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Political Transfer Cycles

Frank Bohn

Pierre-Guillaume Méon

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Frank Bohn*, Radboud Universiteit Nijmegen

Pierre-Guillaume Méon, Université Libre de Bruxelles

January 2009

Abstract

This paper analyses transfers around elections in an opportunistic political business cycle (PBC) model with moral hazard. As some voters are uninformed, the government can improve reelection chances by increasing debt-financed transfers before elections and cutting transfers to repay the debt after elections. Transfer cycles are shown to depend on the dispersion of information among voters, the politicians' rent-seeking motive, and the output effect of government manipulations.

JEL classification: D72, E32, E62, H62.

Keywords: political budget cycles, deficit bias, fiscal policy,
           near-rationality, asymmetric information.

*Corresponding author: Radboud University Nijmegen, Department of Economics (Thomas van Aquinos-traat 5.1.14), P.O. Box 9108, 6500 HK Nijmegen, The Netherlands, phone: +31-24-36-15507, fax: +31-24-36-12379, email: f.bohn@fm.ru.nl.

1 Introduction

After more than thirty years of research, the theory of political business cycles (PBCs) spurred by Nordhaus (1975) has changed focus in several ways. The first change in focus results from the increased recognition that monetary policy is not the main tool of electioneering. That point is made by Drazen (2001), who stresses that the evidence to support a monetary policy-induced business cycle is weak. More precisely, there is no support to the idea that aggregate economic activity is boosted before elections, at least not in OECD countries. Alt and Chrystal (1983) had already come to that conclusion when surveying the earlier empirical literature, and Faust and Irons (1999) added more recent support to the same claim. The rejection of a monetary-induced political business cycle (PBC) does not mean that the whole existence of political business cycles has been rejected. On the contrary, there is strong evidence of fiscal cycles. Namely, the debt levels have been found to increase prior to elections in industrial countries by Alesina et al. (1992, 1993) or Alesina and Roubini (1990). Drazen (2001) emphasises that there is evidence of pre-electoral increases in transfers and other fiscal policy instruments in several countries. In developing countries, there seems to be even more support for political fiscal cycles. Evidence of opportunistic cycles in budgets and transfers is reported by Block (2002), Schuknecht (1996, 2000), Shi and Svensson (2006), or Vergne (forthcoming).

The groundwork for a theory of the political *budget* cycle was laid by Rogoff and Sibert (1988) and Rogoff (1990). In their papers, incumbents use debt-financed public goods to signal their competence and increase their reelection prospects. More recent contributions stressing the key role of fiscal policy include Drazen (2001) and Shi and Svensson (2006). A problem with almost all of these models is that output is kept exogenous and feedback effects are ignored. Only Drazen (2001) allows a feedback effect of the budget cycle onto output through, admittedly, ad hocish monetary policy in what he calls an active fiscal, passive monetary policy (AFPM) model.

A second shift in focus in the literature on political business cycles follows the more general

departure of the macroeconomics literature from models based on fully rational behaviour. Near-rational behaviour has thus been modelled by Akerlof and Yellen (1985)[1] or Mankiw and Reis (2002). Near-rational behaviour may affect the aggregate because deviations from rational behaviour by many individuals may add up. But it may also affect the aggregate because a policymaker counts on the mistakes made by individuals and adjusts her policy behaviour. The more individuals make mistakes, the larger should be the policy effect. There is no reason why near-rational behaviour should remain confined to the economic realm. If some agents make their economic decision in a near-rational way, they should a fortiori make their political decisions in a near-rational way. In fact, the impact of an individual agent's vote is limited, and the incentive to get informed is small. It is not surprising that agents hold biased beliefs on the economy and economic policies, as Caplan (2002, 2006) documents. To our knowledge, the only attempt so far to consider near-rational voters is Shi and Svensson (2006), who assume that a share of the electorate is uninformed.

In this paper, we probe deeper in how near-rational behaviour affects the macroeconomy in a political budget cycle setting. We construct a parsimonious fiscal policy model capturing deficits and transfers on the one hand and an opportunistic PBC-type model on the other hand. Voting behaviour is near-rational in the sense that a fraction of voters is not able to or does not bother to acquire full information about the actions of the policymaker. This tempts the incumbent government to try to look more competent than it is by providing individuals with large transfers, the level of which can be observed by everybody. Even though voters do not have full information, they anticipate that the government tries to suggest higher competence by increasing the level of deficit-financed transfer payments. Based on our model, we can show that an increase in the share of informed voters and an increase in politicians' political rents raises the equilibrium level of transfers and deficits. Transfer and deficit cycles emerge.

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[1] They define near-rational behaviour as "behavior that is perhaps suboptimal but that nevertheless imposes very small individual losses on its practitioners [i.e. individual agents] relative to the consequences of their first-best policy. ... [It] can nevertheless cause first-order changes in real activity [i.e. in the aggregate]".

We then extend the analysis by endogenising output. As in Drazen (2001), we model the fiscal policy effect via output on utility in addition to its direct effect on utility. Drazen postulates an aggregate supply function and studies the effect of fiscal policy under alternative monetary policies. By contrast, we propose a very general Keynesian demand function. We consider expansionary and/or contractionary multiplier effects as well as fiscal policy effects under full employment versus boom or slack. Up to this point, we have considered a simple policy effect of near-rational individual behaviour: the policymaker adjusts transfers and deficits to the informational deficiencies of individuals given a fixed level of output. Now we can also take the effect of government manipulations onto output into account. As a consequence, the deficit level optimally chosen by the government is affected in two ways. First, if deficit finance has a less expansionary or more contractionary effect onto output, a politically motivated government prefers less deficit because the positive impact of manipulations is reduced. Second, if an economic boom is expected, the government responds by reducing the deficit level because the effect of deficit finance is smaller when the economy is already somewhat overheated. The political transfer cycle is dampened, i.e. the government acts anticyclically, compared to a situation without a boom. We obtain two intuitive and testable predictions. We are, however, not aware of empirical studies on these issues, be they supportive or contradictory.

It is instructive to compare this paper more closely with Rogoff (1990) and the theory part in Shi and Svensson (2006). All three papers are inspired by Rogoff's (1990) critique of the traditional PBC literature logic. Rogoff points out that rational voters should not let their expectations about postelection performance be influenced by preelection budgets. All three paper model the voting outcome, more plausibly, as a function of voters' expectations about the candidates' performance *after* elections. In Rogoff (1990) the political budget cycle is caused by the incumbent's ability to observe her own competence before the general public. Here and in Shi and Svensson (2006), the political budget cycle is produced by an information asymmetry between private agents which affects the public's overall perception

4

of the policymakers' competence. A share of the population is uninformed because they shy away from acquiring information that is costly or, as Shi and Svensson suggest, because their access to information is restricted. In this sense, we and Shi and Svensson assume some near-rationality due to an information asymmetry.[2] In two other respects, this paper is different to both Rogoff (1990) and Shi and Svensson (2006). First, it responds to the empirical finding that it is mainly transfers that are increased in pre-election years. Thus, we focus on political transfer cycles, whereas Rogoff (1990) and Shi and Svensson (2006) model the public goods provision. Second, we capture the interdependence between output and deficit/debt, whereas output is exogenous and constant both in Rogoff (1990) and in Shi and Svensson (2006).

In sections 2 and 3, we present the basic model and its solution. We will show that transfer cycles depend on the share of uninformed voters and on the magnitude of the rent the incumbent receives from staying in power. Section 4 extends the model to incorporate the interrelation between (deterministic or stochastic) output and rational political manipulations of deficits and transfers by policymakers. Section 5 concludes with a summary of the findings and suggestions for future research.

2   Transfer Model

In this model, every second period an incumbent politician and a challenger representing different parties run for office. If both are purely opportunistic, voters' utility, however, does not hinge on economic considerations alone, but also on a more or less strong personal predisposition or sympathy for one of the candidates.[3] The utility function for any voter i

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[2] In contrast, Rogoff's (1990) information asymmetry has nothing to do with near-rationality because there individuals could not even potentially choose to obtain the information earlier and achieve the first best optimum.

[3] Henceforth the terms voter and individual (agent) are used interchangeably. Similarly, the terms politician and policymaker are also used as synonyms. Furthermore, we associate the incumbent with party a and the challenger with party b without limiting the generality of the analysis.

reflects both economic and non-economic components:

$$U_t^i = \sum_{s=t}^{T} [c_s + \alpha \theta^i z_s]. \tag{1}$$

The economic component c_s (consumption) and the sympathy component $\theta^i z_s$ are additively-separable with relative weight α in each period. Discounting between periods could be added, but does not contribute to substance nor exposition. Utility derived from sympathy is constrained to $\theta^i z_s = [-\frac{1}{2}, \frac{1}{2}]$ since z_t is either $-\frac{1}{2}$ (when party a is elected) or $+\frac{1}{2}$ (when party b is elected); and the personal sympathy parameter θ^i is uniformly distributed over the interval $[-1, 1]$.[4] The sympathy component represents any attribute of the candidates that does not affect economic policies, be it their stance on societal issues or their good looks. As in Shi and Svensson (2006), there are two kinds of voters. Informed voters observe all variables in the economy, uninformed voters can only observe a subset.[5] Both politicians $j = a, b$ face a similar utility function as voters consisting of an economic and a non-economic component. The non-economic component is, however, the political rent X_t that policymakers receive from being in power:

$$V_t^j = \sum_{s=t}^{T} [c_s + X_s]. \tag{2}$$

Voters' and politicians' consumption alike are constrained by each agent's net-of-tax income y_t and transfers t_t:

$$c_t = y_t + t_t. \tag{3}$$

The government budget constraint is

$$t_t = D_t - R(D_{t-1}) + \eta_t^j, \tag{4}$$

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[4] If individual i has somewhat more sympathies for party a, say at $\theta^i = -\frac{1}{2}$, then her utility derived from sympathy is positive ($\frac{1}{4}$), if party a is elected ($z_i = -\frac{1}{2}$); but it is negative ($-\frac{1}{4}$), if party b is elected ($z_i = \frac{1}{2}$).

[5] This is explained at the end of this section. Confer the paragraph on the timing of events on page 7.

where D measures debt, R depicts repayment, and η is the incumbent's competence. Transfers are determined by the policymaker in power. They are intertemporal transfers, not income redistribution. They allow more government subsidies or benefits. Transfers are deficit-financed, i.e. it depends on debt minus repayment. (Repayment function R is assumed to be positively sloping and convex with $R(0) = 0$.) However, the total amount of transfers also depends on incumbent politician j's competence in period t, η_t^j.[6] Competence η_t^j consists of skills shocks for this period and for last period. Each skills shock is a random variable with mean 0, distribution function $F(\bullet)$ and density function $f(\bullet)$. Past shocks are common knowledge, but current or future shocks are unknown to both policymakers and private agents. One-period competence persistence is modeled as an MA(1) process:[7]

$$\eta_t^j = \mu_t^j + \mu_{t-1}^j. \tag{5}$$

Instead of equation (4) a fuller fiscal model could be used, but results are identical. In that case, let variable y_t be gross income and t_t depict net transfers, i.e. t_t is negative and the absolute value of t_t represents taxes minus transfers. Taxes would be used to finance a fixed amount of public goods. The question would then be: how much can we reduce the tax burden by deficit finance?[8]

The timing of events is as follows. In period t, the incumbent sets deficit level D_t, thus providing transfers for the public according to equation (4). Voting individuals observe

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[6] For $\eta_t^j > 0$, (net) transfers t would surpass the net deficit, $D_t - R(D_{t-1})$. In a developing country, we could interpret η_t^j as the government's ability to secure foreign aid, which does not have to be repaid. In any country, it may also reflect its ability to seize and exploit profitable investment opportunities.

[7] Limited persistence is a compromise. It allows some persistence, but acknowledges that competence also changes over time as new tasks for politicians emerge. The model would also work without persistence, i.e. $\eta_t^j = \mu_t^j$, but would not be easily solvable for persistence longer than 1 period. Rogoff's suggestion of an MA(1) process is one of two conditions for splitting the model into separate 2-period cycles (each consisting of an election period and an off-election period) as is so common in this literature. Confer the discussion of deficit repayment in the off-election period in the paragraph on the timing of events on page 7.

[8] A recent example is the discussion about a previously abolished commuter tax relief (Pendlerpauschale) in July 2008 in Germany. For obvious political reasons some politicians, especially from the Bavarian CSU party, which faced an upcoming election, wanted to reintroduce this tax relief at the expense of achieving a balanced budget sooner rather than later.

transfer level t_t and past skills shock μ_{t-1}^j. Only informed voters observe D_t, uninformed voters do not. This assumption simplifies the reality of hidden accounts and disguised information about government finances.[9] Informed voters can deduce current skills μ_t^j, and can, therefore, extract information about the future competence of the incumbent, which the uninformed voters cannot. Then, informed and uninformed voters cast their vote based on their different information sets. What matters is that some voters are imperfectly informed. Given that the probability of being pivotal is almost zero, there is no incentive for becoming informed by gathering costly information in order to improve one's electoral choice. In period $t + 1$, the winner (incumbent or challenger) takes office. Voters do not matter any more because they cannot vote in period $t+1$. Politicians want to repay the previous period deficit because the deficit is costly[10] and voters cannot sanction the policymaker for reducing transfers, i.e. effectively levying additional taxes, to finance deficit repayment. Individuals anticipate in election period t that politicians will repay the deficit in the off-election period $t + 1$.

3   Model Solution

The model is solved in three steps. First, we can determine the probability that an individual agent votes for the incumbent, to whom we refer to as party a, without loss of generality. Second and on this basis, we can derive the probability for the incumbent to win the election

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[9] Prima facie, it may seem strange that a fraction of voters should be uninformed about the deficit or, at least, ignore the deficit in their economic considerations. Since the Maastricht criteria at the latest we are used to extensive discussions of deficit levels and deficit reduction strategies. However, some countries managed to manipulate their deficit numbers prior to the start of the European Monetary Union, for instance by falsifying their figures or hiding social security debt. Furthermore, remember that deficit levels were, at least in many European countries, of little concern in the 1970s and early 1980s. In developing countries, it is even more obvious that a fraction of society is not informed and/or does not incorporate deficit numbers into their economic calculations.

[10] Repayment is guaranteed, technically, because the marginal utility of additional deficit (through its 1-for-1 effect on transfers and, finally, on consumption) is 1 (given that the discount factor is 1), whereas the marginal cost ($R'(D)$) and, therefore, the marginal disutility is greater than 1. The unity marginal utility assumption is also used by Shi and Svensson (2006) for the same purpose as here, albeit with respect to the public goods consumption. – With less restrictive assumptions, we could get a rising trend in debt.

for a given level of transfers, which depend on the deficit level and the competence level of the incumbent. Third, we can maximise the incumbent's expected utility over any 2-period cycle, i.e. period t utility *plus* period $t+1$ utility in case of winning the election multiplied by the probability of winning (as determined in step 2) *plus* period $t+1$ utility in case of losing multiplied by the probability of losing. Assuming exogenous income, we derive the first order condition (FOC) to characterise the optimal level of deficit. In the the next section we relax the exogenous income assumption.

In the first step, we consider an individual voter. She will vote for incumbent a, if

$$\underbrace{E_t[c_{t+1}^a + \alpha\theta^i(-\frac{1}{2})]}_{\text{exp. utility when } a \text{ in power}} \quad > \quad \underbrace{E_t[c_{t+1}^b + \alpha\theta^i(+\frac{1}{2})]}_{\text{exp. utility when } b \text{ in power}} \quad . \tag{6}$$

Depending on who is in power, $t+1$ consumption will typically differ because of differences in policymakers' competence[11] and individuals' expectations about it:

$$E_t[c_{t+1}^a] = E_t[y_{t+1}] + E_t[t_{t+1}^a]; \qquad E_t[c_{t+1}^b] = E_t[y_{t+1}] + E_t[t_{t+1}^b]; \tag{7}$$

$$t_{t+1} = -R(D_t) + \eta_{t+1}. \tag{8}$$

Period $t+1$ government budget constraint (8) says that the period t deficit must be repaid in period $t+1$.[12] As a result, $t+1$ transfers are negative (taxes) corresponding to deficit repayment modulo the effect of the policymaker's competence. Individuals have no idea about the skills shock of either policymaker in $t+1$. Nor do they know the skills shock of the challenger in period t. However, they can use the incumbent's period t deficit policy to draw conclusions about her skills shock in period t.

$$E_t[t_{t+1}^b] \quad = \quad -E_t[R(D_t^*)]. \tag{9}$$

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[11] We assume here that output does not depend on which policymaker is in power, an assumption we shall relax in section 4.

[12] Remember that policymakers will not borrow in period $t+1$ because there is no election at the end of that period. Confer the discussion in the paragraph on the timing of events on page 7.

$$E_t[t_{t+1}^a] \quad = \quad -E_t[R(D_t^*)] + E_t[\mu_t^a], \tag{10}$$

where D_t^* denotes the equilibrium level of deficit, which also corresponds to the incumbent's optimal period t choice for the deficit (to be determined further down). Combining equations (6) to (10) we obtain a condition for an individual to vote for incumbent a:

$$E_t[\mu_t^a] \quad > \quad \alpha\theta^i. \tag{11}$$

Using the distribution of the skills shock we can determine the probability (Pr) of an individual voter, informed or uninformed, to vote for incumbent a:

$$Pr[E_t[\mu_t^a] - \alpha\theta^i \geq 0] \quad = \quad \frac{E_t[\mu_t^a] - (-\alpha)}{\alpha - (-\alpha)} \quad = \quad \frac{E_t[\mu_t^a]}{2\alpha} + \frac{1}{2}. \tag{12}$$

In step 2, we determine the probability $Prob$ that incumbent a obtains 50% of the votes in period t elections. It is the probability that the number of voters times their individual probability Pr to vote for incumbent a (as determined in equation 12) is greater or equal to $\frac{1}{2}$. However, the individual probability Pr is different for informed and uninformed voters because their expectations of period t skills, $E_t[\mu_t^a]$, are different. Hence

$$\text{Prob}\left\{ \sigma\underbrace{[\frac{E_t[\mu_t^a]}{2\alpha} + \frac{1}{2}]}_{\text{informed}} \quad + \quad (1-\sigma)\underbrace{[\frac{E_t[\mu_t^a]}{2\alpha} + \frac{1}{2}]}_{\text{uninformed}} \quad \geq \quad \frac{1}{2} \right\}. \tag{13}$$

So why is there a difference in expectations for informed and uninformed voters? Consider the government budget constraint for period t:

$$t_t = D_t + \eta_t \tag{14}$$

Remember that policymakers will not borrow in off-election periods because higher transfers and appearing more competent does not affect the duration of the incumbent's time in office.

Without debt in off-election period $t-1$ there is no repayment in election period t. Equation (14) can be rewritten as follows:

$$\eta_t \;=\; t_t - D_t$$

$$E_t[\mu_t^a] = \mu_t^a \;=\; t_t - D_t - \mu_{t-1}^a \tag{15}$$

The point is that informed voters can determine $E_t[\mu_t^a]$ deterministically, because they can observe D_t. By contrast, uninformed voters must form an estimate of the incumbent's skills, $\widehat{\mu_t^a}$, based on their estimate for the deficit level, $\widehat{D_t}$:

$$\widehat{\mu_t^a} \;=\; t_t - \widehat{D_t} - \mu_{t-1}^a \tag{16}$$

$$\text{or} \qquad \widehat{D_t} = t_t - \widehat{\mu_t^a} - \mu_{t-1}^a$$

$$\widehat{\mu_t^a} \;=\; \underbrace{t_t - D_t - \mu_{t-1}^a}_{\mu_t^a \text{ from (15)}} + D_t - \widehat{D_t} \tag{17}$$

$$E[\mu_t^a] \;=\; \mu_t^a + D_t - \widehat{D_t} \tag{18}$$

Using equations (15) and (18) we can now determine the probability that incumbent a receives 50% of the votes in period t:

$$\text{Prob}\ \left\{ \sigma[\frac{\mu_t^a}{2\alpha} + \frac{1}{2}] \;+\; (1-\sigma)[\frac{\mu_t^a + D_t - \widehat{D_t}}{2\alpha} + \frac{1}{2}] \;\geq\; \frac{1}{2} \right\}$$

$$=\ \text{Prob}\ \left\{ \frac{\mu_t^a}{2\alpha} \;+\; (1-\sigma)\frac{D_t - \widehat{D_t}}{2\alpha} \;+\; \frac{1}{2} \;\geq\; \frac{1}{2} \right\}$$

$$=\ \text{Prob}\ \left\{ \mu_t^a \;\geq\; (1-\sigma)(\widehat{D_t} - D_t) \right\} \tag{19}$$

$$=\ 1 \;-\; F[(1-\sigma)(\widehat{D_t} - D_t)], \tag{20}$$

where $F(\bullet)$ is the distribution function of the skills shock.

In step 3, we can maximise incumbent a's utility over the entire election cycle, i.e. periods t and $t+1$. Period $t+1$ utility is the sum of the utilities for winning and losing the election weighted by the probability determined in step 2:

$$max_{D_t} \quad E_t\{y_t + D_t + \eta_t^a + X\}$$

$$+E_t\{\underbrace{[1 - F[(1-\sigma)(\widehat{D_t} - D_t)]]}_{\text{prob. incumbent wins}} \quad [y_{t+1} - R(D_t) + \eta_{t+1}^a + X]\}$$

$$+E_t\{\underbrace{[F[(1-\sigma)(\widehat{D_t} - D_t)]]}_{\text{prob. incumbent loses}} \quad [y_{t+1} - R(D_t) + \eta_{t+1}^b]\} \quad (21)$$

Assuming constant income and the incumbent's knowledge about her past, but not her present and future skills (and not the skills shock of the challenger), the maximisation problem looks as follows:

$$max_{D_t} \quad \bar{y} + D_t + \mu_{t-1}^a + X$$

$$+\bar{y} - R(D_t)$$

$$+[1 - F[(1-\sigma)(\widehat{D_t} - D_t)]]X \quad (22)$$

Differentiation with respect to D_t produces the following FOC:

$$1 - R'(D_t) + (1-\sigma)F'[(1-\sigma)(\widehat{D_t} - D_t)]X = 0 \quad (23)$$

We argued before that both informed and uninformed private agents anticipate that the government tries to cheat. Thus $D_t^* = D_t = \widehat{D_t}$ is an equilibrium condition. Inserted into the FOC, we obtain:

$$1 + (1-\sigma)f[0]X = R'(D_t^*) \quad (24)$$

Applying total differentials to the FOC tells us what affects the optimal level of borrowing. We obtain the following perturbation results with respect to political rent X and share of informed voters σ:

$$\frac{\mathrm{d}D^*}{\mathrm{d}X} > 0 \qquad\qquad \frac{\mathrm{d}D^*}{\mathrm{d}\sigma} < 0 \tag{25}$$

Higher political rents and more uninformed voters increase optimal borrowing. Intuitively, if the ego rent of being in power increases, then the incentive to distort the economy also increases. The incumbent will be more willing to increase debt to appear more competent in the eye of voters. Furthermore, increasing the share of informed voters reduces the efficiency of electioneering because fewer voters can be fooled before elections.

4 Endogenising Output

It is one of the weaknesses of Rogoff (1990) and Shi and Svensson (2006) as well as this paper thus far that output is kept exogenous. Let us now account for the interdependence between deficit/debt and output. We postulate a very general formulation, which allows a deficit-financed fiscal policy to produce both expansionary and/or contractionary effects. In each period, we assume transfers to have a linear effect on output:

$$y_t = \bar{y} + bt_t \tag{26}$$

Coefficient b could be interpreted as multiplier, but, a priori, it could be positive or negative. Of course, it is most likely that there is some positive effect in the period when the deficit occurs and some negative effect in the repayment period. Inserting equations (14) and (8), respectively, we obtain the following output equations (with $b_1 \neq b_2$ and both positive typically):

$$y_t = \bar{y} + b_1(D_t + \eta_t)$$

$$y_{t+1} = \bar{y} + b_2(-R(D_t) + \eta_{t+1}) \tag{27}$$

Incorporating the output effect of deficit finance into the analysis affects the individual's choice of who to vote for (step 1), but not the probability that incumbent a receives 50% of the vote (step 2). Instead of (22) we now obtain the following maximisation problem:

$$max_{D_t} \quad \bar{y} + (1 + b_1)(D_t + \mu_t^a) + X$$

$$+ \bar{y} - (1 + b_2)R(D_t)$$

$$+ [1 - F[(1 - \sigma)(\widehat{D_t} - D_t)]]X \tag{28}$$

Note that the exogenous output case discussed in section 3 is a special case with $b_1 = b_2 = 0$. Instead of (24) the first order condition becomes:

$$(1 + b_1) + (1 - \sigma)f[0]X = (1 + b_2)R'(D_t^*) \tag{29}$$

We still obtain that the incumbent's optimal D depends positively on the ego rents X and the share of uninformed voters $1 - \sigma$, but we can also obtain perturbation results for the multipliers b_1 and b_2:

$$\frac{\mathrm{d}D^*}{\mathrm{d}b_1} > 0 \qquad\qquad \frac{\mathrm{d}D^*}{\mathrm{d}b_2} < 0 \tag{30}$$

If the expansionary effect of deficit finance on current output (measured by b_1) increases (or the contractionary effect decreases), the government will optimally choose to increase the level of deficit. If a tool is more effective, it is optimal to use it more. The second result concerning b_2 is the analogue. If the negative effect of deficit repayment on future output is increased (or the positive effect reduced), a politically motivated government will borrow less. Overall this means that, if deficit finance becomes more contractionary, be it in t or $t+1$, the deficit and transfer cycle will be less pronounced. We can also compare our results to those obtained for exogenous output. If deficit finance has, overall, a positive effect, the government will exploit the situation and exacerbate the cycle.

In a second extension, we would like to capture the effect of a shock on the deficit and transfer cycle. The output function must be changed in two ways. First, any shock augments or reduces $\bar{y}$. Second, any shock will affect the impact of deficit financed transfers on output, i.e. the multiplier. If the economy is already overheated, a further deficit financed impulse should be less expansionary. Conversely, under a negative output shock the economy should benefit more from stimulated output. Both changes to output function (27) can be expressed as follows:

$$y_t = \bar{y} + E(\epsilon_1) + b_1 \frac{\bar{y}}{\bar{y} + E(\epsilon_1)}[D_t + \eta_t]$$

$$y_{t+1} = \bar{y} + E(\epsilon_2) + b_2 \frac{\bar{y}}{\bar{y} + E(\epsilon_2)}[-R(D_t) + \eta_{t+1}] \tag{31}$$

Again, the individual's choice of who to vote for (step 1) is affected, but not the probability that incumbent a receives 50% of the vote (step 2). Note that both the exogenous output case and the previous extension are special cases of this extension. We now obtain the following FOC:

$$(1 + b_1 \frac{\bar{y}}{\bar{y} + E(\epsilon_1)}) + (1 - \sigma)f[0]X = (1 + b_2 \frac{\bar{y}}{\bar{y} + E(\epsilon_2)})R'(D_t^*) \tag{32}$$

The previously obtained results continue to be valid. But we can now also consider the effect of expected output shock on the political deficit and budget cycle. It does, however, not matter for the optimal deficit choice by the incumbent, if the output shock will actually occur or not.

$$\frac{\mathrm{d}D^*}{\mathrm{d}E_t(\epsilon_1)} < 0 \qquad\qquad \frac{\mathrm{d}D^*}{\mathrm{d}E_t(\epsilon_2)} > 0 \tag{33}$$

If policymakers think there will be a positive output shock in period t or a negative output shock in period $t + 1$, then a politically motivated government should borrow less, because the expansionary effect of deficit finance is diminished in a boom. Compared to a non-boom situation the policymaker behaves anticyclically.

5 Conclusion

This paper contributes to the theoretical political budget cycle literature. We acknowledge and model the empirical findings that political business cycles are mainly spurred by transfers and deficits. Our model also allows us to endogenise output in a very general way. We find that political deficit and transfer cycles increase with the magnitude of political rents, the number of uninformed voters, the overall expansionary effect of deficit finance on output, and the degree of slack in the economy (anticyclical behaviour of polciymaker). All results are quite intuitive. To our knowledge of the literature, the latter two findings on the interdependence between endogenous output and optimal politically motivated deficit finance have not yet been studied empirically – or theoretically.

Our paper suggests at least two possible extensions. First, the interdependence between output and politically motivated deficit finance could be empirically investigated. Second, our behavioural assumption about the uninformed voters could be varied, especially in light of the endogenous output extension. What happens, if uninformed voters do not fully understand the effect of deficit finance on output? What happens, if informed and uninformed voters have different expectations about future output shocks?

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