau), T(\tau), 2\theta) + \gamma U^I(T(\tau)) + (1-\gamma) U^O(T(\tau)) \ . \tag{8}$$

This expression recognizes that policy is governed by $G(\tau)$ and $T(\tau)$, and that political power alternates with probability γ of the opposition becoming the next government.

Equilibrium Armed with these preliminaries, we can define our equilibrium concept, which makes two substantive restrictions on equilibrium behavior over and above the standard notion of Markov perfection. First, we impose symmetry: both groups use the same $\{G(\tau), T(\tau)\}$ strategies. Second, we require that these functions are differentiable almost everywhere. Formally, we state:

Definition: *A **Differentiable Symmetric Markov Perfect Equilibrium** (DSMPE) of the dynamic state capacity game is a set of functions $U^I(\tau)$, $U^O(\tau)$, $G(\tau)$ and $T(\tau)$, with at most one point of non-differentiability, satisfying the following conditions:*

1. *$U^I(\tau)$ satisfies (5) to (7).*
2. *$G(\tau)$ and $T(\tau)$ are the solutions for G and τ' in the maximization problem (5) to (7).*
3. *$U^O(\tau)$ is given by (8).*

4. *The single point of non-differentiability is at the value of* τ *such that (6) holds with equality, but without constraining the incumbent's choice of* g *and* τ'*.*

Our main interest is in the paths of policy that satisfy these conditions, i.e., the properties of the policy functions $G(\tau)$ and $T(\tau)$ along the equilibrium path. We now turn to the study of these.

3 Characterization of the Equilibrium

First, we observe that the first-order conditions for g and τ' of the incumbent's problem defined by (5) to (7) are given by:

$$\alpha V_g(g) = \lambda + 2(1-\theta) \ , \tag{9}$$

and

$$c\alpha V_g(g) \leq (1-\gamma) U_\tau^I(\tau') + \gamma U_\tau^O(\tau') \ , \tag{10}$$

where λ is the Lagrange multiplier on (6). Equation (10) holds with equality as long as (7) is not binding.

Note that $\lambda = 0$ whenever the public good is at $\hat{g}$ defined by:

$$\alpha V_g(\hat{g}) = 2(1-\theta) \ . \tag{11}$$

This is true because public-goods demand never exceeds $\hat{g}$, since the marginal value would be less than the value of increasing transfers to the incumbent group. Observe that if $\theta = 1/2$, then $\hat{g}$ is at the Lindahl-Samuelson optimum for the public good. If $g < \hat{g}$, then g is determined by (6) holding with equality. In this case, the non-negativity constraint on transfers is binding and the incumbent allocates *all* tax revenues to public good provision or accumulation of fiscal capacity.

Using the first-order conditions, the envelope theorem on (5), and differentiating (8) with respect to τ, the *DSMPE* can be described as follows.[4]

There is a cutoff point $\tau = \hat{\tau}$, at which government expenditures coincide with $\hat{g}$, as defined in (11). Above $\hat{\tau}$, the incumbent optimally makes transfers and we will therefore refer to such a situation as a *redistributive regime.* If, on the other hand, $\tau < \hat{\tau}$, transfers are zero and public goods are provided

[4] A full derivation is available in Appendix A.

at a lower level $g < \hat{g}$, given by (6) holding with equality. To capture this fact, we call such a situation a *common-interest regime.*

State capacity evolves according to a Generalized Euler Equation (GEE). This is a non-linear second-order difference equation, which is discontinuous at $\tau = \hat{\tau}$. For ease of notation, we split this equation into two, the first holding for choices of $\tau' \geq \hat{\tau}$ and the second holding for $\tau' < \hat{\tau}$. When $\tau' \geq \hat{\tau}$, then:

$$\begin{aligned} c\alpha V_g(g) &= 2(1-\theta)(1-\gamma)[\omega + c(1-\delta)] - \omega \\ &\quad +2\gamma\theta[\omega + c(1-\delta) - cT_\tau(\tau')] \\ &\quad -(1-\gamma)[\alpha V_g(g'')(\omega + c(1-\delta)) - \omega - 2(1-\theta)c]T_\tau(\tau') \\ &\quad +\gamma[\alpha V_g(g'')(\omega + c(1-\delta)) - \omega - 2\theta c]T_\tau(\tau') \ . \end{aligned} \tag{12}$$

And when $\tau' < \hat{\tau}$, then:

$$\begin{aligned} c\alpha V_g(g) &= \alpha V_g(g')[\omega + c(1-\delta)] - \omega \\ &\quad -(1-\gamma)[\alpha V_g(g'')(\omega + c(1-\delta)) - \omega - c\alpha V_g(g')]T_\tau(\tau') \\ &\quad +\gamma[\alpha V_g(g'')(\omega + c(1-\delta)) - \omega - c\alpha V_g(g')]T_\tau(\tau') \ . \end{aligned} \tag{13}$$

Although seemingly complex, these equations are quite intuitive.

In both cases, the left-hand side represents the opportunity cost of accumulating state capacity. In a common-interest regime, the c units of tax revenue that additional state capacity costs can alternatively be used to raise public-goods provision by one unit. The same opportunity cost applies, even if the c units of tax revenue go to transfers, as (11) indicates that the incumbent equates the marginal value of transfers to the marginal value of public goods.

The right-hand side of (12) and (13) give the marginal value of an additional unit of state capacity. In the redistributive regime, the incumbent is accumulating enough state capacity to ensure that her successor provides the public good to its cutoff level, and enables transfers to be realized in the following period. In the common-interest regime, the incumbent is accumulating less state capacity and ensures that her successor does not provide transfers.

Specifically, the first two lines in (12) and the first line in (13) give the direct net marginal value of fiscal-capacity accumulation. In the first redistributive case, fiscal capacity gives additional revenues for the purpose of transfers. With probability $1-\gamma$ the incumbent will retain power and obtain a portion $1-\theta$ of these transfers. With probability γ the incumbent will be replaced by the opposition leaving her with a share of only θ of these transfers. In the second common-interest case, the additional revenues are allocated to public-good provision, regardless of who is in power in the following period. In both cases, the additional tax revenues cause a marginal loss of ω units of private consumption.

The last two lines of both equations represent the ability of incumbents to affect their successors' behavior, in analogy with the strategic debt literature referred to above.[5] In a related context, Azzimonti (2009) refers to this effect as the "incumbency advantage". The term $T_\tau(\tau')$ reflects the additional state capacity the incumbent induces her successor to accumulate for two periods hence, through the current accumulation of additional state capacity one period hence. The terms in square brackets reflect wedges in the intertemporal choice of state capacity from one period in the future to two periods in the future. Such wedges might exist because the successor may not accumulate state capacity optimally from the perspective of the incumbent: if a wedge is positive (negative), the successor is over-accumulating (under-accumulating) state capacity. If additional state capacity induces the successor to accumulate more state capacity ($T_\tau(\tau') > 0$), the incumbent may choose to accumulate less state capacity than she would otherwise do, thus encouraging her successor to accumulate less state capacity and reducing the intertemporal wedge. However, the prospective benefit of influencing the opposition if it takes over (the last line of each equation) needs to be weighed against the cost of influencing the incumbent's own behavior if she remains in power (the penultimate line of each equation).

To clarify the political economy of state capacity in this framework, we need to study the implications of (12) and (13) for decision making by the incumbent. The game at hand is not a traditional dynamic programming problem; determining the steady states requires knowledge of the decision rule $\tau' = T(\tau)$ over the entire state space – and not only at the steady state. Before turning to this, we analyze the benchmark under Pigovian planning.

[5] See Persson and Svensson (1989), Alesina and Tabellini (1990) and Aghion and Bolton (1990) for the initial constributions.

4 The Pigovian Benchmark

To approach the Pigovian solution in this setting, we postulate $\theta = \frac{1}{2}$ and $\gamma = 0$. In other words, the planner values each group equally – the equivalent of fully cohesive institutions in our model – and she is not replaced. The resulting problem boils down to a more or less standard dynamic programming problem, with the value function (5) written as:

$$U^I(\tau) = \max_{\tau', g} \left\{ \alpha V(g) + \omega(1-\tau) - g - c(\tau' - (1-\delta)\tau) + U^I(\tau') \right\}$$
$$\text{subject to} \quad \omega\tau \geq g + c(\tau' - (1-\delta)\tau) \ .$$

The solution is given in Proposition 1.

Proposition 1 *An economy governed by a Pigovian planner ($\gamma = 0$, $\theta = \frac{1}{2}$) has a unique steady state with public good provision and fiscal capacity*

$$\alpha V_g(g^*) = \frac{\omega}{\omega - c\delta} > 1 \quad \text{and} \quad \tau^* = \frac{g^*}{\omega - c\delta} < \hat{\tau} \ .$$

This steady state is globally stable. The economy cannot be in the redistributive regime for any period $s > 0$. If $\tau_0 > \hat{\tau}$, the cutoff point between the common-interest and redistributive regimes, the economy immediately jumps to $\tau_1 < \hat{\tau}$.

Proof. Appendix B ■

The steady-state level of public goods is determined by the cost of fiscal capacity and the value of public goods, α. If fiscal capacity were costless, the planner would accumulate sufficient fiscal capacity to fund the Lindahl-Samuelson optimal level of public goods. However, that level of public goods requires recurrent expenditures to maintain the necessary stock of fiscal capacity. We can interpret $c\delta$ as the incremental cost of maintaining the quality of the state. Public goods are thus provided below the Lindahl-Samuelson prescription in the long run. In the steady state, investment in fiscal capacity is sufficient to support such public-goods provision but no transfers are provided.

Cross-sectionally, the planning solution would predict a larger steady-state government whenever common interests and the demand for public goods (α) are stronger, private productivity (ω) is higher, and the costs of fiscal capacity investment (c) or depreciation of fiscal capacity (δ) is lower.

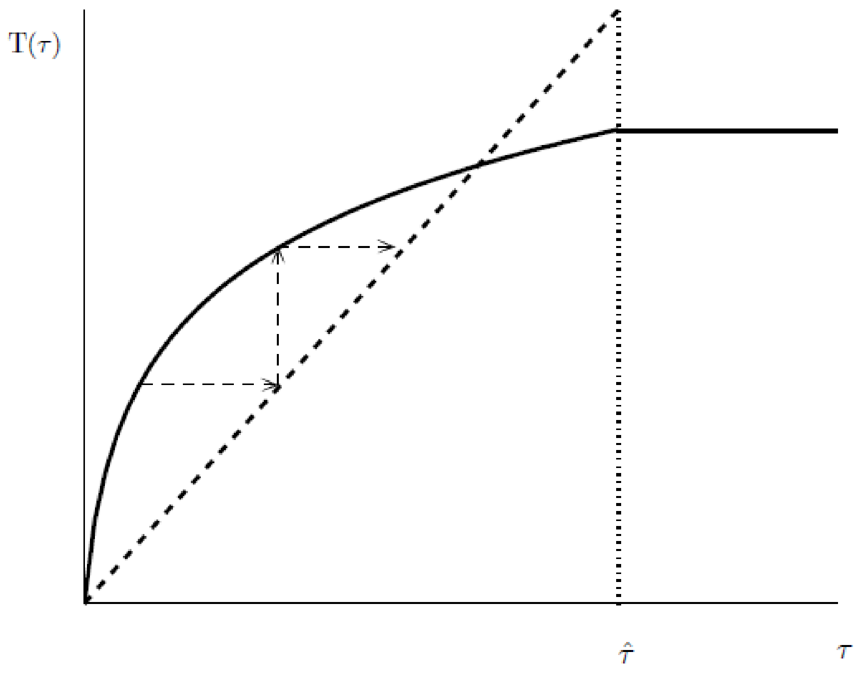

Figure 4: The Pigovian Benchmark

The dynamics of the planning solution are simple. An economy with an initial level below τ^* converges to this level from below. If it begins above τ^*, then the economy cannot be in the redistributive regime for longer than a single period. In that regime, fiscal capacity is so high that the government can provide public goods at the Lindahl-Samuelson level defined by $\alpha V_g(\hat{g}) = 1$, and tax at an even higher rate than necessary. Because fiscal capacity is reversible and can be transformed into private consumption, the planner finds it optimal to rebate fiscal capacity back to citizens by an equal transfer to each group and revert to the common-interest regime.

Figure 4 illustrates the time path of the economy. It plots the decision rule $\tau_{s+1} = T(\tau_s)$. We see that state capacity converges to τ^*.

5 Political Economy

Having analyzed the Pigovian benchmark, we now show that when $\theta < 1/2$ and $\gamma > 0$ there are three possible long-run outcomes, one of which mirrors the planning outcome. Two key conditions on the underlying primitives turn out to govern the behavior of the economy over time. We introduce these conditions here and show how they affect the outcome below.

The Cohesiveness Condition: $2(1-\theta) \leq \frac{\omega}{\omega - c\delta}$

As the right-hand side of this condition is above unity, it will hold as long as θ is close enough to one half – i.e., political institutions are sufficiently cohesive. Given Assumption 1, the condition will fail for θ close enough to zero. It will tend to hold, when c and δ are large, which means that a low demand for public goods, all else equal. The second condition is:

The Stability Condition: $(1-\gamma)(1-2\theta) + \theta > \frac{(1-\theta)c + \frac{\omega}{2}}{c(1-\delta) + \omega}$

This will hold only if θ and/or γ is close enough to zero – i.e., when political institutions are not very cohesive, there has to be sufficient political stability. Hence, the Stability Condition is relevant only when the Cohesiveness Condition fails. Figure 5 shows the parameter values when these conditions pass of fail in $(1-\gamma, \theta)$ space. The Cohesiveness Condition is described by a vertical line. But the Stability Condition is described by an upward-sloping curve, which starts from a positive value of $1-\gamma$ at $\theta = 0$ (by Assumption 1) and coincides with the Cohesiveness Condition as $1-\gamma$ reaches a value of 1 (i.e., as γ goes to 0).

In what follows, we show that there is a steady state if *either* the Cohesiveness Condition *or* the Stability Condition holds: as Figure 5 shows, both conditions cannot hold simultaneously. If the Cohesiveness Condition holds, we have a common-interest steady state, while we have a redistributive steady state if the Stability Condition holds. When *neither* the Cohesiveness *nor* the Stability Condition hold, there is a steady state with neither redistribution nor optimal public good provision. We refer to this as a weak state, since political institutions are non-cohesive and political turnover is high. These three possible long-run outcomes correspond to the three sets of parameter constellations depicted in Figure 5.

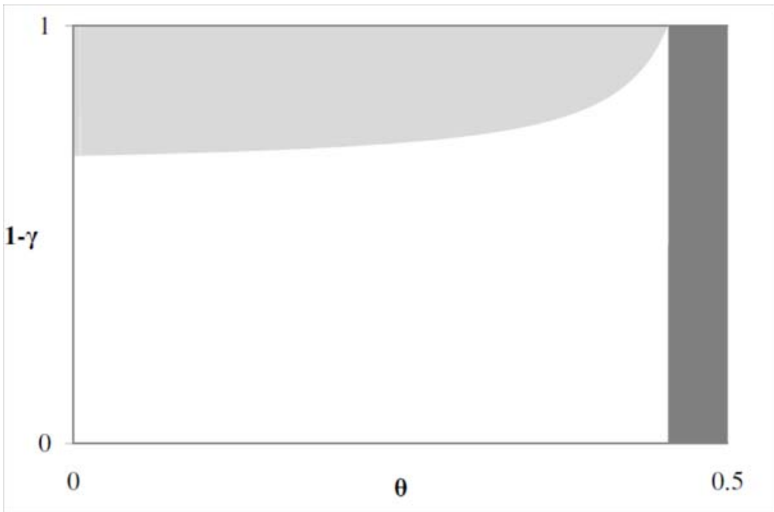

Figure 5: Steady states for different political parameters

5.1 A Common-Interest Steady State

To analyze the steady states, let $\left\{g^{SS}, \tau^{SS}\right\}$ denote the steady-state levels of public goods spending and fiscal capacity. A common-interest steady state, $SS = C$, has $\tau^C < \hat{\tau}$ and $\alpha V_g\left(g^C\right) > 2\left(1-\theta\right)$. Imposing steady state on (13) yields:

$$\alpha V_g\left(\tau^C\left(\omega - c\delta\right)\right)\left(\omega - c\delta\right)\left[\left(1-2\gamma\right)T_\tau\left(\tau^C\right) - 1\right] = \omega\left[\left(1-2\gamma\right)T_\tau\left(\tau^C\right) - 1\right]. \tag{14}$$

Assuming $T_\tau\left(\tau^C\right) \neq \frac{1}{1-2\gamma}$[6], this implies:

$$\alpha V_g\left(\tau^C\left(\omega - \delta c\right)\right) = \frac{\omega}{\omega - c\delta}. \tag{15}$$

This steady state exists, therefore, only if the Cohesiveness Condition holds. Otherwise, $\alpha V_g\left(g^C\right) \leq 2\left(1-\theta\right)$, which contradicts the assumption that the steady state is in the common-interest regime.

We conjecture and then verify that an equilibrium path exists along which incumbents believe their successors will behave in a socially optimal manner in their choice of τ' whenever $\tau < \hat{\tau}$, and that this belief is confirmed in equilibrium.

[6] The case $T_\tau\left(\tau^C\right) = \frac{1}{1-2\gamma}$ is explored in more detail in the appendix.

Socially optimal behavior implies

$$c\alpha V_g(g) = \alpha V_g(g')[\omega + c(1-\delta)] - \omega. \tag{16}$$

Incumbents, knowing that they will not have access to redistributive transfers, behave as social welfare maximizers in the belief that their successors will also behave as social welfare maximizers, regardless of their identity. This belief is realized in a symmetric equilibrium, as summarized in Proposition 2.

Proposition 2 *If the Cohesiveness Condition holds, a common-interest steady state exists, which solves (15) and is equal to the Pigovian solution described in Proposition 1. This steady state with $\tau^C = \tau^*$is unique and globally stable. An economy beginning at any level of state capacity will converge to the common interest steady state and may remain in a redistributive regime for no longer than one consecutive period.*

Proof. Appendix B ■

In effect, this path is identical to the path a Pigovian planner would follow. Thus, we do not require $\theta = 1/2$ and $\gamma = 0$, but only the weaker Cohesiveness Condition, for the planning solution to be implemented. At the Pigovian level of public goods, no incumbent government would wish to divert resources towards transfers. Since fiscal capacity is costly and depreciates, this level of public goods is less than the Lindahl-Samuelson optimum and hence a fully benevolent government is not necessary to sustain the planner's solution. Because fiscal capacity is costly to maintain – i.e., the tax system has recurrent compliance costs – the planning outcome becomes sustainable as a political outcome if θ is close enough to $\frac{1}{2}$.

As a result, the within-regime comparative statics from the last subsection are valid also here. In particular, amongst countries in the common-interest regime, we should see higher long-run fiscal capacity the higher is the demand for public goods and the richer is the economy, *ceteris paribus.*

5.2 A Redistributive Steady State

Next, consider a steady state, $SS = R$, where the economy is in the redistributive regime indefinitely with $\tau^R > \hat{\tau}$. We impose steady state on (12),

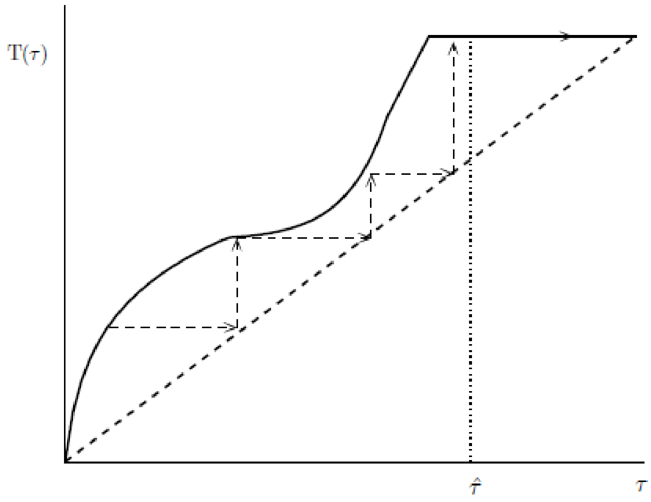

Figure 6: A redistributive state.

allowing for the possibility that the inequality in (7) is binding to get:

$$\begin{aligned} & 2(1-\theta)\left[c-(1-\gamma)(\omega+c(1-\delta))\right]-2\gamma\theta(\omega+c(1-\delta))+\omega \\ \leq \; & \left\{2(1-\theta)(1-\gamma)c-2\gamma\theta c-(1-2\gamma)\left[2(1-\theta)(\omega+c(1-\delta))-\omega\right]\right\}T_\tau\left(\tau^R\right). \end{aligned} \tag{17}$$

This condition holds with strict inequality only if $\tau^R = \bar{\tau}$, which is the only redistributive steady state. If this occurs, $T_\tau\left(\tau^R\right) = 0$ and (17) is equivalent to the Stability Condition.

Suppose the Stability Condition holds, which is sufficient for a redistributive steady state with $\tau^R = \bar{\tau}$. We now show:

Proposition 3 *If the Stability Condition holds, then the unique steady state is $\tau^R = \bar{\tau}$. This steady state is globally stable.*

Proof. Appendix B ■

Here, the steady state has maximal fiscal capacity, public goods provision is at $\hat{g}$, and the residual tax revenue is used to make transfers. The dynamics follow the path in Figure 6.

This equilibrium has features often ascribed to predatory states, where some group is using the state to make transfers. Since the Stability Condition is associated with low θ and low γ, transfers are skewed towards an entrenched incumbent group. If there were a shift in power, the new incumbent would be happy to maintain existing fiscal capacity, as it can expect to continue the redistribution in its own favor.

If α is low, then this long-run equilibrium will also be associated with a lower level of public goods than the common-interest state. In other words, the redistributive steady-state is consistent with a large state, in terms of tax take, along with a low level of common-interest good spending.

As for the comparative statics within this regime, a country with weaker political institutions (lower θ), all else equal, will have a different distribution of expenditure with a higher share going to transfers at the expense of public goods. Naturally, the same shift will apply for a country with a lower demand for public goods (lower α).

5.3 A Weak State

We now consider what happens when neither the Cohesiveness nor the Stability Condition hold. In other words, we look at a state, which combines a lack of checks and balances (low θ) with high political instability (γ much above zero). The following proposition describes the outcome in such a state.

Proposition 4 *If neither the Cohesiveness nor the Stability Conditions holds, then a unique, globally stable steady state exists at* $\tau^W = \hat{\tau}$.

These results are illustrated in Figure 7.

The logic of fiscal under-development is simple. Such a state is insufficiently cohesive to accumulate sufficient fiscal capacity to provide anything near the Lindahl-Samuelson level of the public good. (This would be at the intersection of the dotted line with the 45-degree line in Figure 7.) Also, it never reaches (or remains in) the redistributive regime. Due to the high rate of political turnover, incumbents are sufficiently shortsighted that they do not have sufficient incentives to build (or retain) high levels of fiscal capacity for the purpose of future redistribution. We observe a weak state with low capability of raising revenue.

5.4 Discussion

While too simple to take directly to the data, the three-way classification of states appears to have some relevance to contemporary discussions of state

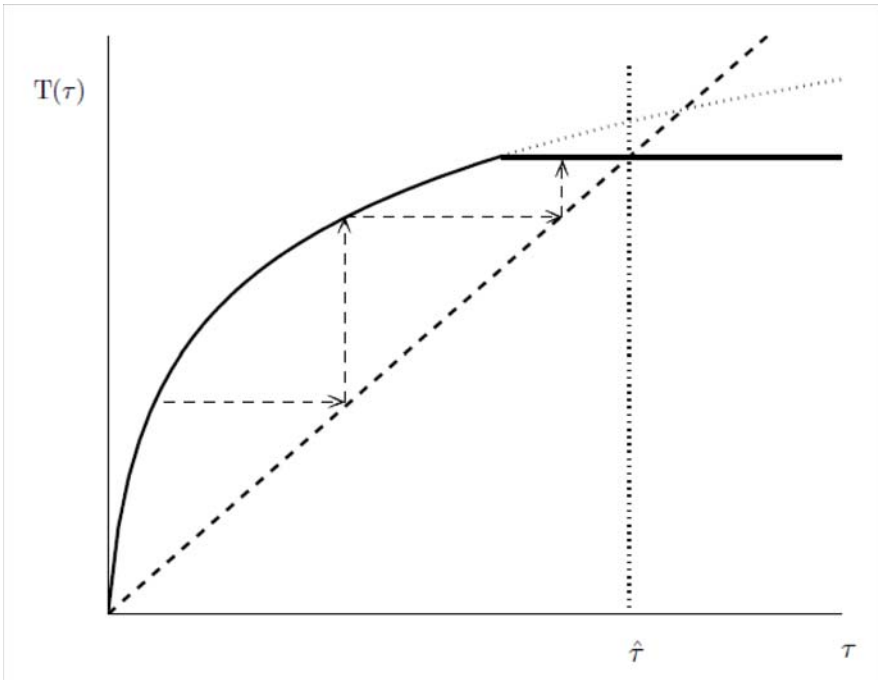

Figure 7: Fiscal capacity in a weak state

building. An interesting finding is that α, the demand for public goods, does not determine which regime the state ends up in, although it does determine the equilibrium size of the common-interest state and the dynamic path towards equilibrium. The claim, as in Herbst (2000), that Africa could break the weak-state trap by fighting wars thus rings hollow in the model. Even though (the risk of) war could indeed raise the level of public spending, this regime would not be sustainable unless accompanied by a rise in θ. In a similar vein, the weak-state trap could explain the observation by Centeno (1997) that Latin America may be an exception to the Tilly hypothesis. In our model, wars lead to sustainable state development only where θ is high enough.

The model suggests an interesting interaction between our two political economy dimensions: cohesiveness and instability (θ and γ). The effect of political instability (γ) is only relevant to the path of fiscal-capacity investment when political institutions permit the exploitation of minorities (θ not close to $\frac{1}{2}$).

Our model also has predictions for what happens when the economy becomes more productive. Within the common-interest regime, this leads to growth in fiscal capacity. But an upward shift up of ω will cut $\omega / (\omega - c\delta)$ and hence decrease the probability that the Cohesiveness Condition is satisfied. The mechanism is that private-sector growth reduces the proportion of resources needed to maintain fiscal capacity in steady state, and this gives room for more public goods driving down their steady-state marginal utility. This suggests that, in a richer model, ongoing growth may eventually drive the economy into a redistributive state, if and when the demand for public goods has been saturated.

Finally, we make a few remarks on welfare. As we have already noted, when the Cohesiveness Condition holds the social optimum (by the Utilitarian criterion) obtains. This outcome is, of course, Pareto efficient. The redistributive state outcome is also Pareto efficient. If there is a failure of political resource allocation, it is distributive with one group tending to benefit more than another from holding office. This is clearest in the limit as γ goes to zero. The welfare economics of weak states is somewhat different, raising the possibility of Pareto inefficient policy choices, what Besley and Coate (1998) call "political failure".[7] Both groups could, in principle, get together and make themselves better off by picking more state capacity

[7] See also the wider discussion of these issues in Acemoglu (2003).

and restricting the use of transfers. However, this would not be incentive compatible in the present model since θ is low – i.e., political institutions are not cohesive enough – meaning that groups cannot commit to abstain from using future holds on power to redistribute in their own favor. This suggests that political reform could be potentially valuable and it would be interesting to investigate the conditions under which such reform could be (credibly) undertaken

6 Conclusions

Development of state capabilities such the ability to raise taxes is an important feature of economic development. This paper puts forward a dynamic approach to studying investments in state capacity. It gives a transparent sense of how two dimensions of political decision making – cohesiveness and stability – impact on dynamic paths of state development. One specific result is the possibility of weak states, where the low capacity to raise revenue reflects a combination of non-cohesive institutions and political instability.

Our analysis suggests possible directions for theoretical development. The model assumes no growth in the private economy (constant ω), nor does it permit technological change in the creation of fiscal capacity (constant c). It would be interesting to allow for either or both. We have also abstracted from other kinds of investments by government to improve private economic outcomes, such as investments in legal capacity. Introducing legal capacity as in Besley and Persson (2009) would obviously add a second state variable.

Similarly, it would be interesting and challenging to introduce public debt in our framework. Credibility of public debt would hinge, in part, on sufficient incentives to invest in future fiscal capacity to support debt repayment given other priorities. If this was credible, a government would be able to use debt finance to accelerate its accumulation of fiscal capacity. Moreover, lack of credibility in debt issue might impose a further burden on weak states.

Ideally, we should also endogenize the exogenous parameters: cohesiveness and stability in the political system (θ and γ). Full-fledged dynamic analyses of political and economic institution building, or of economic institutions and political violence (an important source of instability, as in Besley and Persson (2010)), are interesting but difficult tasks.

A Derivation of Differentiable Symmetrical MPE

First, apply the envelope theorem to (5) to obtain

$$U_\tau^I(\tau) = \alpha V_g(g)[\omega + c(1-\delta)] - \omega. \tag{18}$$

We cannot, however, use the envelope theorem to differentiate $U^O(\tau)$ in (8). Instead, we exploit the assumption that the incumbent's policy rules $\tau' = T(\tau)$ and $G(\tau)$ are differentiable almost everywhere. Then:

$$U_\tau^O(\tau) = \begin{array}{c} \alpha V_g(g)\, G_\tau(\tau) \\ +2\theta[\omega + c(1-\delta) - G_\tau(\tau) - cT_\tau(\tau)] - \omega \\ +\left[\gamma U_\tau(\tau') + (1-\gamma) U_\tau^O(\tau')\right] T_\tau(\tau). \end{array} \tag{19}$$

Now note that whenever (6) holds with equality,

$$G_\tau(\tau) = \omega + (1-\delta)c - cT_\tau(\tau),$$

while when $g = \hat{g}$,

$$G_\tau(\tau) = 0.$$

We can summarize these two equations compactly as

$$G_\tau(\tau) = [\omega + (1-\delta)c - cT_\tau(\tau)]\, J(\tau), \tag{20}$$

where

$$J(\tau) \equiv \begin{cases} 1 & \tau < \hat{\tau} \\ 0 & \tau > \hat{\tau} \end{cases},$$

and $\hat{\tau}$ is defined implicitly by

$$\alpha V_g(\hat{\tau}[\omega + c(1-\delta)] - cT(\hat{\tau})) = 2\omega(1-\theta), \tag{21}$$

giving the tax rate that ensures that government expenditure is at its cutoff point $\hat{g}$, and above which redistributive transfers are positive.

Substituting (20) into (19) yields

$$\begin{array}{c} U_\tau^O(\tau) = \alpha V_g(g)[\omega + (1-\delta)c - cT_\tau(\tau)]\, J(\tau) \\ +2\theta[\omega + c(1-\delta) - cT_\tau(\tau)][1 - J(\tau)] - \omega \\ +\left[\gamma U_\tau(\tau') + (1-\gamma) U_\tau^O(\tau')\right] T_\tau(\tau), \end{array}$$

which in turn yields

$$\begin{aligned} U_\tau^O(\tau) = {} & [\alpha V_g(g) J(\tau) + 2\theta(1 - J(\tau))][\omega + c(1-\delta) - cT_\tau(\tau)] \\ & -\omega + \left[\gamma U_\tau(\tau') + (1-\gamma) U_\tau^O(\tau')\right] T_\tau(\tau). \end{aligned} \tag{22}$$

We now note that

$$\gamma U_\tau^I(\tau') + (1-\gamma) U_\tau^O(\tau') = \frac{1-\gamma}{\gamma} \left[\begin{array}{c} \left(\frac{\gamma^2}{1-\gamma} - (1-\gamma)\right) U_\tau^I(\tau') \\ + (1-\gamma) U_\tau^I(\tau') + \gamma U_\tau^O(\tau') \end{array} \right].$$

Using (10) and (21), this becomes

$$\gamma U_\tau^I(\tau') + (1-\gamma) U_\tau^O(\tau') = \begin{array}{c} \frac{2\gamma-1}{\gamma}[\alpha V_g(g)(\omega + c(1-\delta)) - \omega] \\ + \frac{1-\gamma}{\gamma} c\alpha V_g(g). \end{array}$$

Replacing this back in (22) gives

$$\begin{aligned} U_\tau^O(\tau') = {} & [\alpha V_g(g) J(\tau) + 2\theta(1 - J(\tau))][\omega + c(1-\delta) - cT_\tau(\tau)] - \omega \\ & + \left[\frac{2\gamma-1}{\gamma}[\alpha V_g(g)(\omega + c(1-\delta)) - \omega] + \frac{1-\gamma}{\gamma} c\alpha V_g(g)\right] T_\tau(\tau). \end{aligned}$$

Returning to (10) and using (21) and this last equation, we obtain:

$$c\alpha V_g(g) = \left[\begin{array}{c} \alpha V_g(g') \{[\omega + c(1-\delta)][1 - \gamma + \gamma J(\tau')] + cT_\tau(\tau')[1 - \gamma - \gamma J(\tau')]\} \\ -\omega + 2\gamma\theta(1 - J(\tau'))[\omega + (1-\delta)c - cT_\tau(\tau')] \\ -(1-2\gamma)[\alpha V_g(g'')(\omega + c(1-\delta)) - \omega] T_\tau(\tau') \end{array} \right].$$

More specifically, when the incumbent chooses $\tau' > \hat{\tau}$, then $J(\tau') = 0$ and this equation becomes:

$$\begin{array}{c} c\alpha V_g(g) = 2(1-\theta)(1-\gamma)[\omega + c(1-\delta) + cT_\tau(\tau')] \\ -\omega + 2\gamma\theta[\omega + c(1-\delta) - cT_\tau(\tau')] \\ -(1-2\gamma)[\alpha V_g(g'')(\omega + c(1-\delta)) - \omega] T_\tau(\tau'). \end{array}$$

When $\tau' \leq \hat{\tau}$ then $J(\tau') = 1$ and

$$\begin{array}{c} c\alpha V_g(g) = \alpha V_g(g')[\omega + c(1-\delta)] - \omega \\ -(1-2\gamma)[\alpha V_g(g'')(\omega + c(1-\delta)) - \omega - c\alpha V_g(g')] T_\tau(\tau'). \end{array}$$

These last two equations give (12) and (13), respectively.

B Proofs of propositions

B.1 Proposition 1

The first-order conditions of the Pigovian planner's problem are

$$\alpha V_g(g) = \lambda + 1, \tag{23}$$

where $\lambda \geq 0$ is the Lagrange multiplier on (6) and

$$(\lambda + 1)\, c = U_\tau(\tau') = (\lambda' + 1)\, c\,(1-\delta) + \omega\lambda'.$$

The second equality utilizes the envelope theorem and λ' is the multiplier in the following period. This is a linear difference equation in λ:

$$\lambda' = \frac{c}{c(1-\delta)+\omega}\lambda + \frac{c\delta}{c(1-\delta)+\omega}. \tag{24}$$

This equation has a unique steady state at

$$\lambda^* = \frac{c\delta}{\omega - c\delta}$$

where $\lambda^* > 0$ iff $\omega > c\delta$, which holds by Assumption 1. Moreover, this steady state is stable if

$$\frac{\partial \Delta\lambda}{\partial \lambda}|_{\lambda=\lambda^*} = \frac{c}{c(1-\delta)+\omega} - 1 < 0, \tag{25}$$

where the last inequality holds since $\omega > c\delta$.

When $\lambda > 0$, (6) holds with equality and the economy is in the common-interest regime. Thus the economy has a unique steady state in the common-interest regime with

$$\alpha V_g(g^*) = \lambda^* + 1 = \frac{\omega}{\omega - c\delta},$$

as claimed in the proposition. As (24) is a linear difference equation, condition (25) implies that the economy converges to this steady state for any initial τ such that $\lambda > 0$.

Now consider an economy beginning in the redistributive regime, so that $\lambda_0 = 0$. (24) gives:

$$\lambda_1 = \frac{c\delta}{c(1-\delta)+\omega},$$

so that

$$0 < \lambda_1 < \lambda^*.$$

Then, (23) yields

$$1 < \alpha V_g(g_1) < \alpha V_g(g^*).$$

This implies that the economy jumps immediately to the same level of fiscal capacity as is in the common-interest regime, but above the steady state, and then gradually converges to the steady state. In fact, fiscal capacity jumps exactly to $\hat{\tau}$. This is due to the fact that the Pigovian planner faces a standard dynamic programing problem, with a concave objective function and the budget constraint reflecting a convex set. The policy $T(\tau)$ function is therefore concave, which requires $T(\tau) = \hat{\tau}\ \forall \tau > \hat{\tau}$.

The global stability of the steady state follows from the fact that the $T(\tau)$ function can cross the 45-degree angle only once in the common-interest regime at g^*. The local stability of the steady state implies that in the common-interest regime $T(\tau)$ is above the 45-degree line for $T(\tau) < \tau^*$ and below the 45-degree line for $T(\tau) > \tau^*$. As we have also seen that the economy jumps to the common-interest regime after any period in the redistributive regime, the steady state is globally stable.

B.2 Proof of Proposition 2

We have established the existence of the steady state in the text. To complete the proof, it remains to be shown that this steady state is unique and globally stable under the Cohesiveness Condition.

As a first step, we show that the steady state of Proposition 2 is locally stable. Consider what the incumbent believes about his successor's behavior in the conjectured equilibrium path. Updating (16) we obtain:

$$c\alpha V_g(g') = \alpha V_g(g'')\left[\omega + c(1-\delta)\right] - \omega.$$

Thus the last two lines in (13) are equal to zero. But then the first line of the same equation indicates that the belief that behavior is time-consistent is confirmed in equilibrium. This verifies that the conjectured equilibrium path is indeed an equilibrium.

We now consider the stability of this steady state along this equilibrium path. (13) can be rewritten as:

$$\begin{aligned} & h\left(\tau_s, \tau_{s+1}, \tau_{s+2}\right) \\ = & \begin{array}{c} c\alpha V'\left(\tau_s\left(\omega+(1-\delta)c\right)-c\tau_{s+1}\right) \\ -\alpha V'\left[\tau_{s+1}\left(\omega+(1-\delta)c\right)-c\tau_{s+2}\right]\left(\omega+c\left(1-\delta\right)\right)+\omega \end{array} \\ = & \ 0 \end{aligned}$$

We take a Taylor-series approximation around $\tau_s = \tau_{s+1} = \tau_{s+2} = \tau^C$, to obtain:

$$h \cong h\left(\tau^C\right)+\frac{\partial h\left(\tau^C\right)}{\partial \tau_s}\left[\tau_s-\tau^C\right]+\frac{\partial h\left(\tau^C\right)}{\partial \tau_{s+1}}\left[\tau_{s+1}-\tau^C\right]+\frac{\partial h\left(\tau^C\right)}{\partial \tau_{s+2}}\left[\tau_{s+2}-\tau^C\right].$$

Let $\psi_s \equiv \tau_{s+1}$, then this second-order difference equation can be rewritten as a bivariate first-order difference equation:

$$\left(\begin{array}{c} \tau_{s+1} \\ \psi_{s+1} \end{array}\right)=\left(\begin{array}{cc} 0 & 1 \\ -1 & \frac{c^2+(\omega+c(1-\delta))^2}{c(\omega+c(1-\delta))} \end{array}\right)\left(\begin{array}{c} \tau_s \\ \psi_s \end{array}\right).$$

A simple phase diagram demonstrates that this system is saddle-point stable. Thus the system converges to the common interest steady state beginning at a level of fiscal capacity sufficiently close to the common-interest steady state.

Now consider an incumbent entering a period with $\tau \geq \hat{\tau}$, so that redistributive transfers are provided. We conjecture, and verify, that it is optimal for him to choose $\tau' = T(\tau) = \tilde{\tau}\ \forall \tau > \hat{\tau}$, where $\tilde{\tau}$ is defined by:

$$2(1-\theta)c = \alpha V_g\left(\tilde{\tau}\left(\omega+(1-\delta)c\right)-cT\left(\tilde{\tau}\right)\right)\left[\omega+c\left(1-\delta\right)\right]-\omega, \qquad (26)$$

and where $T(\tilde{\tau})$ is the incumbent's reaction function along the dynamic path defined in $h(\tau_s, \tau_{s+1}, \tau_{s+2}) = 0$ above. Our conjecture implies that the incumbent's successor will also choose $T(\tau') = \tilde{\tau}\ \forall \tau > \hat{\tau}$. Then $T_\tau(\tau') = 0$ for all $\tau' > \hat{\tau}$. If the incumbent were to to choose $\tau' > \hat{\tau}$, then the relevant first-order condition is (12), rewritten here as:

$$2(1-\theta)c = 2\left[(1-\theta)(1-\gamma)+\gamma\theta\right]\left[\omega+c\left(1-\delta\right)\right]-\omega.$$

But as the Stability Condition does not hold, this equality cannot hold. In fact, the left-hand side (the marginal value of consuming a unit of fiscal capacity) is always larger than the right-hand side (the marginal value of accumulating a unit of fiscal capacity). Thus the incumbent would like to decumulate fiscal capacity until $\tau' \leq \hat{\tau}$. But then the incumbent chooses τ' based on (13), which now can be rewritten as:

$$2(1-\theta)c = \alpha V_g(g')[\omega + c(1-\delta)] - \omega.$$

Replacing the successor's budget constraint $g' = \tau'(\omega + (1-\delta)c) + T(\tau')$ exactly gives (26).

Next we show that no incumbent in the common-interest regime will ever choose $\tau \geq \hat{\tau}$. Given that (1) $T_\tau(\tau') = 0\ \forall \tau' > \hat{\tau}$, (2) $\alpha V_g(G) \geq 2(1-\theta)$ and (3) does not hold, the first-order condition (12) can never hold and it cannot be optimal to choose $\tau > \hat{\tau}$.

We now show that the steady state is unique. We have seen that $\tau' \leq \hat{\tau}$ for all $\tau > \hat{\tau}$ there can be no additional steady state in the redistributive regime. In the common-interest regime, we have assumed that $T_\tau(\tau) \neq \frac{1}{1-2\gamma}$. However, in principle, (14) can also be satisfied if if $T_\tau(\tau) = \frac{1}{1-2\gamma}$ holds. There may be a steady state in the common-interest regime where $T_\tau(\tau) = \frac{1}{1-2\gamma}$, in addition to the one established in Proposition 2. To understand the implications of such a steady state, notice that $\frac{1}{1-2\gamma} \in \{(-\infty, -1), (1, \infty)\}$, because $\gamma \in (0, 1)$. This candidate steady state must therefore occur when $T(\tau)$ crosses the 45-degree line from above (below) at a slope exceeding 1 in absolute value, if $\gamma > \frac{1}{2}$ ($\gamma < \frac{1}{2}$).

If $\gamma > \frac{1}{2}$, no such steady state can exist. Otherwise, $T(\tau)$ would have to twice cross the 45-degree line from above without ever crossing it from below. This contradicts the assumption of the differentiability of $T(\tau)$.

If on the other hand $\gamma < \frac{1}{2}$, there are two possibilities. First, the candidate steady state could be at a level of τ below the steady state of Proposition 2. But this implies that for any τ lower than τ^{SS} defined by $T_\tau(\tau^{SS}) = \frac{1}{1-2\gamma}$, the economy converges to $\tau = 0$. As the marginal utility of public good provision is infinite when $\tau = 0$, this must violate the intertemporal optimality for some τ. Second, the candidate steady state could be to the right of the steady state of Proposition 2. But this implies that $T(\tau) > \hat{\tau}$ for some $\tau < \hat{\tau}$. But we have shown above that $T(\tau) > \hat{\tau}$ for $\tau \leq \hat{\tau}$ violates the assumptions of the proposition. Thus no other steady state exists.

We have demonstrated that τ^C is a locally stable steady state and therefore $T(\tau)$ crosses the 45-degree angle from above in the common-interest regime. In the redistributive regime, incumbents decumulate fiscal capacity to enter the common-interest regime in the following period. τ^C is therefore globally stable.

B.3 Proof of Proposition 3

We begin by noting that when $\tau > \hat{\tau}$, then $c\alpha V_g(g) = 2(1-\theta)c$ and neither (12) nor (13) contain τ. Thus the current level of fiscal capacity is immaterial for the choice of next period's fiscal capacity. This gives $T_\tau(\tau) = 0\ \forall \tau \geq \hat{\tau}$. Then, (17) becomes:

$$2(1-\theta)\left[c - (1-\gamma)(\omega + c(1-\delta))\right] - 2\gamma\theta(\omega + c(1-\delta)) + \omega \leq 0,$$

holding with strict inequality only if $\tau' = \bar{\tau}$. But this is equivalent to the Stability Condition which holds by assumption. Thus $T(\tau) = \bar{\tau}\ \forall \tau > \hat{\tau}$ and $\bar{\tau}$ is the unique steady state in the redistributive regime.

Now, consider the common-interest regime. We have seen that the common-interest steady state τ^C does not exist if the Cohesiveness Condition is violated. As the Cohesiveness and Stability Conditions are mutually exclusive, τ^C is not a candidate steady state.

However, as discussed in the proof of Proposition 2, an additional common-interest steady state with $T_\tau(\tau^{SS}) = \frac{1}{1-2\gamma}$ may exist. As in that proof, $\gamma < \frac{1}{2}$ would imply that τ converges to zero for any $\tau < \tau^{SS}$, which must violate (13) for some level of τ.

If $\gamma > \frac{1}{2}$, $T_\tau(\tau^{SS}) = \frac{1}{1-2\gamma}$ implies that $T(\tau)$ crosses the 45-degree line from above at this candidate steady state, with a slope below -1. Second, note that $\lim_{\tau \to 0} T(\tau) = 0$. This follows directly from (6). As shown in Figure 8 below, these two facts, together with the continuity of $T(\tau)$, imply that there is some $\tilde{\tau} < \tau$ where $T(\tilde{\tau}) = \tau^{SS}$. Then at $\tau = \tilde{\tau}$, (13) becomes

$$\frac{\begin{bmatrix} \alpha V_g\left((\omega - c\delta)\tau^{ss}\right)\left[\omega + c(1-\delta)\right] \\ -\omega - c\alpha V_g\left((\omega + (1-\delta)c)\tilde{\tau} - c\tau^{SS}\right) \end{bmatrix}}{\begin{bmatrix} \alpha V_g\left((\omega - c\delta)\tau^{ss}\right)(\omega + c(1-\delta)) \\ -\omega - c\alpha V_g\left((\omega - c\delta)\tau^{ss}\right) \end{bmatrix}} = (1-2\gamma)\, T_\tau\left(\tau^{SS}\right).$$

But, since $T_\tau(\tau^{SS}) = \frac{1}{1-2\gamma}$, this equation can only hold if $\tilde{\tau} = \tau^{SS}$, which contradicts the definition of $\tilde{\tau}$. Thus this second steady state does not exist.

As no steady state exists in the common-interest regime, the continuity of $T(\tau)$ requires that $T(\tau) > \tau\ \forall \tau < \hat{\tau}$ or $T(\tau) < \tau\ \forall \tau < \hat{\tau}$. But the latter again assumes a path of τ that converges to zero, thus violating (13). With $T(\tau) > \tau\ \forall \tau < \hat{\tau}$ and $T(\tau) = \bar{\tau}\ \forall \tau > \hat{\tau}$, the steady state of Proposition 3 is globally stable.

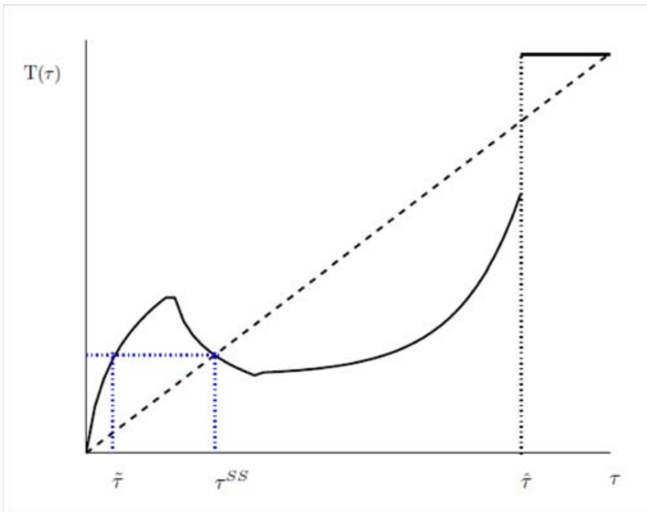

Figure 8: Counterfactual common-interest steady state in redistributive state

B.4 Proposition 4

We first show that $T(\tau) \leq \hat{\tau}\ \forall \tau > \hat{\tau}$. In words, if rents are available to the incumbent, she will always choose to scrap fiscal capacity in favour of rents and leave her successor in the common-interest regime.

To verify that this is true, notice that τ does not appear in (12) when $\tau = \hat{\tau}$ (giving $\alpha c V_g(g) = 2(1-\theta)c$). Thus the choice $T(\tau)$ is unaffected by the value of τ when $\tau > \hat{\tau}$ and a choice $\tau' > \hat{\tau}$ would imply remaining at a constant level of τ henceforth. Then (17) holds and $T_\tau(\tau') = 0$. But then

$$2(1-\theta)[c-(1-\gamma)(\omega + c(1-\delta))] - 2\gamma\theta(\omega + c(1-\delta)) + \omega \leq 0,$$

which exactly gives the the Stability Condition, which is assumed not to hold. Thus $T(\tau) = \tilde{\tau} \leq \hat{\tau}\ \forall \tau > \hat{\tau}$.

Second, it can never be optimal for an incumbent in the common-interest regime to choose $\tau' > \hat{\tau}$. Assume, counterfactually, that the incumbent chose to do so. Given that $T_\tau(\tau') = 0\ \forall \tau' > \hat{\tau}$, (12) would state

$$c\alpha V_g(g) = 2[(1-\theta)(1-\gamma) + \gamma\theta][\omega + c(1-\delta)] - \omega,$$

However, the fact that the Stability Condition does not hold implies

$$c\alpha V_g(g) > 2(1-\theta)c > 2[(1-\theta)(1-\gamma) + \gamma\theta][\omega + c(1-\delta)] - \omega,$$

with the first inequality reflecting that the incumbent is in the common interest regime. Thus $T(\tau) \leq \hat{\tau}\ \forall \tau \leq \hat{\tau}$. As $T(\tau)$ is above the 45-degree line in the common interest regime, for reasons put forth in the proof of Proposition 3, it must be that $\hat{\tau}$ is a steady state. Moreover, another steady state in the common-interest regime is impossible for the reasons discussed in the same proof and we have seen above that no steady state exists in the redistributive regime. $\hat{\tau}$ is therefore the unique steady state. This steady state is stable, as τ converges to $\hat{\tau}$ for any starting point $\tau \leq \hat{\tau}$. We have seen that when $\tau > \hat{\tau}$, $T(\tau) \leq \hat{\tau}$, so that the steady state is reached when starting from any $\tau > \hat{\tau}$ as well.

We now explore the topology of $T(\tau)$. We first show that $T(\tau)$ is flat as we approach $\hat{\tau}$ from the left. Consider the choice $T(\hat{\tau} - \varepsilon) \in (\hat{\tau} - \varepsilon, \hat{\tau}]$. At this point g, g' and g'' are arbitrarily close to each other and $\alpha v_g(g)$ is arbitrarily close to $2(1-\theta)$. Then (13) can be rewritten as

$$\tilde{\varepsilon} = [1 - (1-2\gamma) T_\tau(\tau')] [2(1-\theta)(\omega + c(1-\delta)) - \omega - 2(1-\theta)c] \quad (27)$$

where $\tilde{\varepsilon} \gtreqless 0$ can be made arbitrarily close to zero, through the choice of ε ($\lim_{\varepsilon \to 0} \tilde{\varepsilon} = 0$). However, the violation of the Cohesiveness Condition implies

$$2(1-\theta)(\omega - c\delta) - \omega > 0.$$

So unless $(1-2\gamma) T_\tau(\tau') = 1$, (27) and therefore (13) must be violated for some ε close to zero. But as $T(\tau)$ is above the 45-degree line and $T(\tau) \leq \hat{\tau}$ in the common interest regime then $\lim_{\varepsilon \to 0} T(\hat{\tau} - \varepsilon) \in [0, 1)$. As $(1-2\gamma) \in [-1, 1]$, we must have $T_\tau(\hat{\tau} - \varepsilon) = 0$, for $(1-2\gamma) T_\tau(\tau') = 1$ to hold. This demonstrates that $T(\tau)$ is flat as τ approaches $\hat{\tau}$ from the left.

Next, we conjecture and verify that $T(\tau) = \hat{\tau}\ \forall \tau > \hat{\tau}$. Rewriting (13) with $g' = g'' = \hat{g}$, and taking into account that $T_\tau(\hat{\tau}) = 0$ (we have seen that this is true of the derivative from the left, but we conjecture that it is true of the derivative from the right as well), gives

$$2(1-\theta)c = 2(1-\theta)[\omega + c(1-\delta)] - \omega.$$

The right hand side of this equation always exceeds its left hand side, as the Cohesiveness Condition does not hold. But then the marginal value of higher state capacity always exceeds its cost, when an incumbent in the redistributive regime chooses to transition to the common interest regime. As the incumbent would like to accumulate a higher state capacity than any point in the common interest regime, and lower than any point in the redistributive regime, it must be the case that $T(\tau) = \hat{\tau}\ \forall \tau > \hat{\tau}$.

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