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# Political Transfer Cycles - How robust are they?

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# Political Transfer Cycles - How robust are they?

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## **Abstract**

This paper investigates the robustness of political budget cycles in a stripped-down setting with endogenous output and endogenous rent-seeking. No matter if or how government manipulations affect aggregate demand, equilibrium transfer and deficit cycles emerge. The government can always improve reelection chances by increasing debt-financed transfers before elections and cutting transfers to repay the deficit after elections. As for endogenous rent-seeking, deficit cycles are still robust, but transfer payments to voters are substituted by socially costly expropriation payments.

**JEL classification:** D72, E32, E62, H62.

**Keywords:** political business cycles, deficit bias, fiscal policy, asymmetric information, rent-seeking, robustness.

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# 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. There is now an increased recognition that monetary policy is not the main tool of electioneering.<sup>1</sup> The rejection of a monetary-induced 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 deficit 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.<sup>2</sup>

The groundwork for a theory of the political *budget* cycle was laid by Rogoff (1990). In his paper, incumbents use debt-financed public goods to signal their competence and increase their reelection prospects. In that paper as well as more recent contributions stressing the key role of fiscal policy such as Shi and Svensson (2006) there are typically at least two unresolved problems. First, policymakers are modeled to receive a rent, but cannot affect its magnitude, even if developing countries are the main target of the investigation. Second, output is kept exogenous and feedback effects are ignored. Only Drazen (2001) allows a feedback effect of the budget cycle onto output through rules-based monetary policy in what he calls an active fiscal, passive monetary policy (AFPM) model.

This paper investigates the robustness of equilibrium transfer and deficit cycles in a stripped-down political budget cycle setting with endogenous output and endogenous rent-seeking.

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<sup>1</sup> Drazen (2001) 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.

<sup>2</sup> Evidence of opportunistic cycles in budgets and transfers is reported by Block (2002), Schuknecht (1996, 2000), Shi and Svensson (2006), or Vergne (2009).

The existence of uninformed voters tempts the incumbent government to try to appear more competent than it is by providing individuals with large transfers, the level of which can be observed by everybody. Even though some voters do not have full information, they anticipate (as in Shi and Svensson, 2006) that the government tries to suggest higher competence by increasing the level of debt-financed transfer payments. Based on our model, we can show that an increase in the share of uninformed voters and an increase in politicians' political rents raises the equilibrium level of transfers and deficits.<sup>3</sup> Transfer and deficit cycles emerge.

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 assume that production is demand-determined in the short run. We consider the most general multiplier effects of fiscal policy which could be both expansionary and/or contractionary before and after elections, thereby allowing Keynesian, Classical or New Keynesian output effects of government manipulations. Qualitatively, we obtain the same results as before (for exogenous output), but they differ quantitatively. If, for instance, 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.

In a second extension, we study the impact of giving the government another instrument. In addition to transfer manipulations, the incumbent can choose its most desired level of the rent (up to a maximum). Instead of the original model's ego rent (from being in office) which is costless for society, the extension captures expropriation by the government, i.e. the government's power to enrich itself to the detriment of society. Rent-seeking has a direct beneficial effect for the government, but, at the same time, it is also costly for the

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<sup>3</sup> This result parallels the findings of the Shi and Svensson, who focus, however, on deficits and public goods provision.

government because rents are (like transfers) also debt-financed, but does (unlike transfers) not contribute to appearing more competent. We find that the government will always choose the maximally possible rent. Deficit cycles are amplified, because the deficit must now cover both the rent (which benefits the incumbent directly) as well as transfers to the public (which improve the incumbents re-election chances).

The results of both extensions are not obvious, but quite intuitive. To our knowledge, there is no empirical study complementing our theoretical findings. Nor has the interdependence between budget cycles and endogenous output or rent-seeking been studied rigorously so far. Nonetheless, 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 papers 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 different types of private agents, which affects the public's perception 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.

The structure of this paper emphasises the differences to both Rogoff (1990) and Shi and Svensson (2006) in three other respect. First, it responds to the empirical finding that it is mainly transfers that are increased in pre-election years. The basic transfer model is presented in Section 2 and the solution is outlined in Section 3. We show that transfers depend on the share of uninformed voters and on the magnitude of the rent the incumbent receives from staying in power. We obtain deficit and transfer cycles, whereas Rogoff (1990) and Shi and Svensson (2006) model deficit and public goods provision. Second, we capture

the interdependence between output and rational political manipulations of deficits and transfers by policymakers in Section 4. In contrast, output is exogenous and constant both in Rogoff (1990) and in Shi and Svensson (2006). Third, we allow the government to endogenously determine its desired amount of the rent in Section 5. Again, this is constant in Rogoff (1990) and in Shi and Svensson (2006). Section 6 concludes with a summary of the findings and suggestions for future research.

## 2 A Political Transfer Model

In this model, every second period an incumbent politician and a challenger representing different parties run for office. Politicians' motivation is purely opportunistic. Nonetheless, voters' utility does not hinge on economic considerations alone, but also on a more or less strong personal predisposition or sympathy for one of the candidates.<sup>4</sup> The utility function for any voter  $i$  reflects both economic and non-economic components:

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

The economic component  $c_s$  (consumption) and the sympathy component  $\theta^i z_s$  are additively-separable with relative weight  $\alpha$  in each period. Discounting between periods could be added, but does not contribute to substance nor exposition. Utility derived from sympathy is constrained to  $\theta^i z_s \in [-\frac{1}{2}, \frac{1}{2}]$  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  $\theta^i$  is uniformly distributed over the interval  $[-1, 1]$ .<sup>5</sup> 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

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<sup>4</sup> 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.

<sup>5</sup> 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 ( $z_i = \frac{1}{2}$ ).

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.<sup>6</sup> 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:

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

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

$$c_t = y_t + t_t. \quad (3)$$

The government budget constraint is

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

where  $D$  measures deficit,  $R$  depicts repayment, and  $\eta$  is the incumbent's competence. Transfers are determined by the policymaker in power. They are intertemporal transfers, not income redistribution.<sup>7</sup> They allow more government subsidies or benefits. Transfers are debt-financed; they depend on deficit minus repayment. (Repayment function  $R$  is assumed to be positively sloping and convex with  $R(0) = 0$ .) However, the total amount of

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<sup>6</sup> This is explained at the end of this section. Confer the paragraph on the timing of events on page 6.

<sup>7</sup> Instead of equations (3) and (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? An 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.

transfers also depends on incumbent politician  $j$ 's competence in period  $t$ ,  $\eta_t^j$ .<sup>8</sup> Competence  $\eta_t^j$  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:<sup>9</sup>

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

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 transfer level  $t_t$  and past skills shock  $\mu_{t-1}^j$ . Only informed voters observe  $D_t$ , uninformed voters do not. This assumption simplifies the reality of hidden accounts and disguised information about government finances.<sup>10</sup> Informed voters can deduce current skills  $\mu_t^j$ , 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

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<sup>8</sup> 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  $\eta_t^j$  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.

<sup>9</sup> Limited persistence is a compromise. It allows some persistence while acknowledging that competence also changes over time as new tasks for politicians emerge. For persistence longer than 1 period, the model would not be easily solvable. 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 6.

<sup>10</sup> *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.

period  $t + 1$ , the winner (incumbent or challenger) takes office. Voters are no longer relevant for policymakers' decision making because they cannot vote in period  $t + 1$ . Politicians want to repay the previous period deficit because the deficit is costly<sup>11</sup> and voters cannot sanction the policymaker for reducing transfers, i.e. effectively levying additional taxes, to finance deficit repayment. Given that voters are only concerned about politicians competence after the election it does not matter that 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 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

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

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<sup>11</sup> 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.

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

$$E_t[c_{t+1}^a] = E_t[y_{t+1}] + E_t[t_{t+1}^a]; \quad E_t[c_{t+1}^b] = E_t[y_{t+1}] + E_t[t_{t+1}^b]; \quad (7)$$

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

Period  $t + 1$  government budget constraint (8) says that the period  $t$  deficit must be repaid in period  $t + 1$ .<sup>12</sup> 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  $t$ .

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

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

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  $a$ :

$$E_t[\mu_t^a] > \alpha\theta^i. \quad (11)$$

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

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

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<sup>12</sup> 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 6.

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

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

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

$$t_t = D_t + \eta_t \quad (14)$$

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 deficit in off-election period  $t - 1$  there is no repayment in election period  $t$ . Equation (14) can be rewritten as follows:

$$\begin{aligned} \eta_t &= t_t - D_t \\ E_t^{inf}[\mu_t^a] = \mu_t^a &= t_t - D_t - \mu_{t-1}^a \end{aligned} \quad (15)$$

The point is that informed voters can determine  $E_t^{inf}[\mu_t^a]$  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,  $\widehat{D}_t$ :

$$\widehat{\mu}_t^a = t_t - \widehat{D}_t - \mu_{t-1}^a \quad (16)$$

$$\text{or} \quad \widehat{D}_t = t_t - \widehat{\mu}_t^a - \mu_{t-1}^a$$

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

$$E_t^{uninf}[\mu_t^a] = \mu_t^a + D_t - \widehat{D}_t \quad (18)$$

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

$$\begin{aligned} & \text{Prob} \left\{ \sigma \left[ \frac{\mu_t^a}{2\alpha} + \frac{1}{2} \right] + (1 - \sigma) \left[ \frac{\mu_t^a + D_t - \widehat{D}_t}{2\alpha} + \frac{1}{2} \right] \geq \frac{1}{2} \right\} \\ = & \text{Prob} \left\{ \frac{\mu_t^a}{2\alpha} + (1 - \sigma) \frac{D_t - \widehat{D}_t}{2\alpha} + \frac{1}{2} \geq \frac{1}{2} \right\} \\ = & \text{Prob} \left\{ \mu_t^a \geq (1 - \sigma)(\widehat{D}_t - D_t) \right\} \end{aligned} \quad (19)$$

$$= 1 - F[(1 - \sigma)(\widehat{D}_t - D_t)], \quad (20)$$

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:

$$\begin{aligned} \max_{D_t} \quad & E_t \{ y_t + D_t + \eta_t^a + X \} \\ & + E_t \left\{ \underbrace{[1 - F[(1 - \sigma)(\widehat{D}_t - D_t)]]}_{\text{prob. incumbent wins}} [y_{t+1} - R(D_t) + \eta_{t+1}^a + X] \right\} \\ & + E_t \left\{ \underbrace{[F[(1 - \sigma)(\widehat{D}_t - D_t)]]}_{\text{prob. incumbent loses}} [y_{t+1} - R(D_t) + \eta_{t+1}^b] \right\} \end{aligned} \quad (21)$$

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:

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

$$\begin{aligned}
& +\bar{y} - R(D_t) \\
& +[1 - F[(1 - \sigma)(\widehat{D}_t - D_t)]]X
\end{aligned} \tag{22}$$

Differentiation with respect to  $D_t$  produces the following FOC:

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

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:

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

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  $\sigma$ :

$$\frac{dD^*}{dX} > 0 \qquad \frac{dD^*}{d\sigma} < 0 \tag{25}$$

Higher political rents and a larger share of 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 deficit 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 and output. We postulate a very general formulation, which allows a

debt-financed fiscal policy to produce both expansionary and/or contractionary effects on aggregate demand. 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. We could even distinguish different worlds we live in:  $b > 0$  could be interpreted as Keynesian,  $b \leq 0$  as Classical, and  $b > 0$  first, but later  $b < 0$  possibly as New Keynesian. If we assumed a Keynesian world, for instance, there would be a positive demand effect in the period when the deficit occurs ( $b > 0$  and  $t_t > 0$ ), but some negative effect in the repayment period ( $b > 0$  and  $t_t < 0$ ). Inserting equations (14) and (8), respectively, we obtain the following output equations (with typically  $b_1 \neq b_2$ ):

$$\begin{aligned} y_t &= \bar{y} + b_1(D_t + \eta_t) \\ y_{t+1} &= \bar{y} + b_2(-R(D_t) + \eta_{t+1}) \end{aligned} \tag{27}$$

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:

$$\begin{aligned} \max_{D_t} \quad & \bar{y} + (1 + b_1)(D_t + \mu_t^a) + X \\ & + \bar{y} - (1 + b_2)R(D_t) \\ & + [1 - F[(1 - \sigma)(\widehat{D}_t - D_t)]]X \end{aligned} \tag{28}$$

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  $b_2$ :

$$\frac{dD^*}{db_1} > 0 \qquad \frac{dD^*}{db_2} < 0 \qquad (30)$$

The first inequality says that the government will optimally choose to increase the level of deficit, if the expansionary effect of deficit finance on current output (measured by  $b_1$ ) increases (or the contractionary effect decreases). Increasing the marginal benefit of running a deficit in the first period raises the incentive to electioneer. The second result concerning  $b_2$  is the analogue. If the marginal cost of deficit repayment on future output is raised (or its marginal benefit reduced), a politically motivated government will borrow less. In other words, if deficit finance becomes more contractionary, be it in  $t$  or  $t + 1$ , the deficit and transfer cycle will be less pronounced. However, if the deficit finance tool becomes more effective, it is optimal to use it more. We can also compare our results to those obtained for exogenous output. If deficit finance has, on the whole, a positive effect on output, the government will exploit the situation and exacerbate the cycle. Overall, deficit and transfer cycle persist, no matter which world (Keynesian, Classical or New Keynesian) we live in.

## 5 Endogenising Rent-Seeking

The discussion of endogenised rent-seeking proceeds in three steps. First, we transform the ego rent from being in office, which is costless for society, into a rent which is financed by society. There is a conceptual difference between an additional benefit from an ego rent and from rent-seeking in terms of expropriation from society, although the rent is still exogenous and, thus, the marginal conditions of Section 3 (and 4) remain unchanged. Under rent-seeking, however, the deficit is used both for paying the rent (to benefit the incumbent directly) as well as for financing the transfers to the public (to improve the incumbents

re-election chances). Second, we endogenise rent-seeking. Doing so requires assumptions about the maximum levels and the information dispersion of rent-seeking. Third, we can show on this basis that incumbents will always exploit society to the utmost. Therefore, endogenous rent-seeking does not help reduce the deficit cycle.

As for step 1, we follow the logic of the Political Transfer Model of Section 2 as well as Shi and Svensson (2006): if the (still exogenous) rent  $X$  is to be financed by society, each individual must contribute an equal share.

$$X = n\bar{r}, \tag{31}$$

where  $n$  is the number of agents in society (including the incumbent) and  $\bar{r}$  depicts the individual share. The government budget constraint (per capita) becomes

$$t_t = D_t - R(D_{t-1}) + \eta_t^j - \bar{r}. \tag{32}$$

Now, the net deficit (modulo competence) is used to finance both transfers and the rent. The incumbent's maximisation problem changes only slightly:

$$\begin{aligned} \max_{D_t} \quad & E_t\{y_t + D_t + \eta_t^a + (n-1)\bar{r}\} \\ & + E_t\left\{\underbrace{[1 - F[(1-\sigma)(\widehat{D}_t - D_t)]]}_{\text{prob. incumbent wins}} [y_{t+1} - R(D_t) + \eta_{t+1}^a + (n-1)\bar{r}]\right\} \\ & + E_t\left\{\underbrace{[F[(1-\sigma)(\widehat{D}_t - D_t)]]}_{\text{prob. incumbent loses}} [y_{t+1} - R(D_t) + \eta_{t+1}^b - \bar{r}]\right\} \end{aligned} \tag{33}$$

The incumbent has to pay her share of the rent, but receives the rent contributions from all members of society, if in power. Modifying the exogenous components of the model does not change the FOC or the perturbation results of Section 3 (and 4), but does affect the magnitude of the deficit, because it is also used for providing the incumbent's rent.

In step 2, consider the case of an endogenous rent. The government can now use rent-seeking as an additional instrument, but only up to a maximum level  $\bar{r}$  in each period. We know from our discussion of the timing of events beginning on page 6 that the incumbent will expropriate as much as possible in the off-election period. So we can limit our analysis to endogenous rent-seeking in the election period. It remains to clarify what private agents know about rent-seeking. To focus on the effect of endogenous rent-seeking as such we assume that informed agents can also observe the government's rent-seeking activities, but uninformed agents cannot.<sup>13</sup> As a result, the probability that incumbent  $a$  receives 50% of the votes in period  $t$  becomes

$$\begin{aligned} & \text{Prob} \left\{ \sigma \left[ \frac{\mu_t^a}{2\alpha} + \frac{1}{2} \right] + (1 - \sigma) \left[ \frac{\mu_t^a + D_t - \widehat{D}_t + \widehat{r}_t - r_t}{2\alpha} + \frac{1}{2} \right] \geq \frac{1}{2} \right\} \\ & = 1 - F[(1 - \sigma)(\widehat{D}_t - D_t + r_t - \widehat{r}_t)]. \end{aligned} \quad (34)$$

The maximisation problem can now be summarised as:

$$\begin{aligned} \max_{D_t, r_t} \quad & y_t + D_t + \mu_{t-1}^a + (n - 1)r_t \\ & + y_{t+1} - R(D_t) - \bar{r} \\ & + [1 - F[(1 - \sigma)(\widehat{D}_t - D_t + r_t - \widehat{r}_t)]]n\bar{r} \\ \text{s.t.} \quad & r_t \leq \bar{r}. \end{aligned} \quad (35)$$

In step 3, we can analyse the problem without formally deriving a solution. We can proof by contradiction that the government will always choose maximal expropriation. Let us start by assuming (for the moment) that the incumbent does actually choose the maximum

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<sup>13</sup> We could also assume that rent-seeking can be observed by, for instance, fewer people than the deficit. Theoretically, it would be possible to obtain an interior solution, thereby disputing the result of this paper. However, the share of voters who are uninformed about rent-seeking would have to be much larger than the share of voters who are uninformed about the deficit. Why this is so becomes obvious from the ensuing analysis.

rent for election period  $t$ . In order to increase the level of transfers, would she prefer to reduce the rent or increase the deficit by an equal amount? Both would have the same effect on the critical value of density function  $F$  and thus on the probability of receiving  $n\bar{r}$  in off-election period  $t + 1$ . In addition, the utility would change by  $D_t - R(D_t) < 0$  in case of an increase of the deficit, but decrease by  $(n - 1)r_t$ , i.e. much more, in case of a reduction of the rent. Therefore, the government would never choose to reduce the rent when the deficit instrument is also available. This means that we are back at the solution discussed in Section 3 (and 4). Marginal conditions and perturbation results are the same, but the deficit must be larger because both transfers and rents must now be financed.

## 6 Conclusion

This paper contributes to the theoretical political budget cycle literature. We acknowledge the empirical findings that political business cycles are mainly spurred by transfers and deficits. Our model confirms the existence of the budget cycle: transfer and deficit cycles are amplified with the magnitude of an ego rent and the share of uninformed voters. By endogenising output and rent-seeking we can extend this result. We find that political deficit and transfer cycles are amplified with an overall expansionary effect of deficit finance on output. However, the PBC always exists, no matter what the effect, i.e. irrespective to which world (Keynesian, Classical or New Keynesian) we live in. We also find that deficit cycles are augmented when the government can decide on the degree of rent-seeking. The government will always choose the maximally possible rent. The deficit must now cover both the rent (which benefits the incumbent directly) as well as the transfers to the public (which improve the incumbents re-election chances). Our results are not obvious, but quite intuitive. Nevertheless, to our knowledge, the interdependence between budget cycles and endogenous output or rent-seeking has not yet been studied rigorously.

Our paper suggests at least three possible extensions. First, the interdependence between

politically motivated deficit finance and output and/or rent-seeking could be empirically investigated. Second, we could think about relaxing Rogoff's (1990) fatalistic position, whereby rational voters should not let their expectations about postelection performance be influenced by preelection behaviour. In our context, this approach implies that voters accept maximal expropriation by the incumbent, because they are only interested in the policymaker's competence and its impact on future outcomes. Third, we could relax the assumption that uninformed voters form rational expectations as suggested by Shi and Svensson (2006) and also used in this paper. In that case, one has to make a behavioural assumption about perceived deficit as done in a similar model in Bohn (2009).

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