

Matsen, Egil; Thøgersen, Øystein

Working Paper

Habit formation, strategic extremism and debt policy

CESifo Working Paper, No. 2169

Provided in Cooperation with:

Ifo Institute – Leibniz Institute for Economic Research at the University of Munich

Suggested Citation: Matsen, Egil; Thøgersen, Øystein (2007) : Habit formation, strategic extremism and debt policy, CESifo Working Paper, No. 2169, Center for Economic Studies and ifo Institute (CESifo), Munich

This Version is available at:

<https://hdl.handle.net/10419/26213>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

HABIT FORMATION, STRATEGIC EXTREMISM AND DEBT POLICY

EGIL MATSEN
ØYSTEIN THØGERSEN

CESIFO WORKING PAPER NO. 2169
CATEGORY 1: PUBLIC FINANCE
DECEMBER 2007

An electronic version of the paper may be downloaded

- *from the SSRN website:* www.SSRN.com
- *from the RePEc website:* www.RePEc.org
- *from the CESifo website:* www.CESifo-group.org/wp

HABIT FORMATION, STRATEGIC EXTREMISM AND DEBT POLICY

Abstract

We suggest a probabilistic voting model where voters' preferences for alternative public goods display habit formation. Current policies determine habit levels and in turn the future preferences of the voters. This allows the incumbent to act strategically in order to influence the probability of re-election. Comparing to a benchmark case of a certain re-election, we demonstrate that the incumbent's optimal policy features both a more polarized allocation between the alternative public goods and a debt bias.

JEL Code: D72, D78, H62.

Keywords: budget deficits, voting, extremism, habit formation.

Egil Matsen
Department of Economics
NTNU
Dragvoll University Campus
building 7, level 5, room 7534
7491 Trondheim
Norway
egil.matsen@svt.ntnu.no

Øystein Thøgersen
Department of Economics
Norwegian School of Economics and
Business Administration
Helleveien 30
5045 Bergen
Norway
oystein.thogersen@nhh.no

11.12.2007

We appreciate valuable comments from Rune Jansen Hagen, Erling Holmøy and Ragnar Torvik. We are also grateful to seminar participants in Bergen, Garmisch and Zurich for remarks and valuable discussion. Financial support from the Research Council of Norway is gratefully acknowledged.

1. Introduction

A hundred days into George W. Bush's presidency, *The Economist* entitled its cover story "That shocking conservative". The story was about the common perception among political commentators and pundits of a president pushing a much more conservative agenda, on e.g. tax cuts, than his campaign platform had suggested.¹ Glaeser et al. (2005) provide more systematic evidence showing that politicians sometimes implement policies that are more extreme than their political platforms. They report that Democrats and Republicans in the US on the one hand have very similar, moderate platforms on tax policy. On the other hand evidence reveals rather big differences in mean tax rates between Democratic and Republican administrations.

Why would an elected politician want to pursue more extreme policies than his party platform suggests? One possibility is that party leaders have extreme preferences (Alesina, 1988) which in turn can lead to implementation of more extreme policies than indicated by the electoral platforms (Glaeser et al., 2005). While politicians' ideological preferences are important, we would still expect that the desire for re-election would moderate policies that seem extreme relative to voters' preferences.

This paper demonstrates that extreme policies in terms of a more polarized resource allocation may occur not because the incumbent has extreme preferences, but because it makes the incumbent's *desired future policy* appeal to a larger group of voters. More specifically, we suggest that voters' preferences are characterized by reference levels that are affected by current policies, and politicians can use this link strategically to influence the probability of re-election.

We consider a political framework where potential partisan governments disagree with respect to the composition of public spending as in Alesina and Tabellini (1990) (henceforth "AT") and Tabellini and Alesina (1990) (henceforth "TA"). Crucially, we suggest that voters' utility of a given level of spending on each public good depends not just on the current supply, but also on how that level compares to what they are used to, i.e. their habit level. Comparing to a benchmark case of a certain re-election, this gives the incumbent incentives to implement more polarized allocations. By supplying more today of his most preferred public good, the incumbent can push up voters' habit levels and correspondingly their future marginal utility of this good. This will increase the probability of re-election.

The assumption that preferences are characterized by reference dependence in the form of habit formation has been explored in many branches of economics recently. (Though, to our knowledge, this paper represents the first attempt in the field of political economy.) It is most common in studies of consumption; see Deaton (1992) for a survey.² It has more recently proved to be

¹ See *The Economist*, 28 April 2001, North America edition. Fiorina (1999) offers a more detailed discussion of how and why US politics has changed from being centrist during the 1950s and 60s to being increasingly polarized during the later decades.

² The general idea of habit formation in consumption seems to be formulated by James Duesenberry, see for example Duesenberry (1949). Other early contributions include Ryder and Heal (1973) and Easterlin (1974).

successful in stochastic, consumption-based analyses of asset prices, see for example Campbell and Cochrane (1999), and also in studies of growth (Carroll et al., 2000) and stabilization policy (Ljungqvist and Uhlig, 2000). Habit formation implies that the satisfaction an individual realizes from a given consumption level tends to depend more on the *change* in consumption (i.e. the deviation between actual consumption and a historically determined habit level) than on the level itself. This is in accordance with psychological research that suggests that individuals' satisfaction is determined by actual outcome relative to some reference level, see Fredrick and Loewenstein (1999) and Rabin (1998, 2002). As highlighted by Campbell and Cochrane (1999: 208): "Habit formation captures a fundamental feature of psychology: Repetition of a stimulus diminishes the perception of the stimulus and responses to it".

Traditionally, the assumption of habit formation has been related to individuals' private consumption. We will argue, however, that habit formation is equally important for any voter's preferences for most types of public goods. For example, habit formation seems crucial for voters' welfare assessments of the spending levels on essential public goods like schools and education, health services, roads and most types of infrastructure. Solnick and Hemenway (2005) report preliminary evidence in favor of reference dependence in the evaluation of public goods.³

Models of political behavior generally assume that voters' policy preferences are exogenous to actual policies.⁴ Recent evidence suggests, however, that there may be important feedback effects from economic policy to individual preferences. Alesina and Fuchs-Schündeln (2007) use the German reunification of 1990 as a "natural experiment" to test the relationship between political regime and individual preferences. They strongly conclude that there is a causal link from policies to preferences. Alesina and Fuchs-Schündeln identify the fact that people "get used to" certain policies as one of the reasons for this link. Our model takes this fact seriously in the sense that we model how current policies determine habits and the future preferences of the voters.

We are not the first to analyze how political extremism can appear for strategic (i.e. vote-maximizing) reasons. Glaeser et al. (2005) present a model where strategic extremism occurs because it energizes the incumbent's core constituents more than it energizes the opponent's supporters. Note, however, that they focus on extreme platforms rather than actual policies. Indeed, their model predicts that extremism in policies is due to extreme preferences of candidates, whereas platform extremism occurs for strategic reasons. Our analysis shows that extreme actual policies also can occur for strategic reasons. We share this feature with Glazer et al. (1998). They explore a model where an

³ Note that Solnick and Hemenway analyze positional concerns as determinants of reference levels, analogous to external habit formation in some other contributions to this literature.

⁴ An exception is retrospective voting models where voters punish the incumbent by voting against him if he acted against their interest when in office. In contrast to this backward-looking model, voters are fully forward-looking in our set-up. We also note that models of directional voting (see Rabinowitz and Macdonald, 1989) give the status quo a central role in voting behavior. As in our analysis, this model incorporates a reference point in decision making. Unlike in our model, however, the reference point gives voters incentives to vote strategically; our reference points give politicians incentives to act strategically.

incumbent has incentives to implement extreme policies because it creates a cost to voters of changing powers. Their results hinge critically on the assumptions that there is a fixed cost associated with a policy change and that politicians are (partly) office motivated. This contrast our model where parties are outcome oriented and the election winner can implement preferred policies without any frictions.

Our paper is closely related to the strategic debt literature initiated by Aghion and Bolton (1990), Persson and Svensson (1989), AT (1990) and TA (1990).⁵ Building on the models of AT and (particularly) TA, we explore a model where different potential governments disagree about the composition of public goods provision.⁶ As extensions, we include probabilistic voting and habit formation in voters' preferences for public goods. It turns out that the extreme resource allocation of the incumbent is accompanied by a strategic debt bias. This debt bias is caused exclusively by the incumbent's attempt to influence the probability of re-election. As explained in more detail below, it complements the strategic debt effects identified by AT and TA.

The next section of this paper presents our model, and briefly discusses the benchmark case where the initial government is certain about re-election. Section 3 considers equilibrium policies when the incumbent acts strategically in the face of uncertainty about re-election. Section 4 offers some final remarks.

2. An intertemporal model with probabilistic voting

Adopting the probabilistic voting approach of Persson and Tabellini (2000, section 13.3), we consider a political environment consisting of two competing political parties ($J = D, R$) with two associated natural constituencies in the form of identically large groups of voters ($j = d, r$). The two parties are outcome oriented and, following AT (1990) and TA (1990), they disagree about the composition of public spending. As TA, we consider a two-period framework. For simplicity, we disregard discounting of utility and assume that the real interest rate is zero.

Parties

Party J is characterized by the period-utility function

$$(1) \quad u_t^J = \alpha^J \log f_t + (1 - \alpha^J) \log g_t,$$

where f_t and g_t are the spending levels on the two public goods in period t , $t = 1, 2$. The parameter α^J , $0 \leq \alpha^J \leq 1$, captures the preferences of party J for the composition of the goods. Party R attaches

⁵ This strategic debt literature is part of the broader literature on how an incumbent can influence potential successors by altering alternative state variables. For example, Cukierman et al. (1992) apply this idea to taxation while Glazer (1989) considers the choice of public investments in this context.

⁶ The alternative approach taken by Persson and Svensson (1989) is to assume that governments disagree about the public spending level vs. private consumption.

a higher weight to the utility of f_t than party D , i.e. $\alpha^R > \alpha^D$ and we assume, as Persson and Tabellini, that $\alpha^R = 1 - \alpha^D > \frac{1}{2}$. For concreteness, we assume that the period 1 incumbent is a R -government. Because the model is symmetric in every aspect, all results generalize directly to the case of an incumbent D -government.

The government in each period is endowed with one unit of output and has access to a perfect global financial market. Thus, the resource constraints are given by

$$(2a) \quad f_1 + g_1 = 1 + b$$

and

$$(2b) \quad f_2 + g_2 = 1 - b,$$

where b is public debt.

In period 1 the incumbent R -government faces an endogenous probability, Π , of not being re-elected for period 2. If re-elected, the R -government sets its preferred policy, $f_2 = f_2^R$ and $g_2 = g_2^R$. If replaced, the policy of the succeeding D -government must be accepted, $f_2 = f_2^D$ and $g_2 = g_2^D$. Thus, the R -incumbent determines optimal policy in terms of f_1 , g_1 and, consequently, b , by the maximization of

$$(3) \quad u_1^R(f_1, g_1) + \Pi u_2^R(f_2^D, g_2^D) + (1 - \Pi)u_2^R(f_2^R, g_2^R),$$

subject to (1), (2a) and (2b) and given perfect knowledge about i) how Π depends on the chosen policy and ii) how the alternative D -government will behave in period 2 if elected. Our modeling of the voters' preferences will imply that Π is a function of both the intra-period split between f_1 and g_1 as well as the intertemporal distribution of resources (b).

Analyzing how the incumbent will utilize the link between policy-choices and Π , we will compare the outcome with a benchmark case of a certain re-election for the R -government, i.e. $\Pi = 0$. It follows from (1), (2a), (2b) and (3), that our benchmark is given by

$$(4) \quad f_t = \alpha^R, \quad g_t = (1 - \alpha^R) \quad \text{and} \quad b = 0, \quad \text{for } t = 1, 2.$$

Voters

The utility of voter i in group j is given by

$$(5) \quad u_1^j + u_2^j + (\sigma^{ij} + \delta)K^D,$$

where u_t^j is the period t utility of the provided package of public spending.⁷ The dummy variable K^D is one in the case of party D holding office in period 2 and zero in the case of party R . Moreover, σ^{ij} is an idiosyncratic bias in group j for party D , reflecting non-economic ideological factors, and δ

⁷ Following TA (1990), we abstract from private consumption decisions.

is an aggregate popularity shock. The distributions of σ^{ij} and δ are uniform with zero means and densities that are similar across the parties and equal to respectively ϕ and ψ .

The period-utility functions of the voters in group j are given by

$$(6) \quad u_t^j = \alpha^j \log F_t + (1 - \alpha^j) \log G_t \quad (t = 1, 2),$$

where F_t and G_t are the *surplus* spending levels on the two public goods, reflecting our specification of habit formation in the voters' preferences for public goods. We have that

$$(7a) \quad F_t = f_t - \gamma f_{t-1},$$

and

$$(7b) \quad G_t = g_t - \gamma g_{t-1},$$

where γ , $0 \leq \gamma < 1$, indicates the strength of the habit formation mechanism (and $\gamma = 0$ implies additive separable preferences). The magnitudes of f_0 and g_0 are given by history. We assume that the relevant values of γ ensure $F_t > 0$ and $G_t > 0$.

Capturing that group j is the natural constituency of party J , we assume that $\alpha^R = \alpha^r$ and $\alpha^D = \alpha^d$. Still, the existence of ideological concerns and popularity shocks, as introduced in (5), and habit formation may all imply that segments of the voters may take voting decisions that are not in accordance with their constituency.

A crucial feature of the model is the fact that voters' preferences are characterized by habit formation, while this is not the case for the preferences of the parties. This reflects two priorities. First, we wish in particular to highlight that voters' preferences are endogenously determined by policies. This is modeled by a mechanism that is more transparent if the parties' preferences do not change in response to the implemented policies. Second, studies of party manifestos suggest that political parties' policy preferences are relatively stable over time. Using post WWII time series data for 25 democracies, Budge and Klingemann (2001) report that - while there are some changes in party positions over time - estimated party preferences within individual countries do generally not leapfrog or overlap. Hence, it seems reasonable to assume that political parties to a large extent represent basic ideas, and implied views about resource allocation, that remain more stable over time than the preferences of large segments of the voters.

3. The political equilibrium

The timing of the political decisions is as follows: In period 1 the R -incumbent sets its preferred policy in terms of f_1 , g_1 and b . There is no room for policy commitment. An election is held at the start of

period 2. The winning party then sets period 2 policy in terms of f_2 and g_2 . As usual, we solve the model backwards.

Post election policy

Assume that party J wins the election. The chosen period 2 policy is then determined by the maximization of u_2^J , see (1), subject to (2b) when b is inherited from period 1. This yields

$$(8a) \quad f_2^J(b) = \alpha^J(1-b)$$

and

$$(8b) \quad g_2^J(b) = (1-\alpha^J)(1-b).$$

Utilizing the period 1 budget constraint, (2a), it follows from (7a), (7b), (8a) and (8b) that the realized period 2 surplus spending levels, $F_2 = F_2^J$ and $G_2 = G_2^J$, can be written as (reaction-) functions of f_1 and g_1 :

$$(9a) \quad F_2^J(f_1, g_1) = \alpha^J(2 - f_1 - g_1) - \gamma f_1,$$

$$(9b) \quad G_2^J(f_1, g_1) = (1 - \alpha^J)(2 - f_1 - g_1) - \gamma g_1.$$

An increase in the period 1 spending on one of the goods, say f_1 , has two distinct effects on the period 2 surplus spending levels. The direct ‘‘habit effect’’ lowers the period 2 surplus spending on the same good through a higher habit level, i.e. the effect of f_1 on the last term on the RHS of (9a). In addition, there is a ‘‘debt effect’’ that lowers both surplus spending levels, i.e. the first term on the RHS of both (9a) and (9b).

Voting decisions

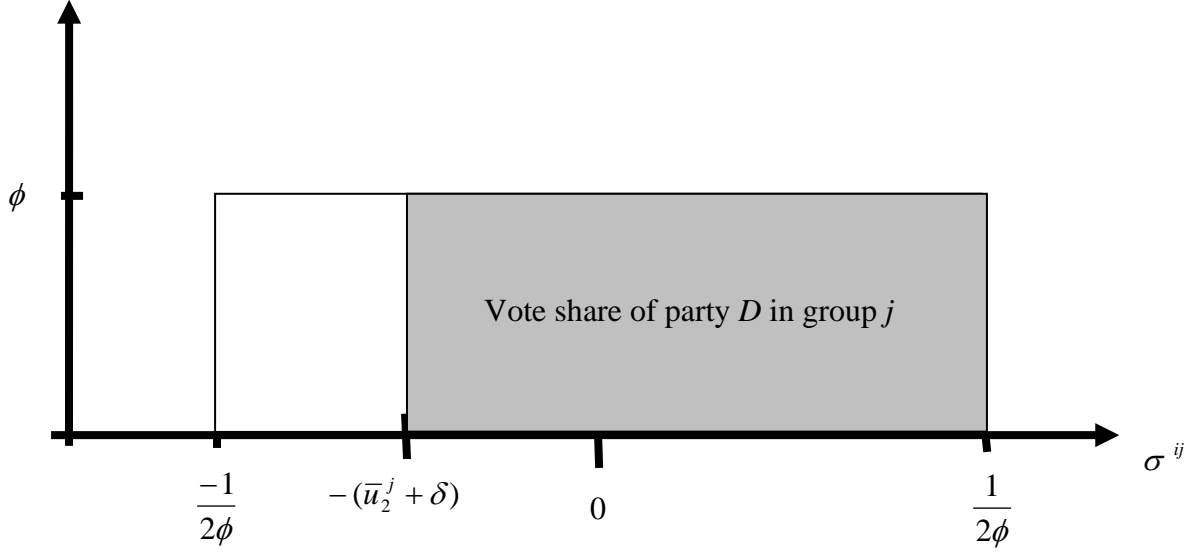
Turning to voting decisions, we define \bar{u}_2^j as the difference in period 2 utility for group j if party D rather than party R wins the election. It follows from (6) that

$$(10) \quad \bar{u}_2^j = \alpha^j(\log F_2^D - \log F_2^R) + (1 - \alpha^j)(\log G_2^D - \log G_2^R).$$

Being perfectly informed about the intensions of the alternative governments, voter i from group j will choose to vote for party D if $\sigma^{ij} > -(\bar{u}_2^j + \delta)$, see (5). Normalizing the size of each of the two groups to $\frac{1}{2}$, it follows (as seen by the illustration in Figure 1) that the number of voters for party D is

$$(11) \quad N^D = \frac{1}{2} \left(\frac{1}{2} + (\bar{u}_2^d + \delta)\phi \right) + \frac{1}{2} \left(\frac{1}{2} + (\bar{u}_2^r + \delta)\phi \right) = \frac{1}{2} + \frac{1}{2} (\bar{u}_2^d + \bar{u}_2^r)\phi + \delta\phi.$$

Figure 1: Vote share of party D in group $j, j = d, r$



We have that $\Pi(f_1, g_1) = \text{Prob}(N^D > \frac{1}{2})$. Recalling that the popularity shock, δ , is uniformly distributed with a zero mean and a density equal to ψ , it follows from (11) that

$$(12) \quad \Pi(f_1, g_1) = \frac{1}{2} + \psi \frac{1}{2} (\bar{u}_2^d + \bar{u}_2^r),$$

see Figure 2. Consequently, in order to investigate how the period 1 policy influences the probability of re-election, we have to consider the derivatives:

$$(13a) \quad \frac{d\Pi}{df_1} = \frac{1}{2} \psi \left(\frac{d\bar{u}_2^d}{df_1} + \frac{d\bar{u}_2^r}{df_1} \right),$$

$$(13b) \quad \frac{d\Pi}{dg_1} = \frac{1}{2} \psi \left(\frac{d\bar{u}_2^d}{dg_1} + \frac{d\bar{u}_2^r}{dg_1} \right).$$

From (9a), (9b), (10) and the assumption that $\alpha^R = 1 - \alpha^D$, we derive

$$(14a) \quad \frac{d\bar{u}_2^d}{df_1} + \frac{d\bar{u}_2^r}{df_1} = \gamma \left(\frac{1}{F_2^R} - \frac{1}{F_2^D} \right) - \alpha^D \left(\frac{1}{F_2^D} - \frac{1}{G_2^R} \right) - (1 - \alpha^D) \left(\frac{1}{G_2^D} - \frac{1}{F_2^R} \right),$$

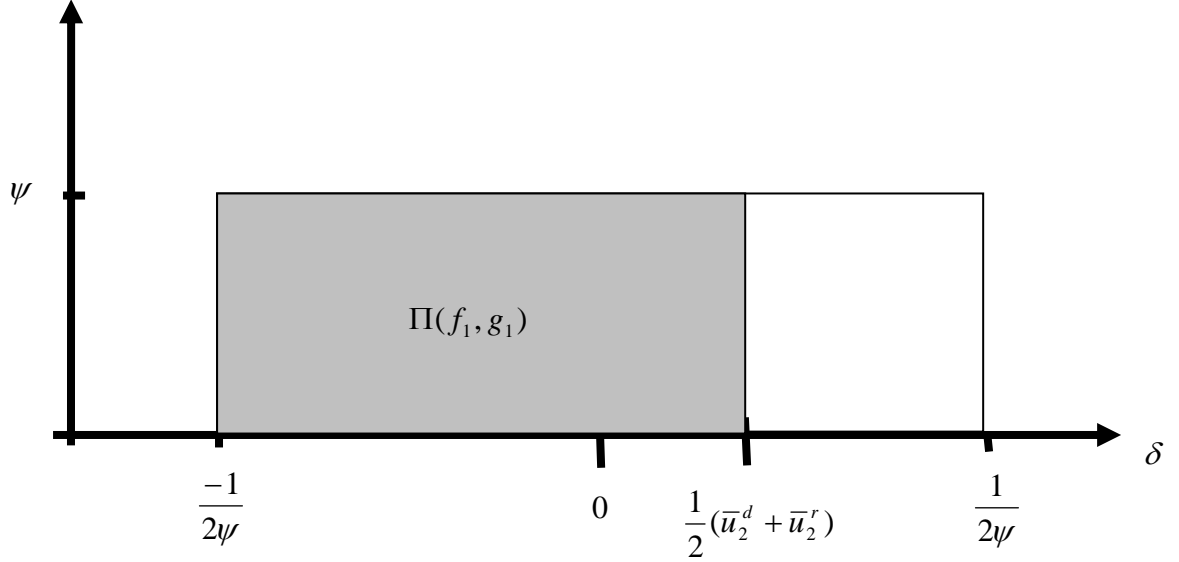
where the first term on the RHS captures the habit effect as defined above and the two remaining terms capture the debt effect. Using (9a) and (9b), we collect the last two terms and rewrite (14a):

$$(14b) \quad \frac{d\bar{u}_2^d}{df_1} + \frac{d\bar{u}_2^r}{df_1} = \gamma \left(\frac{1}{F_2^R} - \frac{1}{F_2^D} \right) + \gamma (f_1 - g_1) \left[\frac{1 - \alpha^D}{F_2^R G_2^D} - \frac{\alpha^D}{F_2^D G_2^R} \right].$$

Because $\alpha^R > \alpha^D$ and, accordingly, $F_2^R > F_2^D$, the habit effect is negative. This reflects that a higher habit level reduces voters' utility of given levels of f_2^j . Because $f_2^D < f_2^R$, the concavity of the

utility function implies that the drop in all voters' utility is larger in the case of a D -government than for a R -government.

Figure 2: The probability that party D wins the election



Noting that the term in brackets in the last part of the RHS of (14b) is negative (as shown in the Appendix), we conclude that the debt effect has the opposite sign of $(f_1 - g_1)$. This reflects that a higher debt reduces both f_2^J and g_2^J , which lower voters' surplus spending levels disproportionately, depending on the magnitudes of the habit levels, γf_1 vs. γg_1 . If $f_1 > g_1$, the drop in F_2^J is more painful than the drop in G_2^J , implying that all voters' assessment of the political parties are tilted in the favour of the R -government that will ensure the smallest reduction in f_2 . Correspondingly, the case of $f_1 < g_1$ implies a debt effect that favors voters' assessment of the R -party. Summing up, it follows for $\gamma > 0$ that the expression in (14b) is strictly negative if $f_1 \geq g_1$ and ambiguous if $f_1 < g_1$.

The derivation of how $\bar{u}_2^d + \bar{u}_2^r$ responds to changes in g_1 is analogous. Using (9a), (9b) and (10), we derive

$$(15) \quad \frac{d\bar{u}_2^d}{dg_1} + \frac{d\bar{u}_2^r}{dg_1} = \gamma \left(\frac{1}{G_2^R} - \frac{1}{G_2^D} \right) + \gamma(f_1 - g_1) \left[\frac{1 - \alpha^D}{F_2^R G_2^D} - \frac{\alpha^D}{F_2^D G_2^R} \right].$$

The habit effect of a higher g_1 favors party D , i.e. the first term on the RHS is positive, while the debt effect also favors party D if $g_1 > f_1$. Provided that $\gamma > 0$, the expression in (16) is therefore strictly positive if $g_1 \geq f_1$ and ambiguous if $g_1 < f_1$.

Returning to the effects on the probability of re-election of changes in respectively f_1 and g_1 (including the induced debt effect), we observe from (13a) and (13b) that they are proportional to the derivatives in (14b) and (15). The effects are also proportional to the magnitude of the density ψ . As illustrated in Figure 2, this simply reflects that a higher ψ implies that a given change in $\bar{u}_2^d + \bar{u}_2^r$ will influence the voting behavior of a larger group of voters. Moreover, it follows from (14b) and (15) that the ability of the incumbent to use current policies to influence Π hinges on the habit formation mechanism, i.e. $\gamma > 0$.⁸ If $\gamma = 0$, our model simplifies to a log-utility version of the TA (1990) framework, which features an exogenous probability of re-election.

Equilibrium policy

Using (1), (8a), (8b), (2a) and the condition $\alpha^D = 1 - \alpha^R$, we rewrite the expected utility function of the R -incumbent, (3), as

$$(3b) \quad \alpha^R \log f_1 + (1 - \alpha^R) \log g_1 + \log(2 - f_1 - g_1) + A + B\Pi(f_1, g_1).$$

Here A and B are negative constants (recall that $\alpha^R > \alpha^D$),

$$(16) \quad A = \alpha^R \log \alpha^R + (1 - \alpha^R) \log(1 - \alpha^R) < 0,$$

$$(17) \quad B = (1 - 2\alpha^R)(\log \alpha^R - \log(1 - \alpha^R)) < 0.$$

Maximization of (3b) with respect to f_1 and g_1 yields the first-order conditions

$$(18a) \quad \frac{\alpha^R}{f_1} - \frac{1}{2 - f_1 - g_1} + B \frac{d\Pi}{df_1} = 0,$$

$$(18b) \quad \frac{1 - \alpha^R}{g_1} - \frac{1}{2 - f_1 - g_1} + B \frac{d\Pi}{dg_1} = 0.$$

It is useful first to consider the corner case of no habit formation mechanism, i.e. $\gamma = 0$, which implies that $\frac{d\Pi}{df_1} = 0$ and $\frac{d\Pi}{dg_1} = 0$. We then obtain $f_1 = \alpha^R$, $g_1 = (1 - \alpha^R)$ and, from (2a), $b = 0$. This is equivalent to the benchmark case of a certain re-election, see (4). The intuition follows from TA (1990). When Π is exogenous and less than one, the incumbent on the one hand benefits from increased debt because it provides more of the most preferred composition of public spending today and, as a consequence of less total future spending, it also “forces” the potential alternative government to set the composition of public spending in period 2 closer to the incumbent’s preferences. On the other hand, increased debt harms the incumbent because it implies a less smooth utility profile over time. The degree of concavity in the utility function determines whether a debt or

⁸ Comparing to the probabilistic voting framework of Persson and Tabellini (2000, section 13.3), we note that the ability of the incumbent to influence the probability of re-election in their model hinges completely on the assumption that the uniform distributions for σ^{iR} and σ^{iD} have different densities. By the assumption of a similar density ψ , this mechanism is deliberately disregarded in our model.

surplus bias is optimal on strategic grounds.⁹ It turns out that log utility is the borderline case where the two opposite effects exactly cancel out. In the context of the present paper that assumes log utility at the outset, this is a useful property because it allows us to focus exclusively on the strategic effects of current policies on Π .

From (18a) and (18b), we obtain

$$(19) \quad \frac{\alpha^R}{f_1} - \frac{1 - \alpha^R}{g_1} = B \left(\frac{d\Pi}{dg_1} - \frac{d\Pi}{df_1} \right).$$

Using (13a), (13b), (14b) and (15), it is straightforward to verify that

$$(20) \quad \left(\frac{d\Pi}{dg_1} - \frac{d\Pi}{df_1} \right) = \frac{1}{2} \psi \gamma \left[\left(\frac{1}{G_2^R} - \frac{1}{G_2^D} \right) - \left(\frac{1}{F_2^R} - \frac{1}{F_2^D} \right) \right] > 0 \text{ for } \gamma > 0.$$

Recalling that the constant B is strictly negative, see (17), we conclude from (19) that:

PROPOSITION 1: *When $\gamma > 0$, the period 1 R-incumbent sets f_1 and g_1 such that $\frac{f_1}{g_1} > \frac{\alpha^R}{1 - \alpha^R}$.*

Comparing to the benchmark case of a certain re-election (see (4)), or the case with an exogenous re-election probability ($\gamma = 0$), this proposition implies that the incumbent chooses a more polarized allocation between the two public goods in the sense that the magnitude of the gap $f_1 - g_1 > 0$ has increased. Thus, rather than to cater to the middle as predicted by a median voter model, the incumbent's political-strategic reasoning leads him to choose a more extreme intra-period distribution of the two public goods.

In order to consider debt policy, we note that the first-order conditions (18a) and (18b) imply

$$(21) \quad f_1 + g_1 = 1 + \frac{1}{2} (2 - f_1 - g_1) B \left[f_1 \frac{d\Pi}{df_1} + g_1 \frac{d\Pi}{dg_1} \right].$$

Because $B < 0$ and $(2 - f_1 - g_1) > 0$, it follows that $f_1 + g_1 > 1$ if the term in brackets on the RHS is strictly negative. As demonstrated in the Appendix, this condition is satisfied when $\gamma > 0$. Thus:

PROPOSITION 2: *Given $\gamma > 0$, $b > 0$.*

Moreover, from Proposition 1 and Proposition 2, we immediately obtain:

PROPOSITION 3: *Given $\gamma > 0$, the R-incumbent sets $f_1 > \alpha^R$.*

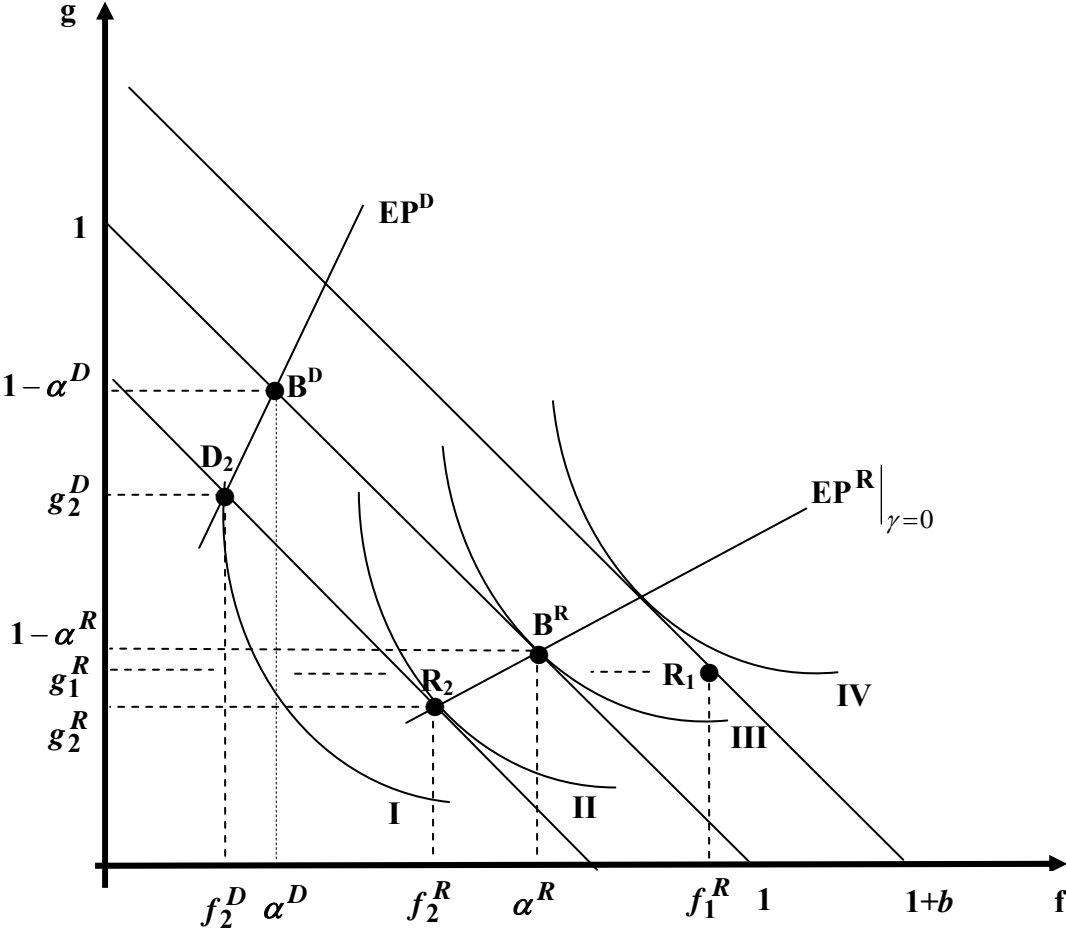
⁹ In the extreme case of completely opposite preferences, $\alpha^R = (1 - \alpha^D) = 1$, a debt bias is always optimal when $\Pi < 1$ because the incumbent will regard the alternative government's spending as pure waste.

Consequently, the incumbent’s choice of polarization in the sense of an increased gap between f_1 and g_1 involves an increase in the supply of his most preferred good - as compared to the case of a certain re-election.

Propositions 1 and 2 imply that the incumbent chooses to “pay” for the increased re-election probability by deviating from both his intra- and intertemporal first-best allocation of resources. We note that he could have increased the re-election probability by deviating only along the intra-period dimension. It turns out, however, that the cost to the incumbent of a given increase in Π is minimized when the distortion incurred due to polarization is smoothed with an intertemporal distortion caused by debt. Thus, debt allows the R -incumbent to increase the gap between f_1 and g_1 by means of a jump in f_1 (i.e. proposition 3) which is not fully compensated by a similar drop in g_1 .

Our analysis can be summarized by Figure 3.¹⁰ In this figure, the intra-period indifference

Figure 3: Optimal policies



¹⁰ Figure 3 is inspired by Figure 1 in TA (1990: p. 44).

curves of the R -incumbent are denoted I, II, III and IV. The period 2 expansion path of the potential D -successor is given by EP^D , while the expansion path of the R -government in the case of $\gamma = 0$ (i. e. when Π is exogenous) is given by $EP^R \Big|_{\gamma=0}$. The benchmark solution of a certain re-election for the R -incumbent is given by point B^R on the $b = 0$ budget line (in both periods). As explained above, the R -incumbent would also choose point B^R in period 1 when Π is exogenous and satisfies $0 < \Pi < 1$. Then the period 2 allocations would be either in point B^R if R wins the election or in point B^D if D wins.

Given that the R -incumbent can influence Π , the optimal period 1 allocation is given by R_1 . Comparing to B^R , the R -incumbent chooses $b > 0$, a larger gap between f_1 and g_1 and finally $f_1 > \alpha^R$. The R -incumbent now incurs costs in terms of both an inefficient intra-period allocation of resources in period 1 and an inefficient intertemporal resource allocation. These costs are worthwhile, however, because they are dominated by the increase in expected period 2 utility caused by a higher probability for the R_2 allocation in period 2 rather than the D_2 allocation.

4. Final remarks

This paper has put forward a probabilistic voting model where habit formation in the voters' preferences for alternative public goods implies a link from current policies in terms of decisions on the composition of public goods and debt to the probability for re-election. A forward-looking and output oriented incumbent that faces a probability of being replaced by an alternative government with different preferences for the composition of public goods, will act strategically and utilize this link in order to increase the probability of re-election. Comparing to either the benchmark case of a certain re-election or the case of an exogenous probability of re-election (due to $\gamma = 0$), we have shown that the incumbent chooses a larger initial period budget share for his most preferred public goods. This pushes up all voters' habit levels for this good. As a consequence, all voters' assessment of the incumbent's preferred future policy will be more favorable, leading in turn to a higher probability of re-election. Moreover, we have also demonstrated that the increased polarization in the resource allocation in the initial period is accompanied by a deficit bias.

Our predictions call for a search for empirical evidence. As mentioned in the introduction, Glaeser et al. (2005) report some striking observations of seemingly surprisingly polarized policies in the US. These observations refer to tax policies, however, and not to the composition of public goods. Moreover, there are plenty of observations of sustained public deficits in many major OECD

economies (see for example OECD, 2006) but as surveyed by Persson and Tabellini (2000, section 13.3.4) it has still proved hard to provide robust empirical evidence for suggested strategic motives.¹¹

With respect to AT (1990) and TA (1990), their prediction of an inverse relationship between the magnitude of the (exogenous) probability of re-election and the size of the deficit has been rejected by existing empirical studies. Our findings suggest a quite different relationship, however, i.e. a deficit and a polarized resource allocation are means used by the incumbent to increase the probability of re-election. Thus, we believe that careful empirical analyses of potential co-movements between these three variables are warranted. As a motivation for such an effort in the future, we note that our finding seems to be in the spirit of the theory of political business cycles and loosely consistent with the stylized fact (as presented by Persson and Tabellini, 2000, p: 393) that budget deficits tend to be larger during election years.

¹¹ One exception is a study by Petterson (2001). Using data for Swedish municipalities, he finds strong support for the strategic budget motive suggested by Persson and Svensson (1989).

Appendix

Last term on the RHS of (14b)

In order to determine the sign of the term in brackets on the RHS of (14b), we note that:

$$(A-1) \quad \left[\frac{1-\alpha^D}{F_2^R G_2^D} - \frac{\alpha^D}{F_2^D G_2^R} \right] = \frac{(1-\alpha^D)F_2^D G_2^R - \alpha^D F_2^R G_2^D}{F_2^D G_2^R F_2^R G_2^D}.$$

Substituting from (9a) and (9b) and using that $\alpha^R = 1 - \alpha^D$, we rewrite the numerator as

$$(A-2) \quad \begin{aligned} & \left(\alpha^D (1-\alpha^D)(2-f_1-g_1) - (1-\alpha^D)\gamma f_1 \right) \left(\alpha^D (2-f_1-g_1) - \gamma g_1 \right) \\ & - \left(\alpha^D (1-\alpha^D)(2-f_1-g_1) - \alpha^D \gamma f_1 \right) \left((1-\alpha^D)(2-f_1-g_1) - \gamma g_1 \right). \end{aligned}$$

Because $\alpha^D < \frac{1}{2}$ and $2-f_1-g_1 > 0$, the numerator must be strictly negative, implying that the terms in brackets on the RHS of (14b) must be strictly negative as well.

Proof of Proposition 2

Proposition 2 hinges on the condition that the term in brackets on RHS of (21) is strictly negative,

$$(A-2) \quad \left[f_1 \frac{d\Pi}{df_1} + g_1 \frac{d\Pi}{dg_1} \right] < 0.$$

Substituting from (13a), (13b), (14a) and (14b), and collecting terms, this condition can be written as

$$(A-3) \quad \frac{1}{2} \psi \left[\gamma (f_1 - g_1) \left(\frac{1-\alpha^D}{G_2^D F_2^R} - \frac{\alpha^D}{F_2^D G_2^R} \right) (f_1 + g_1) + \gamma f_1 \left(\frac{1}{F_2^R} - \frac{1}{F_2^D} \right) + \gamma g_1 \left(\frac{1}{G_2^R} - \frac{1}{G_2^D} \right) \right] < 0.$$

By Proposition 1 we have that $f_1 > g_1$. Using that the first part of this Appendix proves that the expression in (A-1) is strictly negative, it follows that a sufficient condition for (A-2) to hold is

$$(A-4) \quad f_1 \left(\frac{1}{F_2^R} - \frac{1}{F_2^D} \right) + g_1 \left(\frac{1}{G_2^R} - \frac{1}{G_2^D} \right) \leq 0.$$

Taking into account that $f_1 > g_1$, $F_2^R > F_2^D$ and $G_2^D > G_2^R$, (A-4) holds if

$$(A-5) \quad \left| \frac{1}{F_2^R} - \frac{1}{F_2^D} \right| \geq \left| \frac{1}{G_2^R} - \frac{1}{G_2^D} \right|,$$

which after straightforward manipulations can be written as

$$(A-6) \quad \frac{\alpha^R (1-b) - \gamma f_1}{\alpha^R (1-b) - \gamma g_1} \leq \frac{(1-\alpha^R)(1-b) - \gamma g_1}{(1-\alpha^R)(1-b) - \gamma f_1}.$$

This condition is obviously satisfied because $f_1 > g_1$. This implies that condition (A-2) and in turn Proposition 2 are satisfied as well.

References

- Aghion, P. and P. Bolton (1990): "Government domestic debt and the risk of default: A political-economic model of a strategic role of debt", in R. Dornbusch and M. Draghi (eds.), *Public Debt Management. Theory and History*, Cambridge, Cambridge University Press, 315-345.
- Alesina, A. (1988): "Credibility and policy convergence in a two-party system with rational voters", *American Economic Review*, 78, 796-805.
- Alesina, A. and G. Tabellini (1990): "A positive theory of fiscal deficits and government debt", *Review of Economic Studies*, 57, 403-414.
- Alesina, A. and N. Fuchs-Schündeln (2007): "Good bye Lenin (or not?): The effect of communism on people's preferences", *American Economic Review*, forthcoming.
- Budge, I. and H-D. Klingemann (2001): "Finally! Comparative over-time mapping of part policy movement", in I. Budge et al. (eds.), *Mapping Policy Preferences: Estimates for Parties, Electors, and Governments 1945-1988*, Oxford, Oxford University Press, 19-50.
- Campbell, J.Y. and J.H. Cochrane (1999): "By force of habit: A consumption-based explanation of Aggregate stock market behavior", *Journal of Political Economy*, 107, 205-251.
- Carroll, C.D., J. Overland and D.N. Weil (2000): "Saving and growth with habit formation", *American Economic Review*, 90, 341-355.
- Cukierman, A., S. Edwards and G. Tabellini (1992): "Seignorage and political instability", *American Economic Review*, 82, 537-555.
- Deaton, A. (1992): *Understanding consumption*, Oxford University Press, Oxford.
- Duesenberry, J.S. (1949): *Income, saving and the theory of consumer behavior*, Harvard University Press, Cambridge (Mass.).
- Easterlin, R.A. (1974): "Does economic growth improve the human lot? Some empirical evidence", in P.A. David and M.W. Reider (eds.), *Nations and Households in Economic Growth: Essays in Honor of Moses Abramovitz*, New York, Academic Free Press, 89-125.
- Fiorina, M.P. (1999): "Whatever happened to the median voter?", manuscript, Stanford University.
- Fredrick, S. and G. Loewenstein (1999): "Hedonic adaptation", in D. Kahneman, E. Diener and N. Schwarz (eds.), *Well-Being: The Foundations of Hedonic Psychology*, New York, Russell Sage Foundation, 302-329.
- Glaeser, E.L., G.A.M. Ponzetto and J.M. Shapiro (2005): "Strategic extremism: Why democrats and republicans divide on religious values", *Quarterly Journal of Economics*, 120, 1283-1330.
- Glazer, A. (1989): "Politics and the choice of durability", *American Economic Review*, 79, 1207-1214.
- Glazer, A., M. Gradstein and K.A. Konrad (1998): "The electoral politics of extreme policies", *Economic Journal*, 108, 1677-1685.
- Ljungqvist, L. and H. Uhlig (2000): "Tax policy and aggregate demand management under catching up with the Joneses", *American Economic Review*, 90, 356-366.

OECD (2006): *Economic Outlook 80*, Paris.

Persson, T. and L.E.O. Svensson (1989): "Why a stubborn conservative would run a deficit: Policy with time-inconsistent preferences", *Quarterly Journal of Economics*, 104, 325-345.

Persson, T. and G. Tabellini (2000): *Political Economics - Explaining Economic Policy*, MIT Press, Cambridge, Massachusetts.

Petterson, P. (2001): "An empirical investigation of the strategic use of debt", *Journal of Political Economy*, 109, 570-584, 2001.

Rabin, M. (1998): "Psychology and economics", *Journal of Economic Literature*, 36, 11-46.

Rabin, M. (2002): "A perspective on psychology and economics", *European Economic Review*, 46, 657-685.

Rabinowitz, G. and S.E. Macdonald (1989): "A directional theory of issue voting", *American Political Science Review*, 83, 91-121.

Ryder, H.E. Jr. and G.M. Heal (1973): "Optimal growth with intertemporally dependent preferences", *Review of Economic Studies*, 40, 1-33.

Solnick, S.J. and D. Hemenway (2005): "Are positional concerns stronger in some domains than in others?", *American Economic Review*, 95, 147-151.

Tabellini, G. and A. Alesina (1990): "Voting on the budget deficit", *American Economic Review*, 80, 37-49.

CESifo Working Paper Series

for full list see www.cesifo-group.org/wp

(address: Poschingerstr. 5, 81679 Munich, Germany, office@cesifo.de)

- 2104 Laszlo Goerke and Marco Runkel, Tax Evasion and Competition, September 2007
- 2105 Scott Alan Carson, Slave Prices, Geography and Insolation in 19th Century African-American Stature, September 2007
- 2106 Wolfram F. Richter, Efficient Tax Policy Ranks Education Higher than Saving, October 2007
- 2107 Jarko Fidrmuc and Roman Horváth, Volatility of Exchange Rates in Selected New EU Members: Evidence from Daily Data, October 2007
- 2108 Torben M. Andersen and Michael Svarer, Flexicurity – Labour Market Performance in Denmark, October 2007
- 2109 Jonathan P. Thomas and Tim Worrall, Limited Commitment Models of the Labor Market, October 2007
- 2110 Carlos Pestana Barros, Guglielmo Maria Caporale and Luis A. Gil-Alana, Identification of Segments of European Banks with a Latent Class Frontier Model, October 2007
- 2111 Felicitas Nowak-Lehmann D., Sebastian Vollmer and Immaculada Martínez-Zarzoso, Competitiveness – A Comparison of China and Mexico, October 2007
- 2112 Mark Mink, Jan P.A.M. Jacobs and Jakob de Haan, Measuring Synchronicity and Co-movement of Business Cycles with an Application to the Euro Area, October 2007
- 2113 Ossip Hühnerbein and Tobias Seidel, Intra-regional Tax Competition and Economic Geography, October 2007
- 2114 Christian Keuschnigg, Exports, Foreign Direct Investment and the Costs of Corporate Taxation, October 2007
- 2115 Werner Bönte, Oliver Falck and Stephan Heblich, Demography and Innovative Entrepreneurship, October 2007
- 2116 Katrin Assenmacher-Wesche and M. Hashem Pesaran, Assessing Forecast Uncertainties in a VECX Model for Switzerland: An Exercise in Forecast Combination across Models and Observation Windows, October 2007
- 2117 Ben Lockwood, Voting, Lobbying, and the Decentralization Theorem, October 2007
- 2118 Andrea Ichino, Guido Schwerdt, Rudolf Winter-Ebmer and Josef Zweimüller, Too Old to Work, too Young to Retire?, October 2007

- 2119 Wolfgang Eggert, Tim Krieger and Volker Meier, Education, Unemployment and Migration, October 2007
- 2120 Stefan Napel and Mika Widgrén, The European Commission – Appointment, Preferences, and Institutional Relations, October 2007
- 2121 Bertil Holmlund and Martin Söderström, Estimating Income Responses to Tax Changes: A Dynamic Panel Data Approach, October 2007
- 2122 Doina Maria Radulescu, From Separate Accounting to Formula Apportionment: Analysis in a Dynamic Framework, October 2007
- 2123 Jelle Brouwer, Richard Paap and Jean-Marie Viaene, The Trade and FDI Effects of EMU Enlargement, October 2007
- 2124 Kurt R. Brekke, Luigi Siciliani and Odd Rune Straume, Competition and Waiting Times in Hospital Markets, October 2007
- 2125 Alexis Direr, Flexible Life Annuities, October 2007
- 2126 Johannes Becker and Clemens Fuest, Quality versus Quantity – The Composition Effect of Corporate Taxation on Foreign Direct Investment, October 2007
- 2127 Balázs Égert, Real Convergence, Price Level Convergence and Inflation Differentials in Europe, October 2007
- 2128 Marko Koethenbueger, Revisiting the “Decentralization Theorem” – On the Role of Externalities, October 2007
- 2129 Axel Dreher, Silvia Marchesi and James Raymond Vreeland, The Politics of IMF Forecasts, October 2007
- 2130 Andreas Knabe and Ronnie Schöb, Subsidizing Extra Jobs: Promoting Employment by Taming the Unions, October 2007
- 2131 Michel Beine and Bertrand Candelon, Liberalization and Stock Market Co-Movement between Emerging Economies, October 2007
- 2132 Dieter M. Urban, FDI Technology Spillovers and Wages, October 2007
- 2133 Valentina Bosetti, Carlo Carraro, Emanuele Massetti and Massimo Tavoni, Optimal Energy Investment and R&D Strategies to Stabilise Greenhouse Gas Atmospheric Concentrations, October 2007
- 2134 David-Jan Jansen and Jakob de Haan, The Importance of Being Vigilant: Has ECB Communication Influenced Euro Area Inflation Expectations?, October 2007
- 2135 Oliver Falck, Heavyweights – The Impact of Large Businesses on Productivity Growth, October 2007

- 2136 Xavier Freixas and Bruno M. Parigi, Banking Regulation and Prompt Corrective Action, November 2007
- 2137 Jan K. Brueckner, Partial Fiscal Decentralization, November 2007
- 2138 Silvia Console Battilana, Uncovered Power: External Agenda Setting, Sophisticated Voting, and Transnational Lobbying, November 2007
- 2139 Alan J. Auerbach, Michael P. Devereux and Helen Simpson, Taxing Corporate Income, November 2007
- 2140 Lorenzo Cappellari, Paolo Ghinetti and Gilberto Turati, On Time and Money Donations, November 2007
- 2141 Roel Beetsma and Heikki Oksanen, Pension Systems, Ageing and the Stability and Growth Pact, November 2007
- 2142 Hikaru Ogawa and David E. Wildasin, Think Locally, Act Locally: Spillovers, Spillbacks, and Efficient Decentralized Policymaking, November 2007
- 2143 Alessandro Cigno, A Theoretical Analysis of the Effects of Legislation on Marriage, Fertility, Domestic Division of Labour, and the Education of Children, November 2007
- 2144 Kai A. Konrad, Mobile Tax Base as a Global Common, November 2007
- 2145 Ola Kvaløy and Trond E. Olsen, The Rise of Individual Performance Pay, November 2007
- 2146 Guglielmo Maria Caporale, Yannis Georgellis, Nicholas Tsitsianis and Ya Ping Yin, Income and Happiness across Europe: Do Reference Values Matter?, November 2007
- 2147 Dan Anderberg, Tax Credits, Income Support and Partnership Decisions, November 2007
- 2148 Andreas Irmen and Rainer Klump, Factor Substitution, Income Distribution, and Growth in a Generalized Neoclassical Model, November 2007
- 2149 Lorenz Blume, Jens Müller and Stefan Voigt, The Economic Effects of Direct Democracy – A First Global Assessment, November 2007
- 2150 Axel Dreher, Pierre-Guillaume Méon and Friedrich Schneider, The Devil is in the Shadow – Do Institutions Affect Income and Productivity or only Official Income and Official Productivity?, November 2007
- 2151 Valentina Bosetti, Carlo Carraro, Emanuele Massetti and Massimo Tavoni, International Energy R&D Spillovers and the Economics of Greenhouse Gas Atmospheric Stabilization, November 2007
- 2152 Balázs Égert and Dubravko Mihaljek, Determinants of House Prices in Central and Eastern Europe, November 2007

- 2153 Christa Hainz and Hendrik Hakenes, The Politician and his Banker, November 2007
- 2154 Josef Falkinger, Distribution and Use of Knowledge under the “Laws of the Web”, December 2007
- 2155 Thorvaldur Gylfason and Eduard Hochreiter, Growing Apart? A Tale of Two Republics: Estonia and Georgia, December 2007
- 2156 Morris A. Davis and François Ortalo-Magné, Household Expenditures, Wages, Rents, December 2007
- 2157 Andreas Haufler and Christian Schulte, Merger Policy and Tax Competition, December 2007
- 2158 Marko Köthenbürger and Panu Poutvaara, Rent Taxation and its Intertemporal Welfare Effects in a Small Open Economy, December 2007
- 2159 Betsey Stevenson, Title IX and the Evolution of High School Sports, December 2007
- 2160 Stergios Skaperdas and Samarth Vaidya, Persuasion as a Contest, December 2007
- 2161 Morten Bennedsen and Christian Schultz, Arm’s Length Provision of Public Services, December 2007
- 2162 Bas Jacobs, Optimal Redistributive Tax and Education Policies in General Equilibrium, December 2007
- 2163 Christian Jaag, Christian Keuschnigg and Mirela Keuschnigg, Pension Reform, Retirement and Life-Cycle Unemployment, December 2007
- 2164 Dieter M. Urban, Terms of Trade, Catch-up, and Home Market Effect: The Example of Japan, December 2007
- 2165 Marcelo Resende and Rodrigo M. Zeidan, Lionel Robbins: A Methodological Reappraisal, December 2007
- 2166 Samuel Bentolila, Juan J. Dolado and Juan F. Jimeno, Does Immigration Affect the Phillips Curve? Some Evidence for Spain, December 2007
- 2167 Rainald Borck, Federalism, Fertility and Growth, December 2007
- 2168 Erkki Koskela and Jan König, Strategic Outsourcing, Profit Sharing and Equilibrium Unemployment, December 2007
- 2169 Egil Matsen and Øystein Thøgersen, Habit Formation, Strategic Extremism and Debt Policy, December 2007