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Separation of powers and political budget cycles

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Abstract Political budget cycles (PBCs) arise when the electorate is imperfectly informed about the incumbent's competence and the incumbent has discretion over the budget. Focusing on the second condition, we study how separation of powers affects PBCs in the composition of government spending. We find that the details of the budget process, namely, the bargaining rules, the status quo's location, and the degree of compliance with the budget law, are critical for the existence and the amplitudes of PBCs. In particular, when the status quo is determined by the previous budget and there is high compliance with the budget law, separation of powers acts as a commitment device which solves the credibility problems that drive PBCs.

Keywords Political budget cycles · Concentration of powers · Separation of powers · Budget process · Checks and balances · Time consistency

JEL Classification D72 · D78 · H60

1 Introduction

Building on earlier research about the opportunistic manipulation of the economy around elections, the literature on political budget cycles (PBCs) studies cycles in fiscal policies generated by the electoral process. These cycles may be in the composition of public spending, in the size of the total budget, and in the choice of taxes or debt to finance the budget.

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This literature has made significant progress analyzing the role of informational issues in the generation of PBCs.[1] However, it assumes that fiscal decisions are unilaterally taken by the executive, without any institutional constraint. This assumption of concentration of powers in the hands of the executive is not innocuous. As Lohmann (1998b), Shi and Svensson (2006) and Alt and Lassen (2006b) show, the credibility problem created by this type of institutional arrangement is at the heart of electoral cycles in monetary and fiscal policy.

To what extent can institutional constraints moderate the credibility problem that leads to PBCs? We address this issue by analyzing the impact of separation of powers on electoral cycles in the composition of government spending. To do that, we use a (moral hazard) model where neither politicians nor voters observe the current competence shock before making their choices, but the government enjoys a temporary information advantage over the budget allocation chosen.

As in Rogoff (1990), under asymmetric information the political incumbent faces an incentive to boost the supply of more visible public goods before elections, in the hope that voters will attribute the boost to its competence and reelect it for another term.[2] But unlike the standard models of PBCs, instead of an all-powerful executive, we introduce the legislature into the policymaking process.[3]

Separation of powers brings into play a system of checks and balances. In this regard, in all constitutional democracies a relatively fixed procedure, known as the budget process, is followed every year to draft, approve and implement the annual budget of expenditures and the public resources to finance it.[4] This procedure is modeled as a bargaining game between the executive and the legislature, which resembles the agenda-setter model of Romer and Rosenthal (1978, 1979).[5]

Conceptually, by requiring the joint agreement of the executive and legislative branches in the budget process, the role of separation of powers is to provide the executive a way to credibly commit not to manipulate fiscal policy in electoral years. We find that the details of the budget process, namely, the bargaining rules, the status quo's location, and the degree of compliance with the budget law, are critical for the existence and the amplitudes of PBCs.

[1]For instance, Shi and Svensson (2006) empirically show that in countries with less informed voters, measured by the product of radios per capita and freedom of broadcasting, PBCs are stronger. On the other hand, Brender and Drazen (2005) study how voters' experience with electoral politics mitigates PBCs. Finally, Alt and Lassen (2006a, 2006b) find that, within OECD countries, PBCs emerge only when fiscal transparency is low.

[2]Given our timing à la Lohmann (1998b), where policy choices are made before the competence shock is observed, this electoral bias is similar to the inflation bias in Barro and Gordon (1983). The Barro-Gordon model assumes that commitment is achieved if policy is decided before expectations. In our model this is not enough to achieve commitment because of asymmetric information on the actual budget allocation: a high provision of visible public goods may be due either to high competence, or to an electoral manipulation of the budget allocation.

[3]For monetary policy, the role of several policymakers in electoral cycles has been analyzed by Lohmann (1998a). In Streb (2005), institutional features are crucial for PBCs to arise, because the executive needs discretion to manipulate budget items without being hampered by congress. However, the interaction between the executive and legislative branches is not formally modeled. Our approach can also be related to the institutional solutions suggested by the literature on time consistency to address the inflation bias predicted in Barro and Gordon (1983).

[4]Alesina and Perotti (1995) review the literature on budget processes and institutions. Alesina et al. (1999) point out that budget institutions do indeed have a significant role in explaining the cross-country variance of fiscal experiences in Latin America. However, this literature does not relate budget institutions to PBCs.

[5]Persson et al. (1997) use a similar framework to analyze separation of powers as a mechanism to control the rents politicians appropriate from holding office.

In particular, when the status quo is determined by the previous budget and there is high compliance with the budget law, separation of powers acts as a commitment device which solves the credibility problems that drive PBCs.

The rest of the paper is organized as follows. Section 2 presents the model. The equilibrium analysis is carried out in Sects. 3 and 4. Section 5 summarizes the main results and outlines directions for future research.

2 The model

Consider an infinite horizon society with a continuum $[0, 1]$ of identical voters. In every period t, the representative voter derives utility from two public goods, a visible (consumption) good $g_t \in \Re_+$, instantaneously produced and supplied, and a less visible (capital) good $k_{t+1} \in \Re_+$, available at the end of period t. To simplify the analysis, we assume the representative voter's utility function to be given by $u(g_t, k_{t+1}) = g_t^{\alpha} k_{t+1}^{1-\alpha}$, with $\alpha \in (0, 1)$.

Public goods are provided by the government through the executive branch. In each period, the executive is subject to the budget constraint $\gamma_t + \kappa_t = \tau$, where $\gamma_t, \kappa_t \in \Re_+$ denote actual budget expenditures on consumption and capital goods, respectively, and $\tau \in \Re_{++}$ is a fixed sum of tax revenues. The effective provision of public goods is affected by budget expenditures and a random variable θ_t, which represents the competence of the executive incumbent. Specifically, we assume that $g_t = \theta_t \gamma_t$ and $k_{t+1} = \theta_t \kappa_t$.

As in Rogoff and Sibert (1988), competence follows a first order moving average process, reflecting the fact that competence is partially lasting. Formally, $\theta_t = \bar{\theta} + \varepsilon_t + \varepsilon_{t-1}$, where ε_t and ε_{t-1} are two independent and identically distributed competence shocks, uniformly distributed over the interval $[-1/2\xi, 1/2\xi]$, with density $\xi > 0$. The probability distribution of θ_t conditional on ε_{t-1}, $F(\theta_t \mid \varepsilon_{t-1})$, also is uniform with support $[\bar{\theta} + \varepsilon_{t-1} - 1/2\xi, \bar{\theta} + \varepsilon_{t-1} + 1/2\xi]$. In the sequel, we assume $\bar{\theta} > 1/\xi$, so that θ_t is always positive.

In contrast with much of the theoretical work on political budget cycles, the process for setting the composition of public expenditures, referred to as the *budget process*, involves the interaction of two political agents, denoted by E and L. These agents are the current leaders, or incumbents, of the two branches of government, the executive and the legislature. In each branch, a leader's term lasts two periods. Incumbents seek reelection to enjoy office rents $\chi > 0$, which are received at the beginning of each term in office. Like other citizens, they also derive utility from public goods.

In each period t, the executive proposes to the legislature a level of public expenditures $\tilde{\gamma}_t^E \in [0, \tau]$ for the provision of the consumption good g_t before the competence shock ε_t is realized. If there are no amendment rights, the legislature observes $\tilde{\gamma}_t^E$ and decides whether to accept the proposal or to reject it. The approved expenditures, denoted by $\tilde{\gamma}_t$, are either $\tilde{\gamma}_t^E$ or the status quo $\bar{\gamma} \in [0, \tau]$, which is exogenously given. The approved expenditures for the provision of the capital good k_{t+1} are residually determined by $\tilde{\kappa}_t = \tau - \tilde{\gamma}_t$.

Alternatively, if the legislature is allowed to amend the executive's proposal, the amended proposal $\tilde{\gamma}_t^L \in [0, \tau]$ needs to be approved by the executive. In this case, $\tilde{\gamma}_t$ equals: $\tilde{\gamma}_t^E$ if the legislature does not change the executive proposal, $\tilde{\gamma}_t^L$ if L amends $\tilde{\gamma}_t^E$ and E approves the amendment, and the status quo $\bar{\gamma}$ otherwise. Again, $\tilde{\kappa}_t = \tau - \tilde{\gamma}_t$.

Once budget expenditures have been approved, the executive has discretion to reassign a proportion $1 - \delta \in [0, 1]$ of the resources $\tilde{\kappa}_t$ allocated to the provision of the capital good, which it can apply to the supply of the consumption good. This determines actual expenditures $\gamma_t \in [\tilde{\gamma}_t, \tilde{\gamma}_t + (1 - \delta)(\tau - \tilde{\gamma}_t)]$ on the consumption good. We will interpret δ as the degree of compliance with the budget law.

Next, the competence shock ε_t is realized and g_t and k_{t+1} are determined. The representative voter observes g_t. If t is an election period, then a new leader for the legislature is randomly selected from the set of voters [0, 1], so the probability of reappointment is zero. At the same time, the executive leader is elected in an explicit contest. If the incumbent is confirmed, it controls the executive office for another term. Otherwise, a new policymaker is randomly chosen from [0, 1]. Finally, agents observe ε_t and k_{t+1}.

3 One policymaker

Following the existent literature, first we assume that there is only one policymaker I in office. This case would take place if, for example, the result of the legislative electoral process is perfectly correlated with the outcome of the executive election.

Let $\beta \in (0, 1)$ denote the common discount factor and $v(\gamma_t, \theta_t) \equiv u[\theta_t\gamma_t,\ \theta_t(\tau - \gamma_t)]$ the indirect utility of period t. If there are no elections and a unique individual is randomly selected to control both the executive and the legislature, then equilibrium expenditures are given by $\gamma^* = \alpha\ \tau$ and $\kappa^* = (1-\alpha)\ \tau$. This is the social planner's solution. Though there are no cycles, neither can an incompetent incumbent be removed from office.

With a single policymaker and elections every other period, the model replicates the standard results in the literature. Let t be the electoral period and $t+1$ the post-electoral period. First, post-electoral period $t+1$ is uncorrelated with any future election. Consider, for example, voters' expected utility in post-electoral period $t+3$, which determines the vote at $t+2$. Since competence follows a MA(1) process, expected utility in $t+3$ is not affected by E's competence in $t+1$. Therefore, period $t+1$ is independent of the continuation game; and E has no incentives to manipulate actual expenditures g_{t+1}. That means, $\gamma_{t+1}^c = \gamma^*$, where the superscript c stands for concentration of powers.

In electoral period t, observed expenditure g_t allows voters to compute $E_t[v(\gamma_{t+1}, \theta_{t+1}) \mid g_t]$ for the incumbent, whereas they can only compute unconditional expectation $E[v(\gamma_{t+1}, \theta_{t+1})]$ for the challenger. Maximization of expected utility implies that the incumbent is preferred if and only if its expected competence is greater than or equal to the unconditional expectation of competence:

$$E_t[\theta_{t+1} \mid g_t] \geq \bar{\theta}. \tag{1}$$

Since $\theta_{t+1} = \bar{\theta} + \varepsilon_{t+1} + (\theta_t - \bar{\theta} - \varepsilon_{t-1}) = \varepsilon_{t+1} + \theta_t - \varepsilon_{t-1}$, it follows that voters' beliefs are $E_t[\theta_{t+1} \mid g_t] = E_t[\theta_t \mid g_t] - \varepsilon_{t-1}$. Hence, $E_t[\theta_{t+1} \mid g_t] \geq \bar{\theta}$ if and only if $E_t[\theta_t \mid g_t] \geq \bar{\theta} + \varepsilon_{t-1}$.

Since the incumbent does not observe its competence before choosing the expenditure composition, expected expenditure γ_t^e cannot depend on θ_t. Thus, using the fact that $g_t = \theta_t\gamma_t$, we have

$$\theta_t^e \equiv E_t[\theta_t \mid g_t] = \frac{g_t}{\gamma_t^e}. \tag{2}$$

Hence, $\theta_t^e \geq \bar{\theta} + \varepsilon_{t-1}$ if and only if

$$\theta_t \geq \frac{(\bar{\theta} + \varepsilon_{t-1})\gamma_t^e}{\gamma_t}. \tag{3}$$

From the incumbent's perspective, the probability of being reelected becomes

$$\mu_{t+1}^E(\gamma_t) = 1 - F\left(\frac{(\bar{\theta} + \varepsilon_{t-1})\gamma_t^e}{\gamma_t} \mid \varepsilon_{t-1}\right). \tag{4}$$

Thus, abstracting from other constant terms, E's maximization problem is

$$\max_{\gamma_t} E_t \left\{ \theta_t (\gamma_t)^{\alpha} (\tau - \gamma_t)^{1-\alpha} + \beta \, \mu_{t+1}^E \, \chi \mid \varepsilon_{t-1} \right\}, \tag{5}$$

subject to (4). The first derivative with respect to γ_t is

$$\left(\frac{\gamma_t}{\tau - \gamma_t} \right)^{\alpha} \left[1 - \alpha \left(\frac{\tau - \gamma_t}{\gamma_t} + 1 \right) \right] = \frac{\beta \chi F' \gamma_t^e}{(\gamma_t)^2}. \tag{6}$$

In equilibrium, $\gamma_t = \gamma_t^e$, since actual and expected decisions coincide. Denote equilibrium γ_t by γ_t^c. Therefore, (6) can be re-written as

$$\left(\frac{\gamma_t^c}{\tau - \gamma_t^c} \right)^{\alpha} (\gamma_t^c - \alpha \tau) = \beta \chi F'. \tag{7}$$

The right-hand side of (7) is positive. Thus, $(\gamma_t^c - \alpha\tau) > 0$, which means that $\gamma_t^c > \alpha\tau = \gamma_t^*$ and $\kappa_t^c < (1-\alpha)\tau = \kappa_t^*$. Since (4) and (5) are both concave, γ_t^c is unique.[6] Furthermore, since the first-order condition in (7) is the same for all electoral periods, $\gamma_t^c = \gamma^c$. Finally, in equilibrium,

$$\mu_{t+1}^E = 1 - F\left(\bar{\theta} + \varepsilon_{t-1} \mid \varepsilon_{t-1} \right) = \frac{1}{2}. \tag{8}$$

Summarizing, the perfect Bayesian Nash equilibrium of the game is as follows.

Proposition 1 *Assume there is concentration of powers. Then, there exists a unique pure strategy equilibrium with the property that* $\gamma_{t+1}^c = \gamma^*$, $\gamma_t^c = \gamma^c > \gamma^*$, $\gamma_t^e = \gamma^c$, *and voters reelect the incumbent if and only if* $g_t/\gamma_t^e \geq \bar{\theta} + \varepsilon_{t-1}$.

Let $\Delta = |\gamma_{t+1} - \gamma_t|$ denote the size of the electoral cycle in budget expenditures.

Corollary 1 *There is an electoral cycle* $\Delta^c > 0$, *which is increasing in* χ *and* β.

The first part of Corollary 1 is immediate from Proposition 1. With respect to the statement that Δ^c is increasing in χ, note first that $\partial \Delta^c / \partial \chi = \partial \gamma_t^c / \partial \chi$. Therefore, totally differentiating (7) with respect to χ, we have

$$\frac{\partial \gamma_t^c}{\partial \chi} = \frac{\beta F'}{(\frac{\gamma_t^c}{\tau - \gamma_t^c})^{\alpha} [\frac{\alpha\tau(\gamma_t^c - \alpha\tau)}{\gamma_t^c(\tau - \gamma_t^c)} + 1]},$$

which is strictly greater than zero. Similarly,

$$\frac{\partial \gamma_t^c}{\partial \beta} = \frac{\chi F'}{(\frac{\gamma_t^c}{\tau - \gamma_t^c})^{\alpha} [\frac{\alpha\tau(\gamma_t^c - \alpha\tau)}{\gamma_t^c(\tau - \gamma_t^c)} + 1]},$$

which is also positive. This completes the proof.

[6] We analyze pure strategies because voters are only willing to adopt mixed strategies in the non-generic case where the expected competence of the incumbent and the challenger are the same. On the other hand, the incumbent will not play mixed strategies because voters reelect the incumbent with certainty beyond a certain threshold of g_t, so the probability of reelection is increasing in γ_t.

Thus, under one policymaker (concentration of powers), our model predicts optimal policy during off-electoral periods, and public consumption expenditures above the optimal level during electoral periods. The intuition for post-electoral periods is clear, because there is no incentive to distort fiscal policy when reputation of competence lasts only one period. But, why can't the optimal allocation be sustained in an electoral period? The incumbent cannot credibly commit to follow γ^* because, if such policy were expected by voters, the incumbent would have an incentive to exploit its discretionary power and deviate to γ^c, which increases its probability of being reelected. Hence, this cannot be part of an equilibrium.

4 Two policymakers

Now, we incorporate a second policymaker, the legislature, into the model. Two variants are considered, depending on whether the executive is the agenda-setter, i.e., legislative amendments to the proposals of the executive are not permitted, or it is the veto player, meaning that amendments are indeed allowed. In both cases, the status quo is assumed to be exogenously given.

Giving that what matters for PBCs are not nominal checks and balances, but rather effective checks and balances, first we analyze these two scenarios in the limiting case where the approved budget law is the policy implemented by the executive (i.e., when $\delta = 1$). And then, to reflect the possibility of imperfect legislative oversight and enforcement, we study the general case of imperfect compliance, where $\delta \in [0, 1]$. Finally, we examine what happens when the status quo is endogenously determined by the previous period's budget.

4.1 Closed rule

Assume that the executive's proposal cannot be amended by the legislature, a situation usually known as closed rule. In this case, the legislature faces a take-it-or-leave-it allocation proposal, with rejection followed by the exogenous reversion point $(\bar{\gamma}, \bar{\kappa})$.

Following the argument in Proposition 1, in the post-electoral period $t+1$ the incumbents implement their common most-preferred policy γ^*. No agent can be made better off by unilateral deviations.

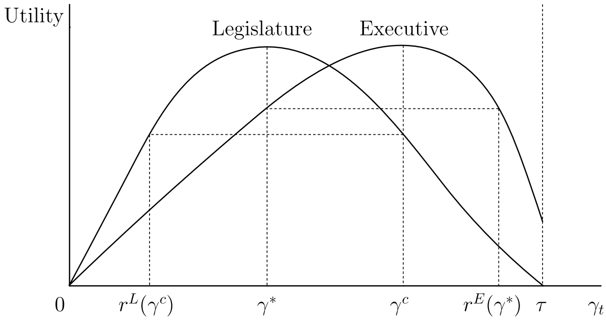
Going back to the electoral period t, consider first incumbents' policy preferences over γ_t in electoral periods. For $j \in \{E, L\}$, player j's payoff $\tilde{\pi}^j(\gamma_t)$ is given by

$$\tilde{\pi}^j(\gamma_t) = E_t \left\{ v(\gamma_t, \theta_t) + \beta \left[v(\gamma^*, \theta_{t+1}) + \mu^j_{t+1}\, \chi \right] \mid \varepsilon_{t-1} \right\}. \tag{9}$$

It is easy to see that preferences $\tilde{\pi}^j$ are single-peaked on $[0, \tau]$, because $E[v(\gamma_t, \theta_t) \mid \varepsilon_{t-1}]$ and $\mu^E_{t+1}(\gamma_t)$ are both strictly concave (see Fig. 1). On the other hand, the ideal policy γ^j of incumbent j is the maximizer of $\tilde{\pi}^j$. Conceptually, it represents the policy the incumbent would choose in an electoral period if it were not constrained by the requirement that its proposal has to be approved by the other policymaker. In our case, $\gamma^L = \gamma^*$ and $\gamma^E = \gamma^c$, because L cannot affect its probability of reelection, but E takes into account the tradeoff between the probability of reelection and the welfare implications of electoral distortions in the budget composition.

The problem for the voter is to estimate the competence of E after having observed g_t. As in the previous section, for the expected equilibrium policy γ^e_t, $\theta^e_t = g_t/\gamma^e_t$. Thus, μ^E_{t+1}

Fig. 1 Incumbents' preferences over γ_t



has the same form as in (4). However, γ_t is now determined in a bargaining process between the executive and the legislature, instead of being unilaterally set by E.

We first solve the process under perfect compliance with the budget law ($\delta = 1$), where actual expenditure γ_t^s equals the approved budget proposal $\tilde{\gamma}_t^s$, and superscript s stands for equilibrium values under separation of powers. Under the closed rule, E has maximum power in the bargaining game. In order to pass a proposal $\tilde{\gamma}_t^E$, E has to guarantee L at least its reservation payoff $\tilde{\pi}^L(\bar{\gamma})$, to persuade it not to reject $\tilde{\gamma}_t^E$. That is, the executive's proposal has to satisfy the incentive constraint

$$\tilde{\pi}^L(\tilde{\gamma}_t^E) \geq \tilde{\pi}^L(\bar{\gamma}). \tag{10}$$

Therefore, the problem of E at date t is to choose an expenditure proposal to maximize (9) subject to (10) and (4).

Define the mirror function $r^j(\gamma)$ as follows: $\forall\, \gamma' \in [0, \gamma^j]$, set $r^j(\gamma') = \gamma''$ if there exists $\gamma'' \in [\gamma^j, \tau]$ such that $\tilde{\pi}^j(\gamma') = \tilde{\pi}^j(\gamma'')$, and $r^j(\gamma') = \tau$ otherwise. Similarly, $\forall\, \gamma' \in [\gamma^j, \tau]$, set $r^j(\gamma') = \gamma''$ if there exists $\gamma'' \in [0, \gamma^j]$ such that $\tilde{\pi}^j(\gamma') = \tilde{\pi}^j(\gamma'')$, and $r^j(\gamma') = 0$ otherwise.

Looking at Fig. 1, it is clear that only two cases are possible. If $\bar{\gamma} \in [0, r^L(\gamma^c)] \cup [\gamma^c, \tau]$, then (10) is not binding, since $\tilde{\pi}^L(\gamma^c) > \tilde{\pi}^L(\bar{\gamma})$ for all $\bar{\gamma} \neq \gamma^c$. That is, the reversion outcome is too low or too high for L to be willing to affect the equilibrium budget policy $\tilde{\gamma}_t^s$. Voters anticipate this and expect that E will obtain in equilibrium authorized expenditures $\tilde{\gamma}_t^s = \gamma^c$. Therefore, the same reasoning of Sect. 3 applies.

On the other hand, if $\bar{\gamma} \in (r^L(\gamma^c), \gamma^c)$, then $\tilde{\gamma}_t^s$ will be above γ^*, but below γ^c (except, of course, in the case where $\bar{\gamma} = \gamma^*$). Concretely, since L would reject any other proposal that violates (10), E ties L to its status quo payoff by proposing $\tilde{\gamma}_t^E = \max\{\bar{\gamma}, r^L(\bar{\gamma})\}$. It will never offer more than that, since this proposal makes L indifferent between either accepting or rejecting it and getting the default payoff.

In both cases, a Nash equilibrium implies that the optimal solution of E coincides with voters' expected equilibrium policy (i.e., expectations are rational).

Proposition 2 *Assume there is separation of powers and closed rule. With perfect compliance, there exists a unique pure strategy equilibrium such that* $\gamma_{t+1}^s = \tilde{\gamma}_{t+1}^E = \gamma^*$,

$$\gamma_t^s = \tilde{\gamma}_t^E = \begin{cases} r^L(\bar{\gamma}) & \textit{if } \bar{\gamma} \in (r^L(\gamma^c), \gamma^*), \\ \bar{\gamma} & \textit{if } \bar{\gamma} \in [\gamma^*, \gamma^c), \\ \gamma^c & \textit{otherwise}, \end{cases} \tag{11}$$

$\gamma_t^e = \gamma_t^s$, *and voters reelect the incumbent if and only if* $g_t/\gamma_t^e \geq \bar{\theta} + \varepsilon_{t-1}$.

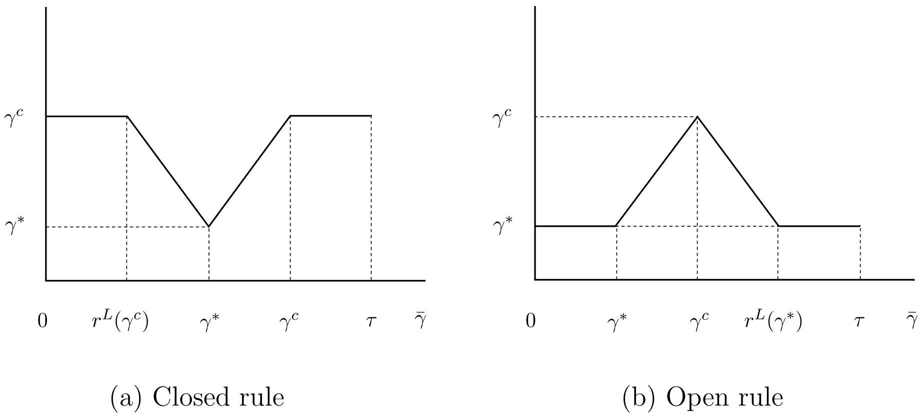


Fig. 2 Authorized expenditures

Corollary 2 *Except for $\bar{\gamma} = \gamma^*$, there is an electoral cycle with the property that*:

1. *If $\bar{\gamma} \in (r^L(\gamma^c), \gamma^c)$, then $0 \leq \Delta^s < \Delta^c$*;[7]
2. *If $\bar{\gamma} \in [0, r^L(\gamma^c)] \cup [\gamma^c, \tau]$, then $\Delta^s = \Delta^c$.*

Separation of powers moderates electoral cycles for intermediate reversion levels, and this effect is stronger the closer $\bar{\gamma}$ is to γ^*. As Fig. 2(a) illustrates, $\tilde{\gamma}_t^s$ starts at γ^c for $\bar{\gamma} = 0$, then eventually starts falling, reaching γ^* as $\bar{\gamma}$ approaches γ^*, and then starts rising again to γ^c.[8]

4.2 Open rule

Suppose now that the legislature can introduce any amendment to the executive's proposal, but the executive has veto power.

The equilibrium in the post-electoral period $t+1$ and the optimal response of voters to the observation of g_t are exactly the same. With respect to the bargaining process carried out in period t, the difference is that the role of each incumbent is reversed, so L becomes the actual agenda-setter, while E takes the position of a veto player.

For $\bar{\gamma} \in [0, \gamma^*] \cup [r^E(\gamma^*), \tau]$, the legislature would amend any executive proposal $\tilde{\gamma}_t^E \neq \gamma^*$. This amendment satisfies the incentive constraint $\tilde{\pi}^E(\gamma^*) \geq \tilde{\pi}^E(\bar{\gamma})$ (see Fig. 1). Therefore, it cannot be vetoed by E. Understanding this, E weakly prefers to make such an offer.

If $\bar{\gamma} \in (\gamma^*, r^E(\gamma^*))$, γ^* does not satisfy the incentive constraint of E. L cannot achieve its ideal policy γ^*. By the logic of the agenda-setter, L restricts player E to its reservation utility by amending any proposal $\tilde{\gamma}_t^E \neq \min\{\bar{\gamma}, r^E(\bar{\gamma})\}$. Therefore,

[7] $\Delta^s = 0$ if and only if $\bar{\gamma} = \gamma^*$.

[8] The relationship between $r^L(\bar{\gamma})$ and $\bar{\gamma}$ is not necessarily linear.

Proposition 3 *Assume there is separation of powers and open rule. With perfect compliance, there exists a unique pure strategy equilibrium such that* $\gamma^s_{t+1} = \tilde{\gamma}^E_{t+1} = \gamma^*$,

$$\gamma^s_t = \tilde{\gamma}^E_t = \begin{cases} \bar{\gamma} & \text{if } \bar{\gamma} \in (\gamma^*, \gamma^c], \\ r^E(\bar{\gamma}) & \text{if } \bar{\gamma} \in (\gamma^c, r^E(\gamma^*)), \\ \gamma^* & \text{otherwise}, \end{cases} \tag{12}$$

$\gamma^e_t = \gamma^s_t$, *and voters reelect the incumbent if and only if* $g_t/\gamma^e_t \geq \bar{\theta}$.

Corollary 3 *Except for* $\bar{\gamma} = \gamma^c$, *the electoral cycle is dampened or eliminated*:

1. *If* $\bar{\gamma} \in [0, \gamma^*] \cup [r^E(\gamma^*), \tau]$, *then* $\Delta^s = 0$;
2. *If* $\bar{\gamma} \in (\gamma^*, r^E(\gamma^*))$, *then* $0 < \Delta^s \leq \Delta^c$.[9]

With open rule, separation of powers completely eliminates electoral cycles for low and high reversion levels. For intermediate values of $\bar{\gamma}$ the electoral cycle cannot be eliminated, though its magnitude is reduced. Figure 2(b) illustrates how the graph of authorized expenditures for the open rule case has an inverse shape to that of the closed rule. Starting at γ^*, expenditures rise towards γ^c and reach it when $\bar{\gamma} = \gamma^c$, before starting to fall again.[10] This is due to the fact that the veto player has greatest power when the reversion policy is near its most-preferred policy.

Propositions 2 and 3 imply that, regardless of the initial status quo $\bar{\gamma}$, policy in electoral periods belongs to the Pareto set, i.e., $\tilde{\gamma}_t \in [\gamma^*, \gamma^c]$, while in non-electoral periods $\tilde{\gamma}_t = \gamma^*$.[11] The only difference in the density functions during electoral periods is at the boundaries: in Proposition 2, γ^c will be a mass point because E is the agenda-setter, while in Proposition 3 γ^* will be a mass point because L is the agenda-setter.

4.3 Imperfect compliance

We now generalize the results under closed rule to all $\delta \in [0, 1]$:

Proposition 4 *Assume there is separation of powers and closed rule. There exists a pure strategy equilibrium such that in the post-electoral period* $\gamma^s_{t+1} = \tilde{\gamma}^E_{t+1} = \gamma^*$, *in the electoral period authorized expenditures are given by*

$$\tilde{\gamma}^s_t = \tilde{\gamma}^E_t = \begin{cases} \frac{1}{\delta}[r^L(\delta\bar{\gamma} + (1-\delta)\tau) - (1-\delta)\tau] & \text{if } \bar{\gamma} \in (\widehat{\gamma}(\delta), \widehat{\gamma}'(\delta)), \\ \bar{\gamma} & \text{if } \bar{\gamma} \in [\widehat{\gamma}'(\delta), \widehat{\gamma}''(\delta)), \\ \gamma^c & \text{otherwise}, \end{cases} \tag{13}$$

where

$$\widehat{\gamma}(\delta) = \frac{r^L(\gamma^c) - (1-\delta)\tau}{\delta},$$

[9] $\Delta^s = \Delta^c$ if and only if $\bar{\gamma} = \gamma^c$.

[10] The relationship between $r^E(\bar{\gamma})$ and $\bar{\gamma}$ is not necessarily linear.

[11] The Pareto set or bargaining set consists of those policies that cannot be altered without making at least one of the players worse off.

$$\widehat{\gamma}'(\delta) = \frac{\gamma^* - (1-\delta)\tau}{\delta},$$

$$\widehat{\gamma}''(\delta) = \frac{\gamma^c - (1-\delta)\tau}{\delta},$$

actual expenditures are given by

$$\gamma_t^s = \min\{\delta\tilde{\gamma}_t^s + (1-\delta)\tau, \gamma^c\}, \tag{14}$$

$\gamma_t^e = \gamma_t^s$, *and voters reelect the incumbent if and only if* $g_t/\gamma_t^e \geq \bar{\theta}$.

Corollary 4 *Electoral cycles depend on the status quo and the degree of compliance*:

1. *for* $\bar{\gamma} \in (\widehat{\gamma}(\delta), \widehat{\gamma}''(\delta))$, $0 \leq \Delta^s(\bar{\gamma}, \delta) < \Delta^c$;[12]
2. *for* $\bar{\gamma} \in [0, \widehat{\gamma}(\delta)] \cup [\widehat{\gamma}''(\delta), \tau]$, $\Delta^s(\bar{\gamma}, \delta) = \Delta^c$.[13]

As the degree of compliance δ falls, the limits $\widehat{\gamma}(\delta)$, $\widehat{\gamma}'(\delta)$ and $\widehat{\gamma}''(\delta)$ shift left, affecting what L can achieve with a given status quo $\bar{\gamma}$.[14] With imperfect compliance, the legislature foresees that the executive can divert budget resources at the implementation stage, reallocating a part $1-\delta$ of any approved budget from less visible expenditure to visible expenditure (unless it can achieve γ^c with less diversion of expenditure). L incorporates that ex-post discretionality in deciding authorized spending on visible goods $\tilde{\gamma}_t^s$.

For any level of authorized expenditures $\tilde{\gamma}_t^s$, the policy implemented by the executive will be $\gamma_t = \min\{\delta\tilde{\gamma}_t^s + (1-\delta)\tau, \gamma^c\}$. That is, E will set γ_t at its most-preferred policy or, if this were not possible, it will exercise at the implementation stage the maximum degree of discretion to achieve an alternative as close as possible to γ^c.

For four different intervals of $\bar{\gamma}$, Fig. 3 shows how γ_t^s behaves as a function of δ: $(\tau - r^L(\gamma^c))/(\tau - \bar{\gamma})$ is the critical level of compliance for which $\bar{\gamma} = \widehat{\gamma}$; $(\tau - \gamma^*)/(\tau - \bar{\gamma})$ is the critical level for which $\bar{\gamma} = \widehat{\gamma}'$; and $(\tau - \gamma^c)/(\tau - \bar{\gamma})$ is the critical level for which $\bar{\gamma} = \widehat{\gamma}''$. Once compliance is below $(\tau - \gamma^c)/(\tau - \bar{\gamma})$, the moderating influence of the legislature vanishes.

Next, we generalize the results under open rule to all $\delta \in [0, 1]$.

Proposition 5 *Assume there is separation of powers and open rule. There exists a pure strategy equilibrium such that in the post-electoral period* $\gamma_{t+1}^s = \tilde{\gamma}_{t+1}^E = \gamma^*$, *in the electoral period authorized expenditures are given by*

$$\tilde{\gamma}_t^s = \tilde{\gamma}_t^E = \begin{cases} \bar{\gamma} & \textit{if } \bar{\gamma} \in (\widehat{\gamma}(\delta), \gamma^c], \\ \max\{0, \frac{1}{\delta}[r^E(\bar{\gamma}) - (1-\delta)\tau]\} & \textit{if } \bar{\gamma} \in (\gamma^c, r^E(\gamma^*)), \\ \max\{0, \widehat{\gamma}(\delta)\} & \textit{otherwise}, \end{cases} \tag{15}$$

where

$$\widehat{\gamma}(\delta) = \frac{\gamma^* - (1-\delta)\tau}{\delta},$$

[12] For $\bar{\gamma} \in [0, \gamma^*]$, there is no cycle (i.e., $\Delta^s(\bar{\gamma}, \delta) = 0$) only for the non-generic case $\bar{\gamma} = \frac{1}{\delta}[\gamma^* - (1-\delta)\tau]$.

[13] The first subset is nonempty for $\widehat{\gamma}(\delta) \geq 0$.

[14] Note that $\widehat{\gamma}(\delta) > 0$ as long as $\delta > \frac{1}{\tau}[\tau - r^L(\gamma^c)]$, and $\widehat{\gamma} \leq 0$ otherwise. Replacing $r^L(\gamma^c)$ by γ^* and γ^c, analogous remarks apply to $\widehat{\gamma}(\delta)$ and $\widehat{\gamma}''(\delta)$.

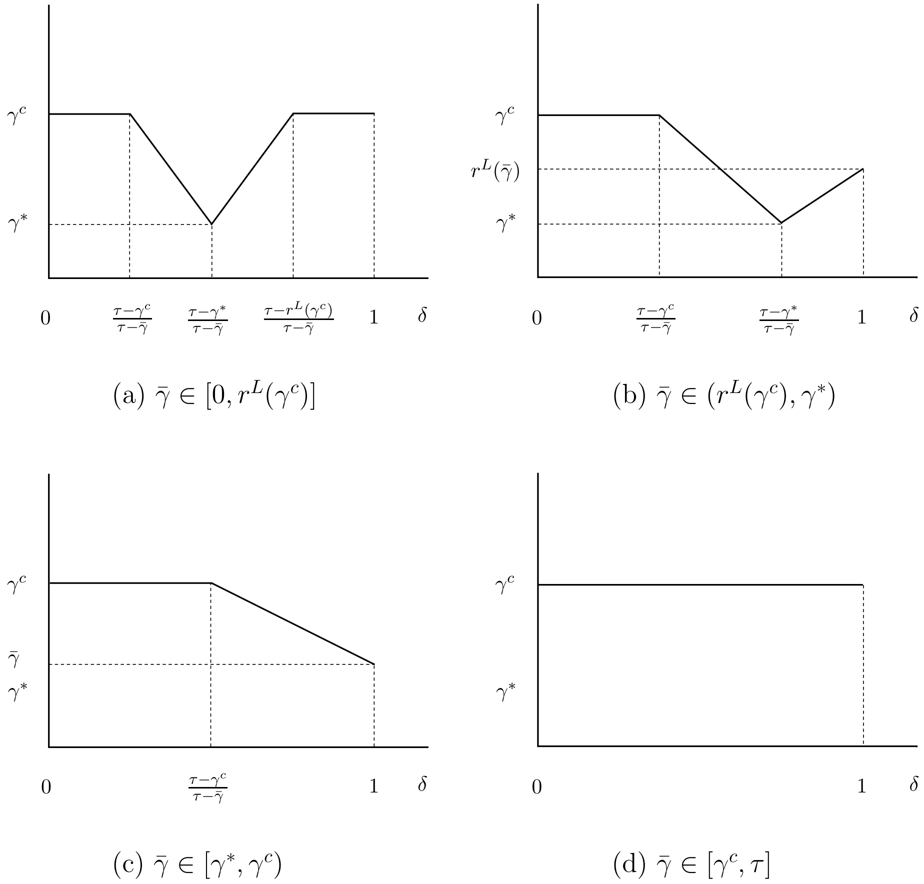


Fig. 3 Actual expenditures under closed rule

actual expenditures are given by

$$\gamma_t^s = \min\{\delta\tilde\gamma_t^s + (1-\delta)\tau, \gamma^c\}, \tag{16}$$

$\gamma_t^e = \gamma_t^s$, *and voters reelect the incumbent if and only if* $g_t/\gamma_t^e \geq \bar\theta$.

Corollary 5 *Electoral cycles depend on the status quo and the degree of compliance*:

1. *for* $\bar\gamma \in (\widehat{\gamma}(\delta), r^E(\gamma^*))$, $0 < \Delta^s(\bar\gamma, \delta) \leq \Delta^c$;
2. *for* $\bar\gamma \in [0, \widehat{\gamma}(\delta)]$, $\Delta^s(\bar\gamma, \delta) = 0$;[15]
3. *for* $\bar\gamma \in [r^E(\gamma^*), \tau]$, $\Delta^s(\bar\gamma, \delta) = 0$ *if* $\delta \geq \frac{\tau-\gamma^*}{\tau}$; $0 < \Delta^s(\bar\gamma, \delta) < \Delta^c$ *if* $\delta \in (\frac{\tau-\gamma^c}{\tau}, \frac{\tau-\gamma^*}{\tau})$; *and* $\Delta^s(\bar\gamma, \delta) = \Delta^c$ *if* $\delta \leq \frac{\tau-\gamma^c}{\tau}$;
4. *given* $\bar\gamma \in [0, \tau]$, $\Delta^s(\bar\gamma, \delta)$ *is non-increasing in* δ.

[15] The subset is nonempty for $\widehat{\gamma}(\delta) \geq 0$.

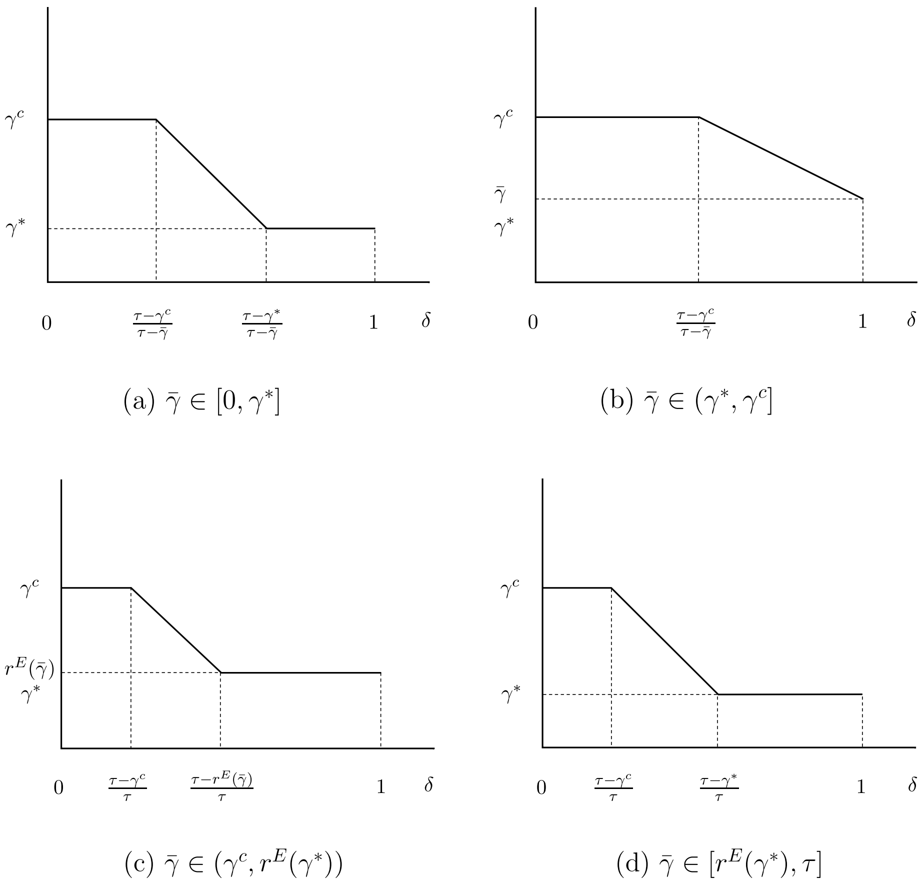


Fig. 4 Actual expenditures under open rule

For $\bar{\gamma} \in (\widehat{\gamma}(\delta), \widehat{\gamma}''(\delta))$, γ^* does not satisfy the incentive constraint of E. As the degree of compliance falls, the agenda-setting power of the legislature erodes both for low and high reversion levels, because discretion can be used by the executive to shift authorized budget expenditures from less visible items to more visible ones. For example, for $\bar{\gamma} = \tau$, as long as $\widehat{\gamma}(\delta) \geq 0$ the executive will accept $\tilde{\gamma}_t^s = \frac{\gamma^* - (1-\delta)\tau}{\delta}$, which leads to actual expenditure γ^*. Once $\widehat{\gamma}(\delta) < 0$, the legislature can at best achieve $\tilde{\gamma}_t^s = 0$, which implies $\tilde{\kappa}_t^s = \tau$; as δ keeps falling, the executive eventually will be able to achieve γ^c.

For four different intervals of $\bar{\gamma}$, Fig. 4 shows how γ_t^s behaves as a function of δ: $(\tau - \gamma^*)/(\tau - \bar{\gamma})$ is the critical level of compliance for which $\bar{\gamma} = \widehat{\gamma}$. In the generic case, γ_t^s increases as δ falls.

The moderating force of separation of powers decreases if the executive enjoys more leeway at the implementation stage.

4.4 Endogenous status quo

We now analyze what happens when an exogenous reversion policy is replaced by the previous period's budget as the default outcome, which makes the status quo endogenous. That is, while $\overline{\gamma}$ is randomly given in $t = 0$, let

$$\bar{\gamma}_t = \tilde{\gamma}_{t-1} \quad \text{for } t > 0. \tag{17}$$

Approved policy in t sets the status quo for $t + 1$. Given this path-dependency, we can no longer decompose the complete game into a sequence of independent series of elections.

Consider first a simpler problem under perfect compliance with the budget law. Suppose there is an unconstrained executive E that must formulate optimal plans $\{\gamma_{0,}\gamma_{1,}\gamma_{2,}\ldots\}$ in the initial non-electoral period $t = 0$. The objective function can be expressed as a sum of even and odd periods:

$$V_0 = E\left(\sum_{i=0}^{\infty}\beta^{2i}v(\gamma_{2i},\theta_{2i}) + \sum_{i=1}^{\infty}\beta^{2i-1}\left[v(\gamma_{2i-1},\theta_{2i-1}) + \beta\mu_{2i}^{E}(\gamma_{2i-1})\ \chi\right]\right). \tag{18}$$

Viewed from period $t = 0$, if the government sets policy in advance for all future periods, the probabilities of reelection $\mu_t^E(\gamma_t)$ in electoral periods are exogenous and equal to $1/2$ in expected value because voters will take γ_t as a given. Since electoral chances cannot be affected, the government's best policy is to pick $\gamma_t = \gamma^*$ to maximize social welfare.

The problem with this optimal plan is that it is not time-consistent: when an electoral period arrives, the government has an incentive to deviate expenditure towards visible items. This credibility problem underlies Proposition 1. What happens if the status quo is set endogenously according to rule (17)? Well, if the rule were binding, this would effectively curb the credibility problem: once the government applies optimal policy in period $t = 0$, it acts as a commitment to follow this same policy in all future periods.

However, the executive is not constrained to follow any rule unless it has to share the power to change rules with another body. If the executive is vested with legislative power, it can do and undo any rule it likes, being effectively unconstrained. The natural environment where the executive shares rule-making power is when there is separation of powers, and an agreement has to be reached with the legislature on changes in the budget. Consider $t = 0$. Though the executive can potentially engage in a PBC in period $t = 1$ if $\tilde{\gamma}_0 \neq \gamma^*$, the executive foresees that this will not enhance its electoral chances next period, so the best solution is to settle for $\tilde{\gamma}_0 = \gamma^*$. Furthermore, once $\tilde{\gamma}_0 = \gamma^*$, then $\tilde{\gamma}_t = \gamma^*$ for all $t > 0$. We detail the argument under closed rule (the argument for open rule is similar): L will veto any policy to raise $\tilde{\gamma}_t$ in electoral periods, because for any $\overline{\gamma}_t \in [\gamma^*, \gamma^c]$, such a change pushes L further away from its ideal point γ^* (that move would also push policy away from optimal policy in all future electoral periods). This specific budget rule acts as a commitment device. The incumbent can no longer affect its chances of reelection through the manipulation of fiscal policy.

With imperfect compliance, the analysis of the budget process has to take into account δ, the degree of compliance with the budget law. Under closed rule, E can propose the budget $\tilde{\gamma}_t^{E,h} = \frac{\gamma^*-(1-\delta)\tau}{\delta}$ in period $t = 0$, where the superscript h stands for history-dependent. If this solution is feasible (i.e., if $\tilde{\gamma}_t^{E,h} \geq 0$), this will lead E to implement the optimal budget that period and in all subsequent periods. Of course, L would accept. Under open rule, E would make that same proposal (otherwise, L would make that counter-proposal, which E would end up accepting). If there is a corner solution, it will not be possible to avoid cycles. More precisely, keeping in mind that $\gamma^* = \alpha\tau$,

Proposition 6 *Assume there is separation of powers and the status quo is given by the previous period's budget. There exists a pure strategy equilibrium such that* $\tilde{\gamma}_t^{s,h} =$

Table 1 Summary of results with different budget processes

Case	Closed rule	Open rule
Exogenous status quo and perfect compliance	Moderate PBC if reversion point is close to optimal allocation (Proposition 2)	Eliminate PBC if reversion point is very low or high (Proposition 3)
Exogenous status quo and imperfect compliance	Moderate PBC if compliance is high and reversion point is close to optimal allocation (Proposition 4)	Moderate PBC if compliance is high and reversion point is very low or high (Proposition 5)
Endogenous status quo: previous period's budget	Eliminate PBC if compliance is high (Proposition 6)	Eliminate PBC if compliance is high (Proposition 6)

$\tilde{\gamma}_t^{E,h} = \max\{0, \frac{\gamma^* - (1-\delta)\tau}{\delta}\}$, *for non-electoral periods* $\gamma_t^h = \gamma^*$, *for electoral periods* $\gamma_t^h = \min\{\gamma_t^c, \delta\tilde{\gamma}_t^{s,h} + (1-\delta)\tau\}$, $\gamma_t^e = \gamma_t^h$, *and voters reelect the incumbent if and only if* $g_t/\gamma_t^e \geq \bar{\theta}$.

Corollary 6 *Electoral cycles depend on the degree of compliance*:

1. *If* $\delta \geq 1-\alpha$, *then* $\Delta^h(\delta) = 0$;
2. *If* $\delta < 1-\alpha$, *then* $0 < \Delta^h(\delta) \leq \Delta^c$;
3. $\Delta^h(\delta)$ *is non-increasing in* δ.

This proposition implies that if the status quo can be approximated by the previous budget, then PBCs should be present in countries with imperfect compliance with the budget law. Institutions do not work as a commitment device when legislative oversight and enforcement is very low.

5 Discussion

We analyze a model of PBCs with asymmetric information on the actual budget allocation. With a single fiscal authority, the model has the standard prediction that the incumbent's incentive to appear competent in order to be reelected induces overspending on the more visible public good at the expense of the less visible one. The inability of the executive incumbent credibly to commit to the optimal allocation is at the heart of these electoral distortions. This credibility problem is generated by concentration of powers, which allows the executive to choose any policy it desires. Instead, under separation of powers appropriate checks and balances work as a commitment device that reduces the amplitudes of electoral fiscal cycles, making all players better off (including the executive incumbent).

With an exogenous status quo, the moderating force of separation of powers depends on the details of the budget process. When the status quo is given by the previous period's budget, the results are much crisper: PBCs only arise if there is low compliance with the budget law, i.e., if the legislature cannot oversee and enforce the effective implementation of the authorized budget. Table 1 summarizes the results.

Block (2002) finds PBCs in the composition of government spending, as modeled in this paper, but the electoral manipulation of fiscal instruments varies across countries. There is no general model of rational PBCs that explains how politicians choose among taxes, expenditure and debt. Institutional details should play an important role, insofar as the executive manipulates the fiscal instruments over which it has more discretion. For instance, the empirical evidence shows that PBCs in the budget balance tend to be more pronounced in developing countries (Shi and Svensson 2006; Persson and Tabellini 2003, Chap. 8) and in new democracies (Brender and Drazen 2005). Schuknecht (1996) suggests that there should be more room for fiscal manipulation in developing countries because checks and balances usually are weaker there, precisely the logic analyzed in this paper.[16] These institutional considerations may also be important for monetary policy: Grier (2008) uncovers a sizeable opportunistic business cycle in the United States, where the interaction of the President with the FED may be a key factor.

Our results are derived in a stationary environment where the optimal budget allocation is constant over time. In equilibrium, voters infer actual budget expenditure, which allows them to estimate the incumbent's competence once the actual supply of the visible public good is observed. Alternatively, voters could be treated as amateurs, in contrast to politicians who are professionals. Indeed, since Downs (1957), it is clear that for rational voters it does not make sense to solve a complicated game if it is costly to decide how to vote optimally, because an individual vote cannot affect electoral outcomes (hence, rationally uninformed voters). What happens instead if, for example, voters rely only on the past history of the budget process? In our stationary environment, voters would be able to predict expenditure on the visible good using a simple adaptive rule ($\gamma_t^e = \gamma_{t-2}$), i.e., adaptive expectations are rational in this environment.

In a stochastic environment, one can conjecture that the endogenous status quo may be optimal if shocks to the desired budget allocation follow a random walk. What may change the results more fundamentally is relaxing the assumption that the legislature has no electoral stake. In this regard, our model is the best case scenario where the legislature tries to ensure that the socially optimal policy is followed.

An endogenous status quo given by the previous period's budget is used in practice. For example, McCubbins et al. (2007) distinguish for the U.S. federal government between entitlements and laws without sunset provisions, where the reversion point is a continuation of the status quo, and budgets and sunset provisions, where the reversion point is no policy at all. Though the reversion point for entitlements is similar to our endogenous status quo, for discretionary spending, which can be more easily manipulated in PBCs, the reversion point according to the U.S. Constitution is a zero budget.

Our budget rule is similar to the proposals put forth by the U.S. Congress in 1997 for an "automatic continuing resolution" to fund spending at 100% of the prior year's level, in order to avoid government shutdowns during funding gaps in which agency appropriations had not been enacted into law (Keith 1999). However, this proposal was vetoed by the president, in principle because the onus of government shutdowns seems to fall principally on Congress.[17]

The executive as agenda-setter (closed rule) is applied more often in Europe, Asia and Latin America, where the executive can unilaterally issue decrees, than in the United States (McCubbins et al. 2007, pp. 47–48). In these countries, our results can be related to the criticisms of zero budget rules, which, among others, Shepsle and Bonchek (1997) consider to be more detrimental than reverting to the past budget because they give the agenda-setter huge power. In our stationary environment, this endogenous status quo allows the optimal policy to be implemented every period.

[16] In relation to this, Streb et al. (2005) find empirically that effective checks and balances moderate PBCs in the budget deficit.

[17] Keith (1999) focuses on the tardy enactment of the federal budget almost every year since 1952. The U.S. Congress has turned to "continuing resolutions" to provide stopgap funding. This has become more critical since 1980, due to a stricter enforcement of the law that has led to the shutdown of non-essential government services during funding gaps.

Our results contrast with the view in Rogoff (1990) that constitutional amendments to curb cycles destroy valuable information. In the Rogoff model, incumbents decide policy after observing their type, unlike our model where they decide under uncertainty, before observing their type. However, this is not the reason for the discrepancy. Consider how Rogoff dismisses a proposal by Tufte (1978) to set fiscal policy in off-election years on a biennial basis. Since policy is set in off-electoral years before the incumbent knows its type, Rogoff concludes that all incumbents *provide* the same amount of the visible public good in electoral years, thus destroying the informative content of this signal for voters. However, if one draws a distinction between the budget process and the provision of public goods, the Tufte proposal can be interpreted in another way: all incumbents *spend* the same amount on the visible public good; since competent incumbents can provide more of the public good with that expenditure, in equilibrium voters are able to tell competent and incompetent incumbents apart. Hence, Tufte's restriction need not destroy any information. The same logic applies to our budget rule by which non-electoral years set the status quo for electoral years.

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