Public Choice (2019) 180:285–300
https://doi.org/10.1007/s11127-018-00636-6

The incumbent's preference for imperfect commitment

Matthias Wrede[1,2]

Received: 17 May 2018 / Accepted: 29 December 2018 / Published online: 8 January 2019

Abstract
Using a model with forward-looking voting strategies, we examine the tax policies of public officials who maximize the weighted average of rents and benefits to their specific electoral clienteles when commitment is possible. We assume that the degree of commitment to a tax policy can be varied through its design and institutional anchoring. At the center of the analysis lies the question of the extent to which public officials restrict the policy space of future governments. On the one hand, stronger restrictions make it more difficult for political opponents to enact unwanted policy changes, but, on the other hand, they also reduce the likelihood of reelection. We show that incumbents prefer perfect commitment to the absence of any commitment and that, from the point of view of an incumbent, imperfect commitment can be superior to perfect commitment. Imperfect commitment allows incumbents to raise their reelection chances either by binding themselves and causing the opponent to deviate or binding the opponent and deviating themselves.

Keywords Rent seeking · Electoral competition · Imperfect commitment · Rules · Discretion

JEL Classification C72 · D72 · D78

1 Introduction

In politics, it is common practice to include fiscal rules in the constitution, to engage in international treaties, to delegate tasks to an independent body, and to borrow in order to limit the future political options. Restricting the room for maneuvering makes

✉ Matthias Wrede
matthias.wrede@fau.de

[1] School of Business and Economics, Friedrich-Alexander University Erlangen-Nürnberg (FAU), PO Box 3931, 90020 Nürnberg, Germany

[2] CESifo, Poschingerstr. 5, 81679 Munich, Germany

announcements about future policies credible so that the other actors rely on those announcements for ensuring desirable behavior. Inefficient, time-inconsistent policies can be avoided by commitment (Barro and Gordon 1983; Kydland and Prescott 1977).[1] Restricting discretionary actions may also allow incumbents to prevent successors from attaining their goals, thereby extending the reach of their policies beyond their terms in office (Persson and Svensson 1989). Binding rules change the political agenda and influence election results. The long-term determination of particular policy issues limits the dimensions of feasible policy space so that policy choices and reelection opportunities depend on the remaining unfixed policy dimensions.

In the literature, the degree of commitment to a rule usually is considered to be a binary variable so that politics are fully discretionary or perfectly determined by rules. In real politics, deviations from the rules can occur; however, they are costly for the deviant. The costs imposed by a necessary legislative action, can be either monetary or non-monetary. The sizes of deviation costs and, thus, the degree of commitment depend on the design and the institutional anchoring. It is, therefore, in the hands of the incumbent to decide the degree of commitment.

In this paper, we examine limits on future policy choices when the deciding incumbent can vary the degree of commitment. We ignore potential time inconsistencies and focus entirely on the conflicts of interest between voter groups and the impact of commitment on incumbents' reelection chances. Unlike previous studies, we examine primarily the differences in binding powers for different politicians. We investigate the advantages and disadvantages of an asymmetrical commitment effect that causes only some successors to deviate from the established rules.

Above all, this paper makes two contributions to the literature on commitment and agenda setting. First, we show that it can be optimal for decision makers to set their degree of commitment at an intermediate level; the extremes (i.e., no commitment or perfect commitment) need not be optimal. Second, we demonstrate that a moderate degree of commitment is superior to perfect commitment because only a few of the politicians in the following period will abide by the rules and because it increases the incumbent's reelection probability. Interestingly, optimal imperfect commitment also could imply that the incumbent complies with the rules, but the opponent deviates. With moderate commitment, the incumbent can influence future politics and its effects on the electorate in a more targeted and differentiated way. The superiority of imperfect commitment does not require implementing commitment to be costly per se, but, if such costs are incurred, the incumbent would lean even more closely toward imperfect commitment.

As an example, consider the following circumstances in which imperfect commitment might be optimal for the ruling party. Two parties are assumed: Party L, which wants to redistribute taxes to the benefit of the poor and Party R, which wants to prevent redistribution. It is assumed that Party L rules. The governing party determines income tax brackets and tax rates. The members of Party L want a very progressive income tax, while the members of Party R are opposed to a progressive tax. Imperfect commitment could mean that the degree of progressivity is so high that Party L will not change the tax system after the election, while Party R will. In order to win the majority of the votes, the tax should be only slightly progressive so that the constituents of the opposition Party R are not overburdened financially. Low and middle-income voters, therefore, choose Party L and Party

[1] Self-commitment also allows politicians to avoid their own inconsistent behavior triggered by non-exponential discounting (Laibson 1997).

L receives more than 50% of the votes. On the other hand, if Party L imposes a highly progressive income tax, it would lose votes from middle-income voters and risk losing the election. If the incumbent party now raises the cost of changing the tax laws, for example, by adopting a higher parliamentary approval threshold, making tax changes difficult for everyone, including Party R, and, at the same time, opting for the much-preferred highly progressive income tax code, then the risk of losing the election rises. Hence, the probability that Party L will not have access to the rent from being in office increases. In this case, a stronger commitment to a progressive tax policy is detrimental for Party L. The situation is analogous for Party R if it were in office.

More generally, any legal action in which either only the governing party or only the opposition is expected to change the rules in the future to favor its own electorate is a manifestation of an imperfect commitment to legislation. Whether it is a regulation, law, or constitutional amendment, the legislature chooses the level of costs associated with political, social and economic changes, the evaluation of which generally will not be the same for all political parties. Thus, such legal action will not bind the hands of all succeeding governments equally.

Related Literature Setting the agenda by selecting issues or alternatives has long been recognized as an instrument to manipulate electoral outcomes and future policy choices (e.g., Romer and Rosenthal 1978; Glazer and Lohmann 1999; Dellis 2009; Aragonès et al. 2015; Dragu and Fan 2016; Chen and Eraslan 2017). de Figueiredo Jr (2002) demonstrates theoretically that only electorally weak groups will attempt to insulate their preferred policies from revision or repeal; de Figueiredo Jr (2003) provides evidence from the United States in support of that hypothesis. Canes-Wrone and Shotts (2007) develop a model with imperfect information to show that politicians' motives for signalling preference similarity with voters can induce policy rigidity. The optimal degree of commitment already has been addressed by Rogoff (1985) not in the context of its impact on election results, but, rather, the desirability of supporting time-consistent policies (see also Hanssen 2004). Pani and Perroni (1999) examine imperfect commitment in a repeated-voting model where short-term and long-term gains are traded off. Aghion and Bolton (1990) provide an example of policy decisions that have asymmetrical effects on the policy choices of different candidates and, thus, affect election results. Milesi-Ferretti (1995) considers the tradeoff between the incumbent's incentive to increase his or her reelection probability and the incentive to restrict the behavior of a successor with different preferences. Saint-Paul et al. (2016) demonstrate that politicians might select policies that harm members of their own constituencies if such policies increase voters' demands and, thus, economic incentives to vote for the politicians. Betz (2018) also examines the tradeoff between tying the hands of the successor and the candidate's ability to leverage differences with the opposition in the next election, but does not consider imperfect commitment. Crain (2001) discusses various institutional sources of durability, e.g., constitutional change, executive branch veto, committee system (see also, among others, Crain and Tollison 1979; Crain et al. 1988; Crain and Sullivan 1997).

The paper is organized as follows. Section 2 develops the theoretical model, analyzes the degree of commitment, and uses numerical simulations to illustrate the theoretical findings. Section 3 draws conclusions from these findings.

2 Theoretical model

We consider an electorate that consists of two equally sized groups of voters who are interested only in their incomes net of taxes. The affiliation of a person with one of the two groups is observable and can be taken into account in assessing income taxes. We denote the size of the group as n_i, the exogenously determined gross income of a member of group i as y_i, and the tax applied to a member of group i as t_i. An increasing and strictly concave utility function $u = u(y_i - t_i)$ represents the taxpayer's preferences. From each group, a single candidate competes for political office. The candidate aims at maximizing a weighted average of utility derived from political rents and the utility of a representative member of the candidate's peer group. Rents are $r(t_1, t_2) = n_1 t_1 + n_2 t_2$, and the utility derived from them is $z = z(r)$, where the function z also is increasing and strictly concave. The weight attached to the representative group member's utility is denoted by δ_i, with $0 < \delta_i < 1$. The candidate will have access to the rent from being in office only if he or she is elected, which is indicated by the binary variable α_i that is equal to 1 if the candidate is elected and 0 if not. Hence, we can represent the politicians' utility as

$$v_i(t_1, t_2, \alpha_i) = (1 - \delta_i) z[r(t_1, t_2)]\alpha_i + \delta_i u(y_i - t_i), \quad i = 1, 2\,. \tag{1}$$

Taxes are subject to an upper bound, i.e., $t_i \leq \bar{t}$, with $\bar{t} < y_i$, $i = 1, 2$. Throughout this section, we focus on a symmetrical setup, i.e., $y_i = y$, $n_i = n/2$, and $\delta_i = \delta$, $i = 1, 2$.

In the "Appendix", we show that the key findings apply when voter groups differ and when tax revenue is used to fund a public good that benefits all voters.

We consider a game with two different levels, the constitutional level and the policy level. At the constitutional level, one of the two candidates is chosen randomly to determine the taxes for both groups of voters, which will apply at the policy level, and also, the degree of commitment to that decision. We call that politician the incumbent and consider the whole game from his or her perspective, i.e, the game starts with his or her decision and we do not consider explicitly the prior draw of nature. The degree of commitment is determined by the size of the costs, C, that are incurred at the policy level in the event of a deviation from the established tax rule. Deviation costs are positive and can be set arbitrarily high.[2] We assume that no additional costs are incurred by the politician at the constitutional level if the degree of tax-policy commitment rises. However, in the "Appendix", we discuss how the positive and increasing costs of implementing commitment can affect the results. To simplify the presentation of decisions at the constitutional level, we assume that the incumbent first determines the deviation costs and then the tax rates.

At the policy level, voters first select one of the two candidates, who then decides finally on the tax rates. If he or she deviates from the tax rates imposed at the constitutional level, the deviation costs, C, will accrue. The taxes ultimately imposed at the policy level are collected and determine the benefits of citizens and politicians. We assume that the described commitment mechanism for the decisions made at the constitutional level is in force, but that the candidates cannot commit to specific taxes for voters. Voters know that the elected politician will set the taxes in a way that maximizes his or her utility and, therefore, apply forward-looking voting strategies; retrospective voting strategies are ineffective within the described framework. In addition to voters, politicians also are forward-looking. In order

[2] We assume quasi-fixed deviation costs that do not depend on the extent of deviation. For example, the transaction costs of changing the law can be considered to be fixed.

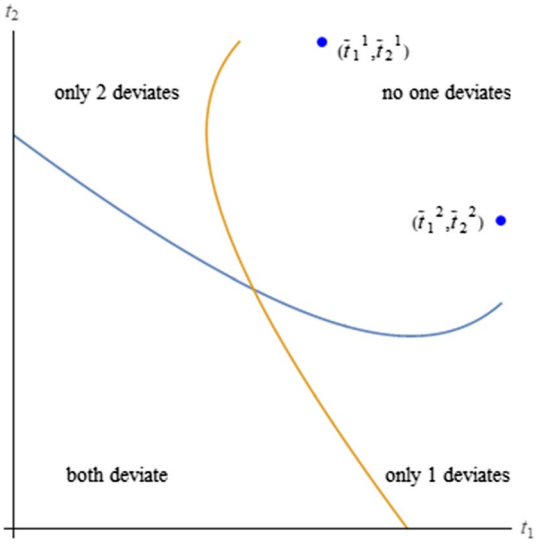

Fig. 1 Unconstrained optimal tax rates and deviations from tax rates set at the constitutional level

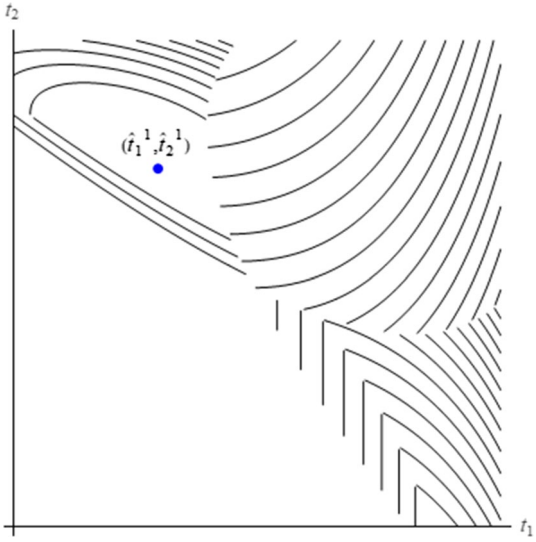

Fig. 2 Iso-expected-utility curves and policy choice of Politician 1 at the constitutional level

to account for possible prediction errors and ambivalence towards candidates, we apply probabilistic voting.[3]

To illustrate the results, we consider a numerical example with $z(x) = \ln x$ and $u(x) = \ln x$ (Figs. 1 and 2). The benchmark parameters are $n = 5$, $y = 1$, $\bar{t} = y * 0.75$, $\delta = 0.3$ and $C = 0.3$.

[3] Our voting model combines features taken from various other models: the citizen-candidate model introduced by Osborne and Slivinski (1996) and Besley and Coate (1997), the modified Leviathan model of Edwards and Keen (1996) and the probabilistic-voting model (e.g., Persson and Tabellini 2000).

We focus on a subgame-perfect equilibrium for the entire game that can be solved by backward induction.

First, we consider the decisions that the elected politician would make at the policy level if he or she were not constrained by deviation costs. Politician i, $i = 1, 2$, solves the optimization problem

$$\max_{t_1^i, t_2^i} (1-\delta) z[r(t_1^i, t_2^i)] + \delta u(y_i - t_i^i)\,. \tag{2}$$

The slopes of the indifference curves of Politicians 1 and 2 are

$$\left.\frac{dt_2}{dt_1}\right|_1 = -\frac{(1-\delta) n_1 z'[r(t_1,t_2)] - \delta u'(y_1 - t_1)}{(1-\delta) n_2 z'[r(t_1,t_2)]} \quad \text{and}$$
$$\left.\frac{dt_2}{dt_1}\right|_2 = -\frac{(1-\delta) n_1 z'[r(t_1,t_2)]}{(1-\delta) n_2 z'[r(t_1,t_2)] - \delta u'(y_2 - t_2)}.$$

In the tax range in which both curves are downward sloping, Politician's 1's indifference curve is flatter than Politician 2's:

$$-\left.\frac{dt_2}{dt_1}\right|_1 < 1 < -\left.\frac{dt_2}{dt_1}\right|_2 .$$

The willingness to pay for Group 2's tax rate in terms of the tax rate of Group 1 is lower for a member of Group 1. The first-order conditions of the politician's optimization problem (2) are[4]

$$t_i^i: \qquad (1-\delta) n_i z'[r(t_1^i, t_2^i)] - \delta u'(y_i - t_i^i) \le 0\,, \tag{3}$$

$$\begin{aligned} &\left\{(1-\delta) n_i z'[r(t_1^i, t_2^i)] - \delta u'(y_i - t_i^i)\right\} t_i^i = 0\,, \\ t_j^i: \quad &(1-\delta) n_j z'[r(t_1^i, t_2^i)] > 0\,, \qquad j \ne i\,. \end{aligned} \tag{4}$$

Every politician sets the tax rate that applies to the taxpayers from the other group as high as possible. If the weight of rents is sufficiently high, politicians also will tax the members of their own group. Hence, the solutions to the optimization problem (2), indicated by the symbol $\sim$, satisfy[5]

$$0 \le \tilde{t}_1^1 = \tilde{t}_2^2 < \bar{t} \quad \text{and} \quad \tilde{t}_2^1 = \tilde{t}_1^2 = \bar{t}\,.$$

Next, we analyze the decision of the ruling politician at the policy level concerning whether or not to deviate. To that end, we denote the tax rates determined at the constitutional level as $\check{t}_1$ and $\check{t}_2$. If politician i deviates, he or she sets tax rates $\tilde{t}_1^i$ and $\tilde{t}_2^i$, $i = 1, 2$. Hence, he or she deviates only if[6]

$$v_i(\tilde{t}_1^i, \tilde{t}_2^i, 1) > v_i(\check{t}_1, \check{t}_2, 1) + C\,. \tag{5}$$

The politician does not deviate if the predefined tax rates are sufficiently close to his or her own optimum tax rates (Fig. 1). We denote the optimum tax rate of politician i for group

[4] To exclude some corner solutions, we assume that the Inada condition $\lim_{x \to 0} u'(x) = \infty$ holds and that the weight politicians attach to voters' utility is not too low, i.e., $(1-\delta) z'[r(\bar{t}, \bar{t})] n/2 - \delta u'(y - \bar{t}) < 0$.

[5] In our numerical example, the optimum tax rate is $\tilde{t}_i^i = \max\{0, (1-\delta) y - \delta \bar{t}\}$, $i = 1, 2$.

[6] For simplicity, we assume that deviation costs enter utility additively.

j as $t_j^{i*} = t_j^{i*}(\check{t}_1, \check{t}_2, C)$, $i,j = 1,2$, and the actual deviation costs as $C^* = C^*(\check{t}_1, \check{t}_2, C)$, with $C^* = 0$ if $(t_1^{i\,*}, t_2^{i\,*}) = (\check{t}_1, \check{t}_2)$ and $C^* = C$ otherwise. Since voters adopt forward-looking voting strategies, we can deduce the election probability of politician i from the decisions that both politicians would make at the policy level, which, in turn, are determined by the tax rates set at the constitutional level and the deviation costs. Using probabilistic voting, politician i's probability of reelection is

$$p_i(\check{t}_1, \check{t}_2, C) = \max\left(0, \min\left\{1, \frac{1}{2} + \frac{n_i\left[u\left(y_i - t_i^{i*}\right) - u\left(y_i - t_i^{j*}\right)\right] + n_j\left[u\left(y_j - t_j^{i*}\right) - u\left(y_j - t_j^{j*}\right)\right]}{n_i + n_j}\right\}\right). \tag{6}$$

Ceteris paribus, the likelihood of a politician getting elected increases as the benefit that voters of his own electoral group receive from his or her policy increases, or when the utility loss that voters of the other electorate suffer as a result of the policy declines.

Now, we are able to consider policy choices at the constitutional level. The tax rates $\check{t}_1$ and $\check{t}_2$, determined at that level align with the following expected utility for politician i:

$$EV_i(\check{t}_1, \check{t}_2, C) = p_i(\check{t}_1, \check{t}_2, C)\left[v_i\left(t_1^{i\,*}, t_2^{i\,*}, 1\right) - C^*\right] + [1 - p_i(\check{t}_1, \check{t}_2, C)]v_i\left(t_1^{j\,*}, t_2^{j\,*}, 0\right), \tag{7}$$

where t_j^{i*}, $i,j = 1,2$, and C^* indicate functions as defined above. The expected utility is a weighted average of the utility of the elected and non-elected politician at the policy level. At the constitutional level, voters expect

$$\begin{aligned} EU_i(\check{t}_1, \check{t}_2, C) &= p_i(\check{t}_1, \check{t}_2, C)u_i\left(y_i - t_i^{i*}\right) + [1 - p_i(\check{t}_1, \check{t}_2, C)]u_i\left(y_i - t_i^{j*}\right), \\ EU_j(\check{t}_1, \check{t}_2, C) &= p_i(\check{t}_1, \check{t}_2, C)u_j\left(y_j - t_j^{i*}\right) + [1 - p_i(\check{t}_1, \check{t}_2, C)]u_j\left(y_j - t_j^{j*}\right), \end{aligned} \tag{8}$$

$i,j = 1,2$, $j \neq i$. The selected politician, i, called the incumbent, determines first deviation costs and then the tax rates that maximize his or her expected utility $EV_i(\check{t}_1, \check{t}_2, C)$. We denote the optimum tax-rate choices of incumbent i at the constitutional level by $\hat{t}_1^i$ and $\hat{t}_2^i$.[7]

We begin our analysis of tax-rate choices with the two extreme cases: prohibitively high deviation costs, $C = \infty$, and no deviation costs, $C = 0$.

If the deviation costs are prohibitively high, the tax rates determined at the constitutional level perfectly bind the ruling politician, who simply implements those tax rates at the policy level. Since the implemented tax policy is independent of the election result, the election probability for each candidate is $p_i = 1/2$, $i = 1,2$. Hence, at the constitutional level, the politician i's expected utility is

$$\begin{aligned} EV_i(t_1^i, t_2^i, \infty) &= \frac{v_i\left(t_1^i, t_2^i, 1\right) + v_i\left(t_1^i, t_2^i, 0\right)}{2} \\ &= (1-\delta)\frac{z[r(t_1^i, t_2^i)]}{2} + \delta u(y_i - t_i^i), \quad i = 1,2, \end{aligned} \tag{9}$$

[7] Because politicians themselves cannot commit in the election to certain tax rates and because in the perfect symmetric setting $EV_1(t_1, t_2, C) = EV_2(t_2, t_1, C)$, the chosen tax rates at the constitutional level are symmetrical, i.e., $\hat{t}_1^1 = \hat{t}_2^2$ and $\hat{t}_2^1 = \hat{t}_1^2$, which justifies our assumption of a random choice of one of the two candidates.

which he or she maximizes by his or her choice of tax rates. The first-order conditions of the politician's optimization problem are

$$t_i^i: \quad (1-\delta)\frac{n_i z'[r(t_1^i, t_2^i)]}{2} - \delta u'(y_i - t_i^i) \leq 0\,, \tag{10}$$

$$\begin{aligned} &\left\{(1-\delta)\frac{n_i z'[r(t_1^i, t_2^i)]}{2} - \delta u'(y_i - t_i^i)\right\} t_i^i = 0\,, \\ t_j^i: \quad &(1-\delta)\frac{n_j z'[r(t_1^i, t_2^i)]}{2} > 0\,, \qquad j \neq i\,. \end{aligned} \tag{11}$$

Since the politician's marginal utility of t_j^i is strictly positive, $\hat{t}_j^i = \bar{t}$, the expected utility of aligned voters, i, and unaligned voters, j, are $EU_i(\hat{t}_1^i, \hat{t}_2^i, \infty) = u(y_i - \hat{t}_i^i)$ and $EU_j(\hat{t}_1^i, \hat{t}_2^i, \infty) = u(y_j - \bar{t})$, respectively.

If the deviation costs are zero, the tax rates determined at the constitutional level do not bind the ruling politician at the policy level and he or she is free to select the tax rates that maximize his or her own utility. Hence, $t_j^{i*}(\check{t}_1, \check{t}_2, 0) = \tilde{t}_j^i$, $i,j = 1,2$. The symmetry of the tax choices implies that the voters' utility differences also are symmetrical, i.e., $u\left(y_i - t_i^{i*}\right) - u\left(y_i - t_i^{j*}\right) = u\left(y_j - t_j^{j*}\right) - u\left(y_j - t_j^{i*}\right)$. Hence, the election probability for each candidate is $p_i = 1/2$, $i = 1,2$. Consequently, at the constitutional level, independent of tax rate choices, politician i's expected utility is

$$\begin{aligned} EV_i(t_1, t_2, 0) =& \frac{v_i\left(\tilde{t}_1^i, \tilde{t}_2^i, 1\right) + v_i\left(\tilde{t}_1^j, \tilde{t}_2^j, 0\right)}{2} \\ =& (1-\delta)\frac{z[r(\tilde{t}_1^i, \tilde{t}_2^i)]}{2} + \delta\frac{u(y_i - \tilde{t}_i^i) + u(y_i - \tilde{t}_i^j)}{2} \\ =& (1-\delta)\frac{z[r(\tilde{t}_1^i, \tilde{t}_2^i)]}{2} + \delta u(y_i - \tilde{t}_i^i) + \delta\frac{u(y_i - \tilde{t}_i^j) - u(y_i - \tilde{t}_i^i)}{2}\,, i = 1,2. \end{aligned} \tag{12}$$

Voters of group i face the expected utility

$$EU_i(t_1, t_2, 0) = u(y_i - \tilde{t}_i^i) + \frac{u(y_i - \tilde{t}_i^j) - u(y_i - \tilde{t}_i^i)}{2}\,, i = 1,2\,. \tag{13}$$

Now, we are able to compare the tax rates and the induced politician's utility under both prohibitively high and zero deviation costs. In either case, the reelection probability that the ruling politician i at the constitutional level expects at the policy level is $p_i = 1/2$, which is independent of tax rate choices. Hence, he or she will capture the rents from being in office with a probability of only 1/2. Under prohibitively high deviation costs, the politician can ensure for his or her voters a utility level of $u(y_i - \hat{t}_i^i)$. With no deviation costs, his or her voters face the risk that the other candidate ultimately determines the tax rates with probability 1/2, which would imply maximum taxation, $\bar{t}$. Consequently, the ruling politician at the constitutional level who has at least some interest in his or her voters' utility is better off under prohibitively high deviation costs

than under none. Unsurprisingly, voters benefit from perfect commitment if the politician is from their group; otherwise perfect commitment harms them.

Proposition 1 summarizes the findings of the foregoing comparison and proves them formally.

Proposition 1 *At the constitutional level, (i) the ruling politician prefers prohibitively high deviation costs (perfect commitment) to no deviation costs (no commitment);*

(ii) aligned voters prefer perfect commitment to no commitment, whereas unaligned voters prefer no commitment to perfect commitment.

Proof (i) $EV_i(\hat{t}_1^i, \hat{t}_2^i, \infty) > EV_i(t_1, t_2, 0)$ because $\tilde{t}_i^i < \bar{t} = \tilde{t}_i^j$ and, therefore, $u(y_i - \tilde{t}_i^j) - u(y_i - \tilde{t}_i^i) < 0$ and $(\hat{t}_1^i, \hat{t}_2^i)$ maximizes $(1-\delta)z[r(t_1^i, t_2^i)]/2 + \delta u(y_i - t_i^i)$, whereas $(\tilde{t}_1^i, \tilde{t}_2^i)$ maximizes $(1-\delta)z[r(t_1^i, t_2^i)] + \delta u(y_i - t_i^i)$. Hence, $\hat{t}_i^i \leq \tilde{t}_i^i$ and $\hat{t}_i^j = \bar{t} = \tilde{t}_i^j$ for $j \neq i$.

(ii) Obviously, $EU_i(\hat{t}_1^i, \hat{t}_2^i, \infty) = u(y_i - \hat{t}_i^i) > [u(y_i - \tilde{t}_i^i) + u(y_i - \bar{t})]/2 = EU_i(t_1, t_2, 0)$ and $EU_j(\hat{t}_1^i, \hat{t}_2^i, \infty) < EU_j(t_1, t_2, 0)$ for $j \neq i$. □

After having studied the extreme cases, we turn to intermediate deviation costs. Any set of tax rates at the constitutional level that induces both of the politicians to deviate from the proposed tax rates cannot be optimal from ruling politician i's point of view.

That result can be demonstrated easily. Consider some policy (t_1', t_2') that causes both politicians to deviate at the policy level. If both politicians deviate and choose their most preferred tax rates, the reelection probability is $p_i = 1/2$. The outcome for politician i is $\left[v_i\left(\tilde{t}_1^i, \tilde{t}_2^i, 1\right) - C + v_i\left(\tilde{t}_1^j, \tilde{t}_2^j, 0\right)\right]/2$. However, the respective politicians' policy-level-optimum tax rates $(\tilde{t}_1^i, \tilde{t}_2^i)$ are better policy choices at the constitutional level than (t_1', t_2') because the politician i himself or herself will not deviate at the policy level, he or she avoids deviation costs, and the reelection probability still will be $p_i = 1/2$. If the tax rates at the constitutional level are $(\tilde{t}_1^i, \tilde{t}_2^i)$, the opponent may or may not deviate. If the opponent j deviated, he or she would choose $(\tilde{t}_1^j, \tilde{t}_2^j)$. Politician i achieves $\left[v_i\left(\tilde{t}_1^i, \tilde{t}_2^i, 1\right) + v_i\left(\tilde{t}_1^j, \tilde{t}_2^j, 0\right)\right]/2$. If the opponent j did not deviate, tax rates $(\tilde{t}_1^i, \tilde{t}_2^i)$ would be implemented in any case and the utility of politician i is $\left[v_i\left(\tilde{t}_1^i, \tilde{t}_2^i, 1\right) + v_i\left(\tilde{t}_1^i, \tilde{t}_2^i, 0\right)\right]/2$. The order of the outcomes of the three cases for the ruling politician i is

$$\frac{v_i\left(\tilde{t}_1^i, \tilde{t}_2^i, 1\right) - C + v_i\left(\tilde{t}_1^j, \tilde{t}_2^j, 0\right)}{2} < \frac{v_i\left(\tilde{t}_1^i, \tilde{t}_2^i, 1\right) + v_i\left(\tilde{t}_1^j, \tilde{t}_2^j, 0\right)}{2} < \frac{v_i\left(\tilde{t}_1^i, \tilde{t}_2^i, 1\right) + v_i\left(\tilde{t}_1^i, \tilde{t}_2^i, 0\right)}{2}. \tag{14}$$

Thus, (t_1', t_2') is not an optimal choice at the constitutional level.

For intermediate deviation costs, at the constitutional level, three types of tax-rate combinations exist that potentially are optimal for the ruling politician i, with $j \neq i$. First, the tax rate for the politician's electorate, t_i, is so low and the tax rate for the opponent's electorate, t_j, is so high that, at the policy level, politician i will stick to the proposed tax rates, but the opponent j will deviate. This tax policy might be optimal if it increases politician i's reelection probability substantially above 1/2 (only Politician 2 deviates, upper-left corner of Fig. 1). Second, the reverse strategy also might work: the tax rate for the politician's electorate, t_i, is so high and the tax rate for the opponent's electorate, t_j, is so low that, at

the policy level, the politician i will deviate but the opponent j will not (only Politician 1 deviates, lower-right corner of Fig. 1). That strategy also is successful only if it increases politician i's reelection probability well above 1/2. It even could increase the reelection probability to almost one, because even for politician i's voters the proposed tax rates are very detrimental. Third, both tax rates are so high that neither politician deviates and the election probability is 1/2 (neither politician deviates, upper-right corner of Fig. 1). Actually, at well below $C = \infty$, deviation costs might be prohibitively high, in which case, the politician selects tax rates as described in the paragraph on the tax-rate choices for prohibitively high deviation costs, provided that those taxes provide no incentive to deviate.

Henceforth, we examine in greater detail the tax policies that induce only one party to deviate. At the constitutional level, if, at the policy level, only opponent j deviates, ruling politician i achieves the expected utility (with $j \neq i$):

$$EV_i(\check{t}_1, \check{t}_2, C) = p_i(\check{t}_1, \check{t}_2, C)v_i\left(\check{t}_1, \check{t}_2, 1\right) + [1 - p_i(\check{t}_1, \check{t}_2, C)]v_i\left(\tilde{t}_1^j, \tilde{t}_2^j, 0\right), \tag{15}$$

where

$$p_i(\check{t}_1, \check{t}_2, C) = \frac{1}{2} + \frac{u\left(y_i - \check{t}_i\right) - u\left(y_i - \bar{t}\right) + u\left(y_j - \check{t}_j\right) - u\left(y_j - \tilde{t}_j^j\right)}{2}.$$

If $\tilde{t}_j^j - \check{t}_i = \tilde{t}_i^i - \check{t}_i$ and $\bar{t} - \check{t}_j$ are sufficiently large, the reelection probability p_i exceeds 1/2. At the policy level, the politicians will behave only as described, i.e., only opponent j deviates, if the tax rates and the deviation costs satisfy

$$\check{t}_i < \check{t}_j \text{and } v_j\left(\tilde{t}_1^j, \tilde{t}_2^j, 1\right) - v_j(\check{t}_1, \check{t}_2, 1) > C > v_i\left(\tilde{t}_1^i, \tilde{t}_2^i, 1\right) - v_i(\check{t}_1, \check{t}_2, 1). \tag{16}$$

Hence, to achieve the suggested deviation pattern, the tax policy must favor the electorate of the ruling politician and deviation costs are bound both from below and above.

Similarly, at the constitutional level, if, at the policy level, only opponent j complies with the predetermined policy, ruling politician i achieves expected utility (with $j \neq i$) of:

$$EV_i(\check{t}_1, \check{t}_2, C) = p_i(\check{t}_1, \check{t}_2, C)\left[v_i\left(\tilde{t}_1^i, \tilde{t}_2^i, 1\right) - C\right] + [1 - p_i(\check{t}_1, \check{t}_2, C)]v_i\left(\check{t}_1, \check{t}_2, 0\right), \tag{17}$$

where

$$p_i(\check{t}_1, \check{t}_2, C) = \frac{1}{2} + \frac{u\left(y_i - \tilde{t}_i^i\right) - u\left(y_i - \check{t}_i\right) + u\left(y_j - \bar{t}\right) - u\left(y_j - \check{t}_j\right)}{2}.$$

If $\check{t}_i - \tilde{t}_i^i$ and $\check{t}_j - \bar{t}$ are sufficiently large, the reelection probability p_i is greater than 1/2. At the policy level, the politicians will behave only as described, i.e., only ruling politician i deviates, if the tax rates and the deviation costs satisfy

$$\check{t}_i > \check{t}_j \text{ and } v_i\left(\tilde{t}_1^i, \tilde{t}_2^i, 1\right) - v_i(\check{t}_1, \check{t}_2, 1) > C > v_j\left(\tilde{t}_1^j, \tilde{t}_2^j, 1\right) - v_j(\check{t}_1, \check{t}_2, 1). \tag{18}$$

Again, deviation costs are bound both from below and above, but the tax policy must favor the electorate of the opponent.

By means of the numerical example, it can be demonstrated easily that, in the subgame perfect equilibrium, for some level of deviation costs and rent weights, only the politician who already was in power at the constitutional level will deviate; for other parameters, only the opponent will deviate and, for a third set of parameters, both politicians will deviate. Figure 2 demonstrates that, for

Table 1 Deviation costs and tax rate choices at the constitutional level

C	$\hat{\tau}_i^i$	$\hat{\tau}_j^i$	EV_i
0.05	0.375	0.485287	0.0371333
0.3	0.220853	0.552131	0.377401
0.5	0.192308	0.75	0.235831

the given benchmark parameters, in the subgame perfect equilibrium, the politician in power at the constitutional level selects the tax rates that provide incentives to deviate only for his or her opponent.

Moreover, we can use the same numerical example to demonstrate that parameters exist such that, at the constitutional level, the politician prefers medium commitment costs inducing a partial commitment to prohibitively high deviation costs inducing perfect commitment. Starting at $C = 0$ and increasing C, the expected utility of the incumbent first declines for low deviation costs, then rises discontinuously up to the maximum level, where it stays constant over a certain range for medium deviation costs and, finally, declines discontinuously and stays constant for high deviation costs. Table 1 shows the results.

The intuition for the possible superiority of partial commitment is as follows: If the deviation cost is sufficiently high, both politicians will not deviate. Politicians do not have to bear the deviation cost, but both will implement the same policy and, therefore, each can be reelected with a probability of 1/2. At a high deviation cost, the incumbent will, therefore, not capture the political rent, r, with a probability of 1/2. In contrast, under a medium deviation cost, one politician will deviate. At the constitutional level, the tax rates can then be set so that the incumbent is more likely to be reelected than with a probability of 1/2. That outcome depends on the weighting, $1 - \delta$, of the political rent in the politician's utility function, whether it is worth setting tax rates so that they are not optimal for the politician after the election, but the probability of being elected is high. If the weight of the policy rent is sufficiently small, high deviation costs and perfect commitment are optimal; with a heavier weighting of the policy rent, a medium deviation cost and imperfect commitment can be optimal.

Proposition 2 summarizes our findings regarding imperfect commitment.

Proposition 2 *At the constitutional level, (i) for a given level of positive deviation costs and for every combination of taxes that induces both politicians to deviate at the policy level there exists a combination of taxes that provides incentives for at least one politician not to deviate and is preferred by the ruling politician;*

(ii) there exist model parameters such that the ruling politician prefers compliance with the rules by only one politician (imperfect commitment) to rule compliance by both politicians (perfect commitment).

3 Conclusions

In this paper, we examined restrictions on future policy choices, when the incumbent can vary his or her own and successors' extent of commitment. We investigated the advantages and disadvantages of effectively asymmetrical strong commitments that cause only some successors to deviate from the established rules. We showed that imperfect commitment can be optimal from the incumbent's point of view. We demonstrated that a moderate degree of commitment

is superior to perfect commitment because only a few politicians in the following periods will abide by the rules and because it increases the incumbent's reelection probability.

Our study leaves various issues for future investigation. In order to be able to make predictions as to who would prefer a high or low commitment level, it is necessary to consider all forms of asymmetry in the electorate. To accommodate the need for policy flexibility, one could add exogenous shocks to the model, which, in turn, would require deviation costs to vary with the extent of deviation from established policies.

Acknowledgements The comments from the editor and two anonymous referees of this journal and from Andreas Mense are greatly appreciated.

Appendix

Costs of implementing a commitment

If we introduce the costs of implementing a commitment at the constitutional level that are positively associated with the deviation costs, $\chi(C)$, with $\chi' > 0$ and $\chi'' \geq 0$, commitment becomes less attractive. Hence, Proposition 1 no longer holds. At the constitutional level, the ruling politician prefers no deviation costs to infinitely high deviation costs. Even finite, but large deviation costs may be inferior to no deviation costs. Compared to perfect commitment, imperfect commitment is even more preferable. Furthermore, the lowest value of

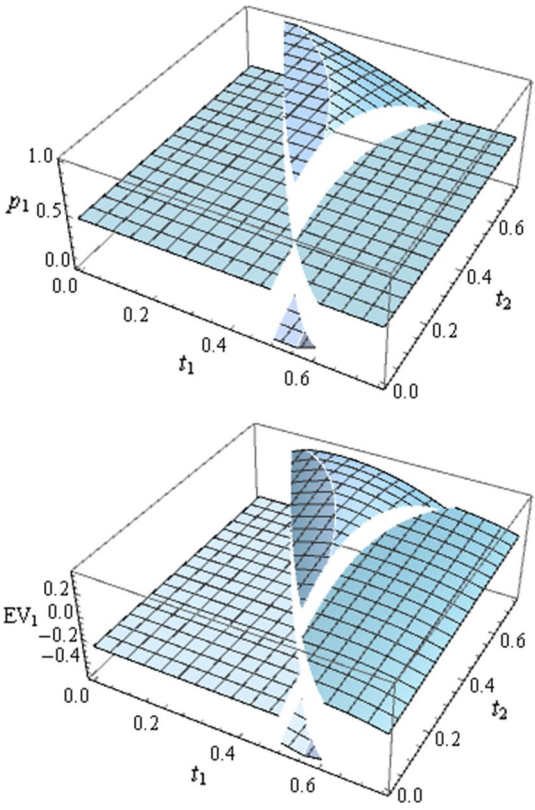

Fig. 3 Election probability and expected utility of Politician 1 at the constitutional level if $n_1 > n_2$

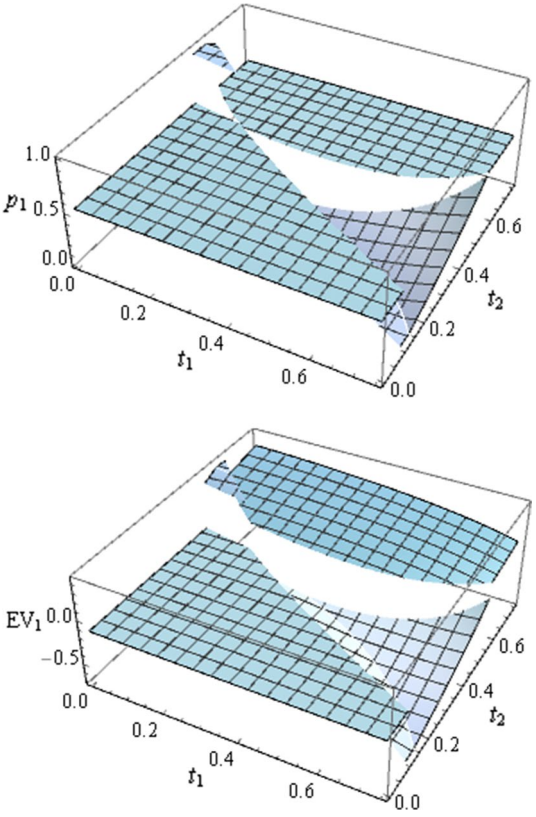

Fig. 4 Election probability and expected utility of Politician 1 at the constitutional level if $n_1 < n_2$

deviation costs that makes at least one politician deviate is most likely the preferred choice for the incumbent.

Imperfect commitment with asymmetry in size of voter groups

We introduce asymmetry in size, $n_1 \neq n_2$, which implies asymmetry in policy choices at both stages of the game. We leave the numerical example as is, but set $n_i = n/2 + 1$ and $n_j = n/2 - 1$, $j \neq i$. Figures 3 and 4 show the reelection probability and the expected utility of the politician in charge at the constitutional level if the politician is member of the larger or smaller group, respectively. A comparison of Figs. 3 and 4 demonstrates that asymmetry in group size has different effects on candidates of the larger and smaller voter group. Interestingly, the politician representing the smaller electorate faces a higher election probability than the opponent if both politicians deviate because he or she can skim off fewer rents from his or her own supporters and faces, therefore, weaker incentives to increase the tax rate for his or her constituency. Regardless, at the given level of deviation costs, both the larger and smaller party set tax rates such that the opponent, but not the incumbent, will deviate. Furthermore, in the numerical example, the politician associated with the larger group prefers imperfect commitment to perfect commitment. For a full analysis of the decisions at all levels, including the selection of politicians, under asymmetrical conditions, we have to modify our assumption

of a random choice of the ruling politician at the constitutional level; however, that topic is reserved for future studies.

Imperfect commitment with common interest and uncertainty

We introduce a public good, G, and uncertainty about its costs. The well-behaved utility function of voter i is $u(y_i - t_i, G)$ and the rent net of public expenditure is $r(t_1, t_2, G, \kappa_k) = n_1 t_1 + n_2 t_2 - \kappa_k G$, with κ_k, $k = l, h$ indicating the per-unit cost of public-good production, where $\kappa_l < \kappa_h$. For simplicity, we assume an additively separable voter utility function $u(y_i - t_i, G)$. We modify the politician's utility accordingly. The probability of the costs being equal to κ_k is q_k, $i = l, h$. Public good costs are revealed at the beginning of the public policy level, such that voters and politicians know the true costs. To account for the fact that uncertainty requires some flexibility, we assume that the incumbent can commit to tax rates only, but not to public good provision. The public good is the residual parameter that always is determined by the politician at the policy level. Hence, for given tax rates t_1 and t_2 at the policy level, the politician maximizes his or her utility by solving

$$\max_G v_i(t_1, t_2, G, \kappa_k, \alpha_i) = (1 - \delta_i) z[r(t_1, t_2, G, \kappa_k)]\alpha_i + \delta_i u(y_i - t_i, G), \quad i = 1, 2\,.$$

The first-order condition for an interior solution for $\alpha_i = 1$,

$$-(1 - \delta)\kappa_k z'[r(t_1, t_2, G, \kappa_k)] + \delta \partial u(y - t_i, G)/\partial G = 0, \quad i = 1, 2\,,$$

determines $G = G_i(t_1, t_2, \kappa_k)$ with

$$\frac{\partial G_i}{\partial \kappa_k} = \frac{z'(1 - \delta) - z''(1 - \delta)\kappa_k G_i}{z''(1 - \delta)\kappa_k^2 + \delta(\partial^2 u/\partial G_i^2)} < 0\,,$$
$$\frac{\partial G_i}{\partial t_i} = \frac{\partial G_i}{\partial t_j} = \frac{z''(1 - \delta)\kappa_k n/2}{z''(1 - \delta)\kappa_k^2 + \delta(\partial^2 u/\partial G_i^2)} > 0$$

for $n_i = n_j = n/2$. If the politician determines the tax rates at the policy level, he or she will tax the opponent's electorate prohibitively. We also assume, as before, that interest in the own supporting group is sufficiently strong such that $0 \le \tilde{t}_i^i < \tilde{t}_i^j = \bar{t}$.

At the constitutional level, incumbent i determines taxes by solving

$$\max_{t_1^i, t_2^i} EV_i(t_1^i, t_2^i, C) := \sum_{k=l,h} q_k \Big\{ p_i(t_1^i, t_2^i, \kappa_k, C)\Big[v_i(t_1^{i*}, t_2^{i*}, G_i(t_1^{i*}, t_2^{i*}, \kappa_k), \kappa_k, 1) - C^*\Big] +$$
$$[1 - p_i(t_1^i, t_2^i, \kappa_k, C)] v_i(t_1^{j*}, t_2^{j*}, G_j(t_1^{j*}, t_2^{j*}, \kappa_k), \kappa_k, 0)\Big\}\,,$$

where $t_l^{m*} = t_l^{m*}(t_1^i, t_2^i, \kappa_k, C)$ and $C^* = C^*(t_1^i, t_2^i, \kappa_k, C)$, $i, l, m = 1, 2$.

If deviation costs are zero, $t_j^{i*} = \tilde{t}_j^i(\kappa_k)$, $C^* = 0$, and $p_i(t_1^i, t_2^i, \kappa_k, C) = 1/2$, $i, j = 1, 2$, $k = l, h$. If deviation costs are prohibitively high, $t_j^{i*} = t_j^i$, $C^* = 0$ and $p_i(t_1^i, t_2^i, \kappa_k, C) = 1/2$, $i, j = 1, 2$. Hence, Proposition 1 may not hold if $\tilde{t}_j^i(\kappa_l) \neq \tilde{t}_j^i(\kappa_h)$; otherwise, Proposition 1 still holds. If tax rates determined at the policy level vary with the public good's costs, the incumbent may benefit considerably from flexibility, but otherwise he or she still prefers prohibitively high deviation costs (perfect commitment) to no deviation costs (no commitment). Intermediate deviation costs allow incumbents to increase their reelection chances by either binding themselves and causing the opponent to deviate or binding the opponent

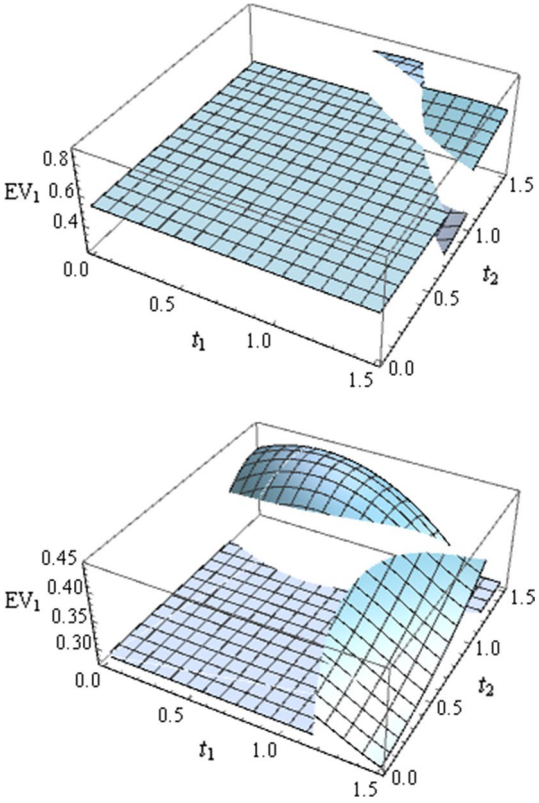

Fig. 5 Expected utility of Politician 1 at the constitutional level for $\delta = 0.2$ (top) and $\delta = 0.8$ (bottom)

and deviating themselves. Hence, as in the benchmark model, from the incumbent's point of view, imperfect commitment can be superior to perfect commitment.

To demonstrate the possible outcomes, we again use a numerical example. The voters' utility function is $u = \gamma \ln(y_i - t_i) + (1-\gamma)\ln G$, which implies that the politician in power determines the public good's supply such that $G(t_1, t_2, \kappa_k) = n(t_1 + t_2)(1-\gamma)\delta/[2(1-\gamma\delta)\kappa_k]$. If the politician deviates at the policy level, he or she chooses tax rates $\tilde{t}_i^i = \max[0, y(1-\gamma\delta) - \bar{t}\gamma\delta]$ and $\tilde{t}_j^i = \bar{t}$, $i = 1, 2$ and $j \neq i$. The parameter values in the numerical example are $n = 5$, $y = 2$, $\gamma = 0.6$, $C = 0.15$, $\kappa_l = 0.75$, $\kappa_h = 1.25$ and $q_l = 1 - q_h = 0.5$. Figure 5 shows the expected utility of the politician in charge at the constitutional level for $\delta = 0.2$ and $\delta = 0.8$, respectively. In any case, the incumbent sets the tax rates that induce only one politician to deviate.

References

Aghion, P., & Bolton, P. (1990). Government debt and the risk of default: a political-economic model of the strategic role of debt. In R. Dornbusch & M. Draghi (Eds.), *Public debt management: Theory and history* (pp. 315–345). Cambridge: Cambridge University Press.

Aragonès, E., Castanheira, M., & Giani, M. (2015). Electoral competition through issue selection. *American Journal of Political Science*, *59*, 71–90.

Barro, R. J., & Gordon, D. B. (1983). Rules, discretion and reputation in a model of monetary policy. *Journal of Monetary Economics*, *12*(1), 101–121.

Besley, T., & Coate, S. (1997). An economic model of representative democracy. *Quarterly Journal of Economics*, *112*, 85–114.

Betz, T. (2018). The electoral costs of policy commitments. *Political Science Research and Methods*. https://doi.org/10.1017/psrm.2018.27.
Canes-Wrone, B., & Shotts, K. W. (2007). When do elections encourage ideological rigidity? *American Political Science Review*, *101*(2), 273–288.
Chen, Y., & Eraslan, H. (2017). Dynamic agenda setting. *American Economic Journal: Microeconomics*, *9*(2), 1–32.
Crain, W. M. (2001). Institutions, durability, and the value of political transactions. In W. F. Shughart II & L. Razzolini (Eds.), *The elgar companion to public choice, chapter 8* (1st ed., pp. 183–196). Cheltenham: Edward Elgar Publishing.
Crain, W. M., Shughart, W. F, I. I., & Tollison, R. D. (1988). Legislative majorities as nonsalvageable assets. *Southern Economic Journal*, *55*(2), 303–314.
Crain, W. M., & Sullivan, J. T. (1997). Committee characteristics and re-election margins: An empirical investigation of the US house. *Public Choice*, *93*(3), 271–285.
Crain, W. M., & Tollison, R. D. (1979). Constitutional change in an interest-group perspective. *Journal of Legal Studies*, *8*(1), 165–175.
de Figueiredo, Jr, R. J. P. (2002). Electoral competition, political uncertainty, and policy insulation. *American Political Science Review*, *96*(2), 321–335.
de Figueiredo, Jr., R. J. P. (2003). Budget institutions and political insulation. *Journal of Public Economics*, *87*(12), 2677–2701.
Dellis, A. (2009). The salient issue of issue salience. *Journal of Public Economic Theory*, *11*, 203–231.
Dragu, T., & Fan, X. (2016). An agenda-setting theory of electoral competition. *Journal of Politics*, *78*, 1117–1183.
Edwards, J., & Keen, M. (1996). Tax competition and Leviathan. *European Economic Review*, *40*, 113–134.
Glazer, A., & Lohmann, S. (1999). Setting the agenda: Electoral competition, commitment of policy, and issue salience. *Public Choice*, *99*, 377–394.
Hanssen, F. A. (2004). Is there a politically optimal level of judicial independence. *American Economic Review*, *94*, 712–729.
Kydland, F. E., & Prescott, E. C. (1977). Rules rather than discretion: The inconsistency of optimal plans. *Journal of Political Economy*, *85*(3), 473–492.
Laibson, D. (1997). Golden eggs and hyperbolic discounting. *Quarterly Journal of Economics*, *112*, 443–477.
Milesi-Ferretti, G. M. (1995). The disadvantage of tying their hands: On the political economy of policy commitments. *Economic Journal*, *105*, 1381–1402.
Osborne, M. J., & Slivinski, A. (1996). A model of political competition with citizen candidates. *Quarterly Journal of Economics*, *111*, 65–96.
Pani, M., & Perroni, C. (1999). Time-inconsistent candidates vs. time-inconsistent voters: Imperfect policy commitment in political equilibrium. Working paper, University of Warwick.
Persson, T., & Svensson, L. E. O. (1989). Why a stubborn conservative would run a deficit: Policy with time inconsistent preferences. *Quarterly Journal of Economics*, *I04*, 325–345.
Persson, T., & Tabellini, G. (2000). *Political economics: Explaining economic policy*. Cambridge: MIT Press.
Rogoff, K. (1985). The optimal degree of commitment to an intermediate target. *Quarterly Journal of Economics*, *100*, 1169–1189.
Romer, T., & Rosenthal, H. (1978). Political resource allocation, controlled agendas, and the status quo. *Public Choice*, *33*, 27–43.
Saint-Paul, G., Ticchi, D., & Vindigni, A. (2016). A theory of political entrenchment. *Economic Journal*, *126*, 1238–1263.