

ELECTIONS, FISCAL POLICY AND GROWTH: Revisiting the mechanism

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Abstract: This paper reconsiders the popular result that the lower the probability of getting re-elected, the stronger the incumbent politicians' incentive to follow short-sighted, inefficient policies. The set-up is a general equilibrium model of economic growth, in which fiscal policy is endogenously chosen under electoral uncertainty. Political parties can value possible economic benefits differently depending on whether they are in or out of power, and - by contrast with the literature - the relevant preference coefficient is a choice variable rather than an exogenous taste parameter. The main result is that, when political parties choose both economic policy instruments and preference coefficients, the deep reason for short-sighted policy is the extra rents from being in power per se.

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I. INTRODUCTION

Policymakers are elected for a finite term and know they will be replaced in the future by another group. This affects their behavior in several ways.¹ One way is that uncertainty about remaining in office induces policymakers to choose relatively short-sighted policies and engineer electoral business cycles, which in turn is bad for macroeconomic performance [see e.g. Alesina and Tabellini (1990), Lockwood et al. (1996), Devereux and Wen (1998) and Persson and Tabellini (1999)]. The idea is that electoral uncertainty induces incumbent governments not to fully internalize the future costs of current policies, since these costs are borne only if the government gets reelected. Then, the lower the probability of getting reelected, the stronger the incumbent's incentive to follow short-sighted, inefficient policies.²

The present paper revisits this mechanism. Its aim is twofold. First, to reveal the type of political preferences that lead to the popular predictions mentioned above. Second (and more importantly), to go deeper by searching for the economic determinants of these political preferences. That is, we investigate the fundamental motives for short-sighted policies.³ Understanding political parties' motives is important if one wants to develop some normative views about the proper design of governments.

The model is as follows. We use a general equilibrium model of economic growth and endogenous fiscal policy, in which two political parties can alternate in power according to an exogenous reelection probability. The elected party forms a government that sets fiscal policy during its term in office. Specifically, it taxes private agents' income to finance public consumption services. Political parties can value possible economic benefits differently depending on whether they are in or out of power; to the extent that this is a choice variable, rather than an exogenous taste parameter, we add something new to the literature. Political parties' economic benefits are obtained from macroeconomic outcomes (in particular, private consumption and public consumption services) and from being in power per se. That is, there are separate benefits from holding office. Political parties play Nash vis-à-vis

¹ See Drazen (2000, chapter 7.1) for the main (positive and negative) effects of electoral uncertainty.

² Different papers have studied different types of short-sighted policies (e.g. too big government sectors, over-issue of public debt, changes in spending patterns in favor of non-productive government activities, or poor enforcement of property rights). See Persson and Tabellini (1999) for a survey.

³ Or what Persson et al. (2000) call "micropolitical foundations".

each other. We will solve for a Markov-perfect equilibrium, in which (Nash) policies are time consistent.

Our results are as follows. We first solve for fiscal policy, by taking as given political parties' preferences over how much to value economic benefits when in relative to out of power. We can get the main result of the literature (i.e. incumbent governments find it optimal to choose short-sighted policies), only if we assume that political parties value economic benefits more when in than out of power. On the contrary, if it so happens that they value them the same, they find it optimal to choose long-sighted policies; in particular, in this case, policies are independent of election uncertainty and are similar to those of a single government that is certain to remain in office forever.

In other words, our results reveal that the key assumption behind the main result of the literature is that politicians care about economic outcomes more when in than out of power.⁴ This is the assumption that the literature has, implicitly or explicitly, made. Specifically, in Alesina and Tabellini (1990), Devereux and Wen (1998) and Persson and Tabellini (1999) alternating policymakers have different objectives (they care about different public goods or care differently about the same public good),⁵ which effectively means that they are assumed to care differently about economic outcomes in and out of power. Lockwood et al. (1996) make this assumption explicitly.

We then ask the natural question, "What is the optimal weight given to possible economic benefits when in relative to out of power?". This is determined by maximizing the political parties' expected incremental value of following short-sighted policies rather than behaving like a single, long-sighted government. Using the properties of Markov chains with stationary transition probabilities, we show that it is optimal to choose short-sighted policies, only if there are separate, extra benefits from holding office. On the contrary, if there are no such benefits, it is optimal to choose long-sighted policies. Intuitively, if the parties were rational, and there is nothing extra to gain from being in power, they would like to eliminate the impact of electoral uncertainty.

⁴ There is evidence from the political science literature that politicians do not care (or care less) about the economy when out of power (see e.g. Laver and Hunt (1992)). Lockwood et al. (1996, 2001) provide formal support for this prediction when they use UK and Greek postwar data.

⁵ As Alesina and Tabellini (1990) point out, policy inefficiency is a result of electoral uncertainty and disagreement between alternating governments (concerning the composition of public spending).

Therefore, when reelection is uncertain, the deep reason for short-sighted, opportunistic policies is the extra rents earned at the voters' expense. These are defined to be "the monopoly rents that a government can create or increase" (see Drazen (2000, chapter 8)). From a normative point of view, our results provide one more argument in favor of constitutional and political reforms (monitoring, information to the public, credible punishment of political corruption, etc) that increase political competition, reduce rent creation and seeking, and hence give incentives for more far-sighted and efficient economic policies.⁶

The rest of the paper is organized as follows. Section II describes the model. Section III solves for a competitive equilibrium. Sections IV and V model the behavior of politicians. Section VI concludes.

II. DESCRIPTION OF THE MODEL AND DEFINITION OF EQUILIBRIUM

Description of the model

Consider a closed economy with a private sector and two political parties. The private sector consists of a single private agent, who makes the usual consumption-saving decisions to maximize inter-temporal utility. Production of output takes place through a linear AK technology. There are also two political parties, which alternate in power according to an exogenous reelection probability, where elections are held every time period.⁷ The elected party forms a government, which taxes the private agent's income to finance government consumption services. The latter provide direct utility to private agents. We assume discrete time and infinite time-horizons for private agents and politicians.

In each time period, the timing of events is as follows: first, political parties choose how much to value economic benefits when in and out of power; in turn, the political party that has won the election sets fiscal policy during its term in office; third, the representative private agent makes his/her consumption-saving choices.

Our model will be a variant of the Devereux and Wen (1998) model. Namely, a dynamic general equilibrium model of economic growth, in which fiscal policy is endogenously chosen under electoral uncertainty. We choose to work in the context of

⁶ See e.g. Laffont (1999) and Drazen (2000, chapter 10). As Moore (1992, pp. 188-9) points out, we do not need only game theory, but also implementation theory. That is, how to design the political game.

⁷ These assumptions will be discussed in section IV below.

a growth model because it is widely believed that politics in general, and electoral uncertainty in particular, are crucial factors in the growth process (see e.g. Drazen (2000, chapter 11)). On the other hand, our model differs from that in Devereux and Wen (1998) because here political parties can value possible economic benefits differently depending on whether they are in or out of power, and (more importantly) the relevant “preference coefficient” is a choice variable rather than an exogenous taste parameter. In other words, the novel element in our paper relative to the literature is the first step/event described above.

Definition of equilibrium

It is known that when taxes are distorting, optimal policy can be time inconsistent when policymakers are free to re-optimize.⁸ We will therefore solve for Markov policy strategies, which are time consistent. Thus, policy strategies will depend on the current value of the relevant state variables only.⁹

Within each time period t , we will solve the problem by backward induction. Thus, the next section III will solve the third, last stage of the game. In particular, we will solve for a competitive equilibrium, given fiscal policy and political parties’ preferences. Then, section IV will endogenize fiscal policy (second stage). When the party in power chooses its fiscal policy, it will take into account the outcome of the previous stage. Finally, section V will choose political parties’ preferences over how much to value economic benefits when in and out of power (first stage). In doing so, parties will take into account the outcomes of all previous stages. We will focus on symmetric Nash strategies among political parties. That is, in equilibrium, parties’ choices will be alike.¹⁰ Therefore, a Markov-perfect equilibrium will be a subgame-perfect symmetric Nash equilibrium.

III. THE ECONOMY AND COMPETITIVE EQUILIBRIUM

This section will solve for a competitive equilibrium, given fiscal policy and political parties’ preferences.

⁸ For the credibility problem in the context of fiscal policy, and a survey of the literature, see Persson and Tabellini (1999, section 5).

⁹ For the properties of Markov policy strategies in a macro setting, see e.g. Obstfeld (1991).

¹⁰ Thus, we do not study partisan effects. In this paper, the focus is on electoral uncertainty. See below for more details about symmetric policy strategies.

Behavior of private agents

The infinitely-lived private agent maximizes:

$$\sum_{t=0}^{\infty} \beta^t u(c_t, h_t) \quad (1a)$$

where c_t and h_t are respectively private consumption and government consumption at time t , and the parameter $0 < \beta < 1$ is the discount rate. The instantaneous utility function $u(\cdot)$ is increasing and concave, and also satisfies the Inada conditions. For simplicity, we assume that $u(\cdot)$ is additively separable and logarithmic:

$$u(c_t, h_t) = \log c_t + \delta \log h_t \quad (1b)$$

where the parameter $\delta \geq 0$ is the weight given to government consumption services relative to private consumption.

In each period t , the private agent's budget constraint is:

$$k_{t+1} + c_t = (1 - \theta_t) A k_t \quad (2)$$

where k_t is the beginning-of-period capital stock, $A > 0$ is a technological parameter, and $0 < \theta_t < 1$ is the current income tax rate. For simplicity, we assume full capital depreciation. The initial capital stock, k_0 , is given.

The private agent acts competitively by taking prices, tax policy and public services as given. We will solve this problem by using dynamic programming. From the private agent's viewpoint, the state variables - at any time t - are k_t and θ_t .¹¹ Let $U(k_t; \theta_t)$ denote the private agent's value function at t . This function satisfies the Bellman equation:

$$U(k_t; \theta_t) = \max[\log c_t + \delta \log h_t + \beta U(k_{t+1}; \theta_{t+1})] \quad (3)$$

The private agent chooses c_t and k_{t+1} to solve (3) subject to (2). The first-order condition for k_{t+1} and the envelope condition for k_t are respectively:

$$\frac{1}{c_t} = \beta U_k(k_{t+1}; \theta_{t+1}) \quad (4a)$$

$$U_k(k_t; \theta_t) = \frac{(1 - \theta_t)A}{c_t} \quad (4b)$$

Government's budget constraint

The government balances its budget in each period t , so that:¹²

$$h_t = \theta_t A k_t \quad (5)$$

Competitive equilibrium

Given the path of the income tax rate, $\{\theta_t\}_{t=0}^{\infty}$, and the initial condition for the capital stock, k_0 , a Competitive Equilibrium (CE) is defined to be the paths of the end-of-period capital stock, private consumption and government expenditures, $\{k_{t+1}, c_t, h_t\}_{t=0}^{\infty}$, such that: (i) private agents maximize utility given prices and policy; (ii) all markets clear; (iii) all budget constraints are satisfied. This CE is characterized by equations (1)-(5) above. The rest of this section will take advantage of the specific functional forms used in order to get a convenient closed-form analytic solution for this CE. Then, we get:¹³

¹¹ As the government budget constraint reveals (see equation (5) below), the current tax rate, θ_t , can fully summarize fiscal policy in each time period.

¹² Thus, for simplicity, there is no public debt.

¹³ We work as follows: In a CE, the structure of the problem implies a conjecture of the value function in (3) of the form $U(k_t; \theta_t) = u_0 + u_1 \log k_t + u_2 \theta_t + u_3 \log \theta_t$, where (u_0, u_1, u_2, u_3) are undetermined coefficients. Then, the optimality conditions (4a) and (4b) give (6a) and (6b). Plugging (6a) and (6b) back into (3), and equating coefficients on both sides of the Bellman, we can solve for (u_0, u_1, u_2, u_3) . Note, however, that while we are able to solve for u_1 at this early stage, we cannot solve for u_0, u_2 and u_3 before we also solve for policy in the next sections. This is how it should be in a general equilibrium model where policy is endogenously chosen. Also, note that a closed-form analytic solution in (6a)-(6b) follows from the structure of the model: log-linear utility functions, Cobb-Douglas production functions and full capital depreciation.

Result 1: *In a Competitive Equilibrium, for any (Markov) policy, optimal private consumption and capital accumulation are given by:*

$$c_t = (1 - \beta)(1 - \theta_t)Ak_t \quad (6a)$$

$$k_{t+1} = \beta(1 - \theta_t)Ak_t \quad (6b)$$

We sum up this section. Equations (6a), (6b) and (5) give c_t , k_{t+1} and h_t respectively in a Competitive Equilibrium (CE). This is for any (Markov) fiscal policy, where fiscal policy is summarized by the tax rate, θ_t . Notice that the CE is a function of the current state only (i.e. the predetermined capital stock, k_t , and the current policy instrument, θ_t). This will make the political parties' optimization problem recursive, and hence optimal policies will be time consistent.

IV. CHOOSING FISCAL POLICY WHEN IN OFFICE

This section will endogenize fiscal policy chosen by the party in power.

Political parties and the electoral process

To endogenize fiscal policy, we will form a Nash game between two political parties, denoted by i and j , which alternate in power according to an exogenous reelection probability.¹⁴ For simplicity, we assume that elections take place in each time period t .¹⁵ Thus, the party in power at time t has a probability $0 \leq q \leq 1$ of winning the next election and remaining in power at time $t + 1$, and a probability $0 \leq (1 - q) \leq 1$ of losing the next election and being out of power at $t + 1$.

The elected party chooses its preferred fiscal policy, θ_t , to maximize its own well-being (we specify political parties' objective functions in (7a)-(7b) below). In

¹⁴ Having endogenous reelection probabilities would not change our main results. For instance, assume that the reelection probability increases with current growth. This would give an incentive to the party in power to follow more long-sighted policies (so as to stimulate growth) than in the case in which the reelection probability is exogenous, but it would still be the case that, since the reelection probability is less than one, policies are less long-sighted than in the case without electoral uncertainty. In general, although there is feedback from policy and the state of the economy to reelection probabilities, the assumption that this probability is exogenous "means that there is some underlying exogenous stochastic process that makes the outcomes of elections uncertain" [see Drazen (2000, p. 256)].

¹⁵ See also Alesina and Tabellini (1990) and Devereux and Wen (1998) for a similar electoral calendar. Lockwood et al. (1996) use a richer model in which the electoral cycle lasts two time-periods so that the elected party can remain in power for two periods. Our main results do not depend on this.

doing so, the elected party takes into account the CE, as summarized by (6a), (6b) and (5) above. It also plays Nash *vis-a-vis* the other party, which may be in power in the future. That is, when party i is in power at time t and chooses current policy, θ_t^i , it takes as given the policy of the other party, θ_{t+1}^j , where $j \neq i$, which may be in power at $t+1$ with probability $(1-q)$.

Problem formulation

We will solve the political parties' optimization problem by using dynamic programming. From the parties' viewpoint, the state variable at any time t is the economy's predetermined capital stock, k_t . We will formulate the case of party i (party j 's case is symmetric). Let $V^{P_i}(k_t)$ and $V^{N_i}(k_t)$ be respectively the value functions of being in and out of power for party i at time t . Then, $V^{P_i}(k_t)$ and $V^{N_i}(k_t)$ satisfy the pair of simultaneous Bellman equations:

$$V^{P_i}(k_t) = \max_{\theta_t^i} [\gamma_t^i (E^{P_i} + \log c_t + \delta \log h_t) + \beta [q V^{P_i}(k_{t+1}) + (1-q) V^{N_i}(k_{t+1})]] \quad (7a)$$

$$V^{N_i}(k_t) = (1 - \gamma_t^i) (\log c_t + \delta \log h_t) + \beta [(1-q) V^{P_i}(k_{t+1}) + q V^{N_i}(k_{t+1})] \quad (7b)$$

where $0 \leq \gamma_t^i \leq 1$ denotes how much party i evaluates economic benefits when in power relative to out of power, and the parameter $E^{P_i} \geq 0$ is an exogenous benefit associated with being in power. That is, while economic outcomes (c_t and h_t) are enjoyed irrespectively of the election result, E^{P_i} is conditional on being in power.¹⁶ To express it in a different way (see Persson and Tabellini (1999, p. 1452)), political parties are both "outcome motivated" and "office motivated".

Party i chooses θ_t^i to solve the problem in (7a)-(7b), subject to equations (6a), (6b) and (5) for c_t , k_{t+1} and h_t respectively (γ_t^i will be chosen in the next section). Inspection of this problem reveals that we have to solve a dynamic programming problem with a log-linear payoff function and Cobb-Douglas

¹⁶ A non-zero value for E^{P_i} captures non-benevolent behavior on the part of politicians (compare it with equation (1b) above), while a positive value for E^{P_i} also implies extra rents at the private agent's

constraints. Thus, the functional formulation of the policymakers' problem is similar to that of the private agents'. This means that the value functions in (7a)-(7b) are expected to be of the log-linear form $V^P(k_t) = u_0^P + u_1^P \log k_t$ and $V^N(k_t) = u_0^N + u_1^N \log k_t$, where $(u_0^P, u_1^P, u_0^N, u_1^N)$ are undetermined coefficients.

We will assume that policy choices, θ_t^i and γ_t^i , are independent of the inherited capital stock and time (we shall show below that this is the case indeed, in equilibrium).¹⁷ Thus, from now on, we set $\theta_t^i \equiv \theta^i$ and $\gamma_t^i \equiv \gamma^i$ for all t .

Choice of tax policy (θ)

Using the above conjecture for the value functions into (7a)-(7b), deriving the first-order condition for θ^i in (7a),¹⁸ imposing the symmetricity conditions $\theta^i = \theta^j \equiv \theta$, $u^P = u^j \equiv u^P$ and $u^N = u^i \equiv u^N$,¹⁹ plugging in turn the optimality condition for θ back into (7a)-(7b), and equating coefficients on both sides of the two Bellman equations, we solve for the undetermined coefficients $(u_0^P, u_1^P, u_0^N, u_1^N)$. Then, in a symmetric Nash equilibrium in policies among political parties, we have (from now on, we drop the superscripts i and j , that show the parties' identity):

Result 2: *Given how much political parties value economic benefits when in power relative to out of power (γ), and focusing on Markov policy strategies in a symmetric Nash Equilibrium among political parties, there is a unique solution for the income tax rate (θ), and the associated level of government expenditures (h). In particular, for all t , the solution for θ is:*

expense. Note that we could add a political benefit, $E^{N_i} \geq 0$, even when out of power in (7b); our results will not change, as long as we assume $E^P > E^N$ (see below).

¹⁷ Intuitively, it is optimal to keep distorting policy instruments flat over time. This form of "tax smoothing" introduces fewer inter-temporal distortions.

¹⁸ Thus, party i chooses the current tax rate, θ^i , to maximize the right-hand side of $u_0^P + u_1^P \log k_t = \max \left[\gamma^i (E^P + \log[(1-\beta)(1-\theta^i)Ak_t]) + \delta \log[\theta^i Ak_t] + \beta q (u_0^P + u_1^P \log[\beta(1-\theta^i)Ak_t]) + \beta(1-q)(u_0^N + u_1^N \log[\beta(1-\theta^j)Ak_t]) \right]$ by taking θ^j as given.

¹⁹ That is, political parties are alike ex post. This is not too restrictive, since here we focus on the effects of electoral uncertainty, and such effects can be captured even by a symmetric equilibrium. This becomes obvious by comparing this case to the simple case in which parties are alike ex ante: as the previous footnote shows, the latter case is reduced to a single party problem that remains in power forever without electoral uncertainty (see e.g. Malley et al. (2002) for this simple case).

$$0 < \theta = \frac{\gamma\delta}{\gamma\delta + \Omega} < 1 \quad (8)$$

where,

$$\Omega \equiv \gamma + \beta[qu_1^P + (1-q)u_1^N]$$

$$u_1^P = \frac{\gamma(1+\delta)(1-\beta q) + \beta(1-\gamma)(1+\delta)(1-q)}{(1-\beta)(1+\beta-2\beta q)} > 0$$

$$u_1^N = \frac{(1-\gamma)(1+\delta)(1-\beta q) + \beta\gamma(1+\delta)(1-q)}{(1-\beta)(1+\beta-2\beta q)} > 0.^{20}$$

Thus, $\theta = \theta(\gamma; q, \beta, \delta)$. Most of the literature has focused on the effect of the reelection probability, q , on fiscal policy, where the latter is here summarized by the tax rate, θ . Equation (8) implies $\frac{\partial \theta}{\partial q} = \frac{\partial \theta}{\partial \Omega} \frac{\partial \Omega}{\partial q}$. In other words, the channel through which q affects θ is the “effective” discount rate, Ω . Comparative static exercises show that the sign of $\frac{\partial \Omega}{\partial q}$ is ambiguous depending on the magnitude of γ .²¹

In particular, there are three cases: (i) If $\gamma > 0.5$, then $\frac{\partial \Omega}{\partial q} > 0$ and therefore

$\frac{\partial \theta}{\partial q} < 0$. That is, when political parties value economic benefits more when in than

out of power, a decrease in the reelection probability leads to a decrease in the effective discount rate. Then, since the future is less valuable, the government chooses a higher government consumption-to-output ratio, and hence a higher tax rate required to finance its expenditures. This in turn causes lower economic growth (see (6b)

above). This is the popular case. (ii) If $\gamma < 0.5$, then $\frac{\partial \Omega}{\partial q} < 0$ and therefore $\frac{\partial \theta}{\partial q} > 0$.

That is, results are reversed when political parties value economic benefits more when out than in power. (iii) If $\gamma = 0.5$, then $\frac{\partial \Omega}{\partial q} = 0$ and therefore $\frac{\partial \theta}{\partial q} = 0$. That is, when

political parties value economic benefits the same whether in or out of power, the

²⁰ $(1 + \beta - 2\beta q)$ is positive so that the solution is well defined. The value functions in (7a)-(7b) are increasing and concave.

²¹ Specifically, $\frac{\partial \Omega}{\partial q} = \frac{-(1+\delta)(1-2\gamma)}{(1+\beta-2\beta q)^2}$.

effective discount rate is unaffected by electoral uncertainty, so that policy instruments and economic growth are also independent of election outcomes. Actually, equation (8) implies that the value of θ when $\gamma = 0.5$ (for any value of $0 \leq q \leq 1$) is the same as the value of θ when $q = 1$ (for any value of $0 \leq \gamma \leq 1$). Specifically, in both cases,²² $\theta = \frac{\delta(1-\beta)}{(1+\delta)}$. Recall that the case $q = 1$ is the case in

which there is no electoral uncertainty, so that the government is certain to remain in office forever, and hence fully internalizes the future costs of higher government consumption today (see (7a)-(7b) above).

Without loss of generality, we will focus on the intuitive cases (i) and (iii). As said in the Introduction above, most of the literature has, implicitly or explicitly, studied case (i) only. Proposition 1 summarizes results in this section:

Proposition 1: (a) *When political parties value possible economic benefits more when in than out of power (i.e. $\gamma > 0.5$), incumbent governments find it optimal to choose short-sighted, inefficient policies. In particular, the lower the reelection probability, the stronger the incentive to follow short-sighted policies. This case generates the popular electoral business cycle.* (b) *When political parties value possible economic benefits the same irrespectively of whether they are in or out of power (i.e. $\gamma = 0.5$), they find it optimal to choose long-sighted policies. In particular, economic policies are independent of reelection probabilities and are similar to those of a single government that is certain to remain in office forever.*

Therefore, the rationality of short-sighted policies, and hence electoral cycles, depends crucially on the magnitude of γ , and in particular on whether γ is higher than 0.5. But if γ is itself endogenous, what is its optimal value?

V. CHOOSING HOW MUCH TO CARE WHEN IN AND OUT OF POWER

This section will endogenize the choice of γ , i.e. how much should political parties value economic benefits when in relative to out of power. This is the first stage

²² That is, when $\gamma = 0.5$ or $q = 1$.

of the game. When political parties choose the value of γ , they take into account the results of all previous stages. The solution for γ will also complete the Markov-perfect general equilibrium solution.

We showed in the previous section that if γ is higher than 0.5, it is optimal to follow short-sighted economic policies. If, however, γ equals 0.5, it is optimal to follow long-sighted policies, as if there is no electoral uncertainty. Then, the right condition for us is to require that γ should maximize the political parties' expected incremental value of following short-sighted policies rather than behaving like a single, long-sighted government.²³ We therefore define a function $P(\gamma)$:²⁴

$$\begin{aligned}
P(\gamma) \equiv & \\
& \gamma \sum_{t=0}^{\infty} \beta^t \left[\pi_t (E^P + \log c_t + \delta \log h_t) \right] + (1-\gamma) \sum_{t=0}^{\infty} \beta^t \left[(1-\pi_t) (\log c_t + \delta \log h_t) \right] \\
& - 0.5 \sum_{t=0}^{\infty} \beta^t \left[\pi_t (E^P + \log \tilde{c}_t + \delta \log \tilde{h}_t) \right] - 0.5 \sum_{t=0}^{\infty} \beta^t \left[(1-\pi_t) (\log \tilde{c}_t + \delta \log \tilde{h}_t) \right] \quad (9)
\end{aligned}$$

That is, this function denotes how much it is worth engineering electoral business cycles (i.e. $\gamma > 0.5$) rather than not (i.e. $\gamma = 0.5$).²⁵ Here, π_t and $(1-\pi_t)$ are respectively the probabilities of being in power and out of power at any time $t \geq 0$, and variables with tildes denote values that correspond to an equilibrium without electoral cycles (i.e. the special case in which $\gamma = 0.5$).²⁶

²³ There is a clear analogy to problems of valuing different options. For instance, a firm may find it optimal to be “active” or “passive” (see e.g. Dixit (1991) and Dixit and Pindyck (1994)). In such problems, since the boundaries linking the different options or regimes are themselves free, we need extra conditions to determine the optimal values of the boundaries (the so-called smooth-pasting conditions). Then, as Dixit and Pindyck (1994, p. 109) point out, “the conditions applicable to free boundaries are specific to the each application and must come from economic considerations”. This is what we do here (actually, see Dixit and Pindyck (1994, pp. 219-220) for a problem formulation similar to ours). Also, note that the other optimality conditions (the so-called value matching conditions) have already been satisfied, since we have solved for optimal fiscal policy in the previous section by matching the two value functions in the two inter-linked dynamic programming problems in (7a)-(7b) (see the simultaneously solved undetermined coefficients $u_0^P, u_1^P, u_0^N, u_1^N$).

²⁴ Recall that policy strategies are time- and state-invariant (we will show that this is the case indeed, in equilibrium). With more general functional forms, we could have $P(\gamma_t; k_t)$.

²⁵ Without loss of generality, we ignore the counter-intuitive case in which $\gamma < 0.5$.

²⁶ See the analysis below equation (8) for the solution when $\gamma = 0.5$.

Political parties choose γ to maximize (9) subject to (5), (6a), (6b) and (8) for h_t, c_t, k_{t+1} and θ respectively. To solve this problem, we need to model the path of probability π_t . Appendix A deals with this technical issue by using the properties of finite Markov chains with stationary transition probabilities. For algebraic simplicity, we will assume that the probability of winning the coming election is the same as the probability of losing it (i.e. $q = \frac{1}{2}$).²⁷ Then, $\pi_t = (1 - \pi_t) = \frac{1}{2}$ for all t . Therefore, the problem is to choose γ to maximize (see Appendix A for details):

$$P(\gamma) = \frac{1}{2} \frac{(\gamma - 0.5)E^p}{(1 - \beta)} + \frac{1}{2} \left[\frac{(1 + \beta\delta)}{(1 - \beta)^2} (\log(1 - \theta) - \log(1 - \tilde{\theta})) + \frac{\delta}{(1 - \beta)} (\log \theta - \log \tilde{\theta}) \right] \quad (10)$$

where, θ is given by (8) above, and $\tilde{\theta}$ is the special case of (8) in which $\gamma = 0.5$.

The first-order condition for γ is:

$$\frac{E^p}{(1 - \beta)} = - \frac{(\delta(1 - \beta - \theta) - \theta)}{(1 - \beta)^2(1 - \theta)\theta} \frac{\partial \theta}{\partial \gamma} \quad (11)$$

where, from (8), $\frac{\partial \theta}{\partial \gamma} = \frac{\beta\delta(1 + \delta)(1 - q)}{(1 - \beta)(1 + \beta - 2\beta q)(\gamma\delta + \Omega)^2} > 0$.

Equation (11) is nonlinear so that an analytic solution in closed form is not possible. However, Appendix B proves that:

Result 3: Equation (11) gives a unique solution for γ . In particular, for all t , if $E^p > 0$, this solution lies in the region $0.5 < \gamma \leq 1$; while if $E^p = 0$, this solution is $\gamma = 0.5$.

Therefore, in this section, we have shown:

²⁷ Alesina and Tabellini (1990) also work around $q = \frac{1}{2}$. This is not restrictive when one solves for symmetric equilibria.

Proposition 2: *Given Proposition 1 and Result 3 above, and if political parties also choose how much to value economic benefits when in power relative to out of power, it is optimal to them to choose short-sighted fiscal policies, only if there are extra benefits obtained from holding office (i.e. $E^P > 0$). If there are no such benefits (i.e. $E^P = 0$), it is optimal to choose long-sighted fiscal policies.*

Finally, note that if politicians enjoy extra benefits not only when in power, but also when out of power (i.e. if we add $E^N \geq 0$ in equation (7b) above), we would have $E \equiv (E^P - E^N)$ instead of E^P in equation (11). In this more general case, Result 3 would change to: if $(E^P - E^N) > 0$, then $\gamma > 0.5$; while if $(E^P - E^N) = 0$, then $\gamma = 0.5$. Therefore, non-benevolence ($E^P, E^N \neq 0$) is not enough to justify short-sighted policies. The key assumption is that politicians' extra benefits when in power are higher than those when out of power ($E^P > E^N$). The assumption $E^P > E^N$ is standard in the literature.

Numerical results

To illustrate our theoretical results, we will also present some numerical examples. Recall that the politicians' optimisation problem is summarized by equations (8) and (11), whose solution gives general equilibrium values for γ and θ . We set the following parameter values: $\beta = 0.8$ for the discount factor (see (1a)); $\delta = 0.3$ for the weight given to public relative to private consumption (see (1b)); $q = 0.5$ for the probability of winning the coming election (see (7a)-(7b)). We then examine the effects of a changing E^P , i.e. the incumbent's extra rents, whose value is the driving force of the theoretical results presented above. Results are reported in Table 1 below.

Table 1 here

The solutions for γ and θ are well defined. They in turn give reasonable results for the growth rate, $g \equiv \frac{k_{t+1} - k_t}{k_t}$, given by equation (6b). That is, an increase in E^P leads to a monotonic increase in γ and θ , which in turn leads to lower and lower g . Intuitively, the possibility of higher monopoly rents from being in power

increases the incentive for short-sighted economic policies (here, in the form of high government consumption-to-output ratio) in an attempt to remain in office, and this is bad for economic growth.

VI. CONCLUSIONS AND DISCUSSION

This paper reconsidered the effect of electoral uncertainty on fiscal policy and economic growth. We assumed that political parties can value possible economic benefits differently depending on whether they are in or out of power, and (more importantly) that the relevant “preference coefficient” is a choice variable rather than an exogenous taste parameter. This is more than a technical exercise for, at least, two reasons. First, it is a real-world assumption. Politicians do care differently about different problems, and this depends crucially on whether they are in or out of power. Here, we asked, “Why?”. Second, since it is basically the value of this preference coefficient that drives the main result in the literature, it is important to understand its economic determinants. This enabled us, among other things, to investigate the circumstances under which it is actually optimal for policymakers to follow short-sighted policies, or whether this is just a phenomenon of myopia and irrationality.

The bottom line is that when both economic policy instruments and preference coefficients are chosen, the rationale for short-sighted policies is the extra rents from holding office per se. If there are no such rents, there are no reasons for short-sighted policies (at least in the context used by the literature). To put it differently, we need an additional political distortion to explain short-sighted policies and electoral cycles. Electoral uncertainty is not enough. Here, we focused on the extra rents associated with office-holding, and on irrationality on the part of politicians. Which is the right interpretation (extra rents or irrationality) is an empirical matter.²⁸

The analysis was deliberately carried out in a simple framework. For instance, we used specific functional forms. This made the model tractable and enabled us to get a closed-form analytic solution of a rather complex problem (a three-stage game with structural dynamics). Also, our functional forms have been widely used by the

²⁸ The early literature has emphasized the role of irrationality on the part of politicians who act in ways that imply that either themselves suffer from fiscal illusion, or that they believe voters are myopic, or both [see e.g. Mueller (1989, chapters 14 and 17)]. Of course, there are other possible distortions/explanations. For instance, in Laffont (2000), asymmetric information is the additional

growth literature. Allowing for more general forms could make the political parties' optimal strategies time- and state-dependent, but we believe it would not change our qualitative conclusions. In general, we think that the framework used is realistic and rich enough to capture the main issues in the debate about the real motives of politicians.²⁹

We close with two possible extensions. First, here we studied the policy level by taking the electoral level as given. For instance, we did not examine the pre-election decisions of political parties and the voting decisions of private agents-voters. While this is rather usual practice in the literature (i.e. to focus only on one level), we realize that a more complete analysis should include both levels (see e.g. Myerson (1999)). Second, here we took the monopoly rents from being in power as exogenous. It would be interesting to endogenize them. That is, to explain the way through which incumbent politicians can create, and increase, political monopoly rents (see e.g. Mueller (1989, chapter 13) and Drazen (2000, chapters 8 and 10)). We leave these extensions for future research.

distortion (however, it is difficult to believe that informational advantages on the part of policymakers can explain the systematic growth of public sectors in the last 40 years).

²⁹ See Persson et al. (2000) for a rich model in which politicians are driven by their own selfish objectives, there is no direct democracy so that citizens delegate policy decisions to policy-makers, and political candidates cannot pre-commit themselves to policies ahead of elections.

APPENDIX

A. From equation (9) to equation (10):

Equations (7a)-(7b) imply that, from the viewpoint of policymakers, the transition between the two regimes (in and out of power) is a first-order Markov process with two states, where the probability of remaining in the same state is q and the probability of switching state is $(1-q)$. In other words, we have a finite Markov chain with stationary transition probabilities. In cases like this, it is known how to model the probability of being in one of the possible regimes in each time period (see e.g. DeGroot (1989, chapter 2.3)). Here, it is more convenient to model these probabilities by using Hamilton's (1989) methodology. Assume that there is a stochastic variable S_t that can take two realizations, 1 and 0. Without loss of generality, regime 1 is identified as being in power, and regime 0 is identified as being out of power, where the transition probabilities are as said above. Then, by applying equations (2.1)-(2.7) in Hamilton's paper, it directly follows that conditional on information available at time 0, the conditional probability of being in power at time $t \geq 0$ is:

$$\pi_t = \frac{1}{2} + (2q-1)^t \left(q - \frac{1}{2} \right) \quad (\text{A.1})$$

For simplicity, we will solve the problem only around $q = \frac{1}{2}$ (see also Alesina and Tabellini (1990, Proposition 3)). In other words, we assume that the probability of winning the coming election is the same as the probability of losing it. Then, we simply have $\pi_t = (1 - \pi_t) = \frac{1}{2}$, for all t . Then, equation (9) in the text becomes:

$$P(\gamma) = \frac{1}{2} \frac{(\gamma - 0.5)E^P}{(1 - \beta)} + \frac{1}{2} \sum_{t=0}^{\infty} \beta^t [\log c_t + \delta \log h_t] - \frac{1}{2} \sum_{t=0}^{\infty} \beta^t [\log \tilde{c}_t + \delta \log \tilde{h}_t] \quad (\text{A.2})$$

Using equations (5), (6a), (6b) and (8) for h_t, c_t, k_{t+1} and θ respectively, making successive forward substitutions, and expanding the resulting geometrically declining polynomials, it is straightforward to show that equation (A.2) gives equation (10) in the text.

B. Proof of Result 3:

Our task is to solve equation (11) for γ . We will first specify the region in which a solution (if any) should lie, and then establish existence and uniqueness of such a solution. We start with the first step. Since $E^p > 0$ and $\frac{\partial \theta}{\partial \gamma} > 0$, (11) implies $(\delta(1-\beta-\theta)-\theta) < 0$, or $\theta > \frac{\delta(1-\beta)}{(1+\delta)}$. But since $\theta = \frac{\delta(1-\beta)}{(1+\delta)}$ when $\gamma = 0.5$, and also $\frac{\partial \theta}{\partial \gamma} > 0$, this means that only if $\gamma > 0.5$, we can have $\theta > \frac{\delta(1-\beta)}{(1+\delta)}$. Notice that if $E^p = 0$, then $(\delta(1-\beta-\theta)-\theta) = 0$, or $\theta = \frac{\delta(1-\beta)}{(1+\delta)}$ which is associated with $\gamma = 0.5$.

We will now study whether such a solution actually exists and is unique. With $E^p > 0$, and hence $\gamma > 0.5$, the right-hand side of (11), denoted as $RHS(\gamma) > 0$, is increasing in γ (this follows from the second-order condition of the maximization problem in (10)). If we also assume that the parameter values satisfy $RHS(1) > \frac{E^p}{(1-\beta)} \equiv LHS$ for existence of a solution, then we have a unique solution for γ as shown in Figure 1 below (where, for simplicity, we draw $RHS(\gamma) > 0$ as a linear function).

Figure 1 here

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Figure 1

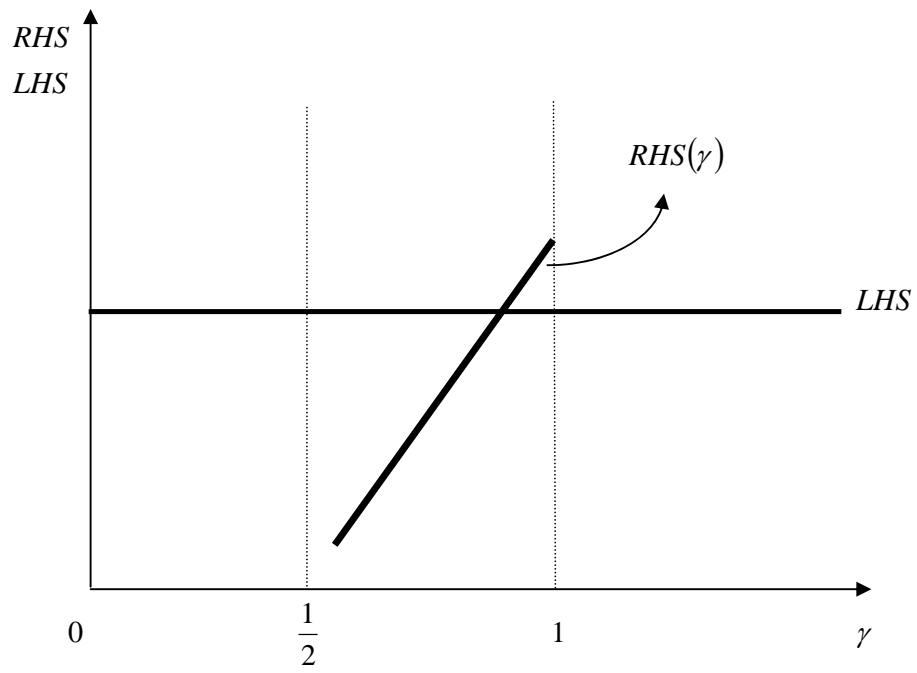


Table 1

E^p	γ	θ	g
0	0.5		
0.01	0.513	0.047	
0.03			
0.05			
0.07			
0.09			
0.11			
0.13			

Note: $\beta = 0.8, \delta = 0.3, q = 0.5, A = ?$. We use ...