

# Unanimity Rule Constitutions

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## Abstract

In this paper, we show that the shortcomings of the unanimity rule can be alleviated by complementing it with the following constitutional principles: broad packages with many public projects can only be proposed once in a legislative term, the agenda setter needs to pay the highest taxes he is proposing, as well as a ban on subsidies. We show that such democratic constitutions yield efficient public project provision.

**Keywords:** Unanimity rule, incomplete social contract, constitutional treatment rules, provision of public projects.

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# 1 Introduction

The unanimity rule ensures that only Pareto optimal changes are adopted in a society. However, the veto power of each individual under the unanimity rule creates large compensation requirements for losers of public projects. If redistribution is costly because of distortionary taxation, winners of public projects may find it too costly to overcome the losers' vested interests and socially valuable projects will not be undertaken. Therefore, the unanimity rule leads to an undersupply of socially efficient projects and is rarely applied in practice. In this paper, we show that appropriate constitutional rules supplementing the unanimity rule can eliminate the undersupply problem while, at the same time, preserving the virtue of the unanimity rule in allowing only Pareto optimal changes.

The essential idea is to allow a single voting about a broad package of public projects about which the society decides by the unanimity rule. If the package is rejected, only voting about single projects is allowed. The advantage of a package is that losers from particular public projects can be compensated by a lower overall tax burden such that they still benefit from the package. Thus, direct subsidization of project losers can be avoided which increases social efficiency when taxation is distortionary. However, it is important that a broad package of public projects can only be proposed once in a legislative term in order to limit individuals' veto power and thus reduce their incentive to behave strategically. After a package has been rejected, only single public projects can be proposed and voted on by the unanimity rule. This creates incentives for all individuals to propose packages in the first place that are acceptable for the whole society.

We establish the rules, which enable the unanimity rule to be used in a socially efficient way, from a constitutional perspective. Citizens decide under a veil of ignorance about their benefits from public projects how public project provision and financing should be governed in legislative periods.<sup>1</sup> The constitutional principles a society can adopt must fulfill the fundamental democratic principles of equal voting and agenda rights. Moreover, constitutional principles cannot require more messages or information from citizens than proposals or voting including the possibility of non-participation. Thus, democratic constitutions are understood as the liberal democracy constraint on the set of all feasible mechanisms to collectively provide public projects.

Our interest is the potential of the unanimity rule to reach first-best allocations.

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<sup>1</sup>The advantage of the veil of ignorance on the constitutional level is that it allows citizens to agree unanimously on socially efficient decision rules. If, however, the veil of ignorance is incomplete and individuals differ ex-ante with respect to some characteristics, it can be better for all to have still more information in the constitutional stage. See Müller (1998) for a discussion of this topic.

We show that in order to reach a first-best allocation, the unanimity rule must be supplemented by the following three constitutional rules:

- Amendment rule: If an initial proposal, which might include a whole package of public projects, has been rejected, a second proposal can be made with the restriction that only one single public project may be proposed;
- Maximal taxation of the agenda setter, i.e. the agenda setter has to pay the highest taxes he is proposing;
- A ban on subsidies.

The ban on subsidies eliminates all subsidies and thus losers can only be compensated by lowering their tax burden in a package of public projects where they benefit from some and lose from other projects. The amendment rule ensures that only socially efficient packages are proposed and that strategic voting is eliminated because packages can only be proposed once. Maximal taxation of agenda setters ensures that only agents that strongly benefit from a package apply for agenda setting. Our work complements the important insights of Romer and Rosenthal (1983) who have shown that constitutions with an unanimity rule, an agenda setting rule and a reversion rule if a proposal is rejected are optimal for asymmetric externality problems. In our context, the problem is to avoid socially undesirable tax distortions while at the same time ensuring that a project is undertaken if and only if it is socially efficient.

Our investigation is motivated by a large literature on the virtues and vices of the unanimity rule.<sup>2</sup> Wicksell (1896) was the first to link the potential for all to benefit from collective action to the unanimity rule. The unanimity rule is the only voting rule that always leads to Pareto-efficient public good quantities and tax schemes, as recognized by Wicksell (1896)<sup>3</sup> and in the classic contribution of Buchanan and Tullock (1962) (see Mueller (1995) for a comprehensive survey). Three main criticisms have been made against the unanimity rule.<sup>4</sup>

First, searching for a Pareto efficient allocation might take considerable time, particularly in large communities with diverse interests. The time required to define an issue and to discover a set of Pareto-optimal tax shares may be considerable. This may outweigh the gains of those agents who are saved from paying taxes exceeding their benefits from a public project.

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<sup>2</sup>See Buchanan (1991) and Mueller (1996) for general surveys on constitutional political economy

<sup>3</sup>Also, the famous Lindahl equilibrium (Lindahl 1919) could be reached under the unanimity rule.

<sup>4</sup>Buchanan and Tullock (1962) identify such disadvantages as external costs of decision-making (see also Breton (1974)).

Second, the unanimity rule invites strategic behavior: an individual strategically vetoes a proposal in order to seek a greater share of the gains from collective action ( see Black (1965), Buchanan and Tullock (1962), Barry (1965), Samuelson (1969)). Because of these objections, even those most favorably disposed towards the unanimity rule, such as Wicksell and Buchanan and Tullock, have argued to abandon this rule.

A third objection against the unanimity rule occurs when a society decides about a public project which hurts a part of the population. When redistribution is costly because e.g. taxation is distorting or because of a free rider problem in vote trading, compensation of losses might be too expensive. Therefore a public project might not be adopted under the unanimity rule, even if it is socially efficient from an ex-ante or utilitarian perspective to undertake the project. This can lead to a bias in favor of the status quo (see Mueller (1995) and Guttman (1998)).

In our paper, we show that the second and the third objection can be overcome by supplementing the unanimity rule with the following constitutional rules: broad packages of public project can only be proposed once, maximal taxation of the agenda setter and a ban on subsidies. These constitutional rules preserve the virtues of the unanimity rule and can eliminate its disadvantages.<sup>5</sup>

While we are not aware of real world constitutions which exactly match the constitution suggested in this paper, there are examples that exhibit some similarities. The German legislation has been characterized over the last years by a first chamber (Bundestag) dominated by the winners of the federal elections. The opposition won the majority of state elections and had a blocking majority in the second chamber (Bundesrat), which represents the states. For large packages, which needed the support of both chambers, such as an overhaul of the tax code, the constellation led to a de facto unanimity requirement to change the status quo.

This divided government feature in Germany was also present in the United States where the legislature was dominated by the Republican party while the executive branch has been taken by the Democrats. Divided governments can lead to de facto unanimity or almost unanimity rules.<sup>6</sup> Our analysis suggests that the unanimity feature of divided governments can be beneficial because agenda setters will need to propose broad packages acceptable to almost everybody to induce a change of the

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<sup>5</sup>Guttman (1998) examines a model with a committee that decides on a set of proposals. Exclusion of redistribution among committee members is justified by the free-rider problem that arises when a reasonable sized group of proponents of a proposal has to provide the resources to bribe the other side. In our context this problem does not occur because the agenda setter can observe the utilities of the other citizens and can endogenously determine a proposal by setting the tax scheme. In a broad package of proposals redistribution takes place through the tax scheme.

<sup>6</sup>Other justifications why a society may want to allow for divided governments have been provided in the innovative work of Alesina and Rosenthal (1995).

status quo.

The paper is organized as follows. In the next section we present the model and describe all socially efficient allocations. In section 3 we present our unanimity rule constitution and show that it always leads to socially efficient solutions. Section 4 concludes.

## 2 Model and Treatment Rules

### 2.1 Model

The basic structure of our model builds on Romer and Rosenthal (1983) and Aghion and Bolton (1998) and on Erlenmaier and Gersbach (1999) in particular. We consider a standard social choice problem of public project provision and financing. Time is indexed by  $t = 0, 1$ . The first period  $t = 0$  is the constitutional period. In the constitutional period, a society of risk-neutral members decides how public project provision and financing should be governed in the legislative period.

In the legislative period  $t = 1$ , each citizen is endowed with some private consumption good whose density on the unit interval is  $e$ . The community can adopt two public projects  $P_1$  and  $P_2$  with per capita costs  $k_1 > 0$  and  $k_2 > 0$  respectively. Citizens are indexed by  $i$  or  $j \in [0, 1]$  and we denote by  $v_{l,j}$  the utility of agent  $j$  from provision of the public project  $P_l$  (expressed in terms of the the consumption good) ( $l = 1, 2$ ). We assume that  $P_1$  benefits all citizens and - for simplicity of presentation - that the utility from  $P_1$  is identical for all citizens:  $v_{1,j} = V_1$  for all  $j \in [0, 1]$ . Moreover, we suppose that  $v_{2,j} = V_{2,h}$  for  $j \in (q_{h-1}, q_h]$  ( $h = 1, \dots, n$ ) where  $0 = q_0 < q_1 < \dots < q_n = 1$  and  $V_{2,1} < V_{2,2} < \dots < V_{2,n}$ . We call citizens with a nonnegative utility from  $P_2$  *project winners* and the other citizens *project losers*. At  $t = 0$ , agents do not know what their utility from the public project will be, i.e. for each citizen his location  $j$  on the unit interval is a uniformly distributed random variable. Moreover, we assume that those random variables are independent and hence, by the law of the large numbers, the fraction of agents with utility  $V_{2,h}$  from the public project in the legislative stage will be equal to  $p_h := q_h - q_{h-1}$ .

Public projects must be financed by taxes. We assume that taxation is distortionary. Let  $\lambda > 0$  denote the shadow cost of public funds. That is, taxation uses  $(1 + \lambda)$  of taxpayers' resources in order to levy 1 for public projects or for transfers to citizens. Hence the overall per capita costs of the public projects amount to  $(1 + \lambda)k_1$  and  $(1 + \lambda)k_2$  respectively. We denote the tax payment by  $t_j$  and the subsidy of citizen  $j$  by  $s_j$  and define the variables  $g_l$  ( $l = 1, 2$ ) that indicate whether the public project  $P_l$  is provided ( $g_l = 1$ ) or not ( $g_l = 0$ ). Assuming that  $v_{l,j}$  is a private benefit that

cannot be taxed,<sup>7</sup> the utility of citizen  $j$  in the legislative period is given by

$$e + g_1 V_1 + g_2 v_{2,j} - t_j + s_j.$$

Finally, the budget constraint of the society in the legislative period is given by

$$\int_0^1 t_j dj = (1 + \lambda) \left[ g_1 k_1 + g_2 k_2 + \int_0^1 s_j dj \right].$$

We assume throughout the paper that the provision of  $P_1$  is socially efficient:  $V_1 > (1 + \lambda)k_1$  and that  $P_1$  is big compared to  $P_2$ :  $V_1 \geq -V_{2,1}$ .

## 2.2 Socially Efficient Solutions

The fact that citizens are risk neutral implies that it is socially efficient from an ex ante point of view to provide  $P_1$  and to provide  $P_2$  if and only if expected benefits are larger than per per capita costs, i.e.

$$V_2 := \sum_{k=1}^n p_k V_{2,k} > (1 + \lambda)k_2.$$

Moreover, taxes should only be raised to finance the public projects. Any redistribution activities are waste from an ex ante point of view. We summarize the first-best solution as follows.

### Proposition 1

*Any allocation where  $P_1$  is provided, where  $P_2$  is provided if and only if  $V_2 > (1 + \lambda)k_2$  and where taxes are only raised to finance the public projects is socially efficient (first -best) in an ex-ante sense.*

In the following we assume that complete social contracts cannot be written at the constitutional stage. As it is usual in the incomplete contracting literature, we assume that future states of nature cannot be described precisely and therefore a constitution can only specify rules for future social decision making. However, utilities are observable for individuals at the time when the agenda is set. While this assumption is not realistic in all cases, it seems to be a plausible approximation for quite a large range of potential public projects (e.g.: the construction of roads, labor market reforms or the scale-down of the defense industry). As we will show, the unanimity rule supplemented by appropriate constitutional rules will lead to efficient public project provision.

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<sup>7</sup>If  $v_j$  is a monetary return it could be taxed in addition to  $e$ . The results would be unaffected by this modification.

## 2.3 The Game

We consider the duality of constitutional and legislative period as a substitute for the complete social contract that cannot be written. At the constitutional stage, the society decides about the rules governing the legislative processes. The legislative process may be repeated once. We use the index  $\tau$  in order to indicate whether we are referring to the initial round of legislation ( $\tau = 1$ ) or to the repetition ( $\tau = 2$ ). The sequence of events for a decision process in this context is summarized as follows:

- Stage 1: In the constitutional period, the society decides unanimously about the constitutional principles which govern legislative decision making.
- Stage 2: At the start of the legislative period, citizens observe their location  $j$  on the unit interval and the location of all other agents. Citizens decide simultaneously whether to apply for agenda setting ( $\psi_{\tau,j} = 1$ ) or not ( $\psi_{\tau,j} = 0$ ).
- Stage 3: Among all citizens that apply one citizen  $a \in [0, 1]$  is determined randomly to set the agenda. The agenda setter proposes a project/financing package  $\left( g_1, g_2, t_j, s_j \right)_{j \in [0,1]}$ . Denote this choice by  $A_{\tau,a}$ .
- Stage 4: Given  $A_{\tau,a}$ , citizens decide simultaneously whether to accept the proposal ( $\delta_{\tau,j}(A_{\tau,a}) = 1$ ) or not ( $\delta_{\tau,j}(A_{\tau,a}) = 0$ ).
- Stage 5: Repetition of stages 2 - 4 if the initial proposal has not been adopted or if nobody has applied for agenda setting. Only one repetition is possible.

We denote stages 2 -4 and the (potential) repetition as the *legislative process*. Note that if nobody applies for agenda setting in the initial round, there still will be a repetition. If nobody applies in the repetition as well, the status quo prevails. Moreover, at the voting stage individuals know who will be taxed and who will receive subsidies if a proposal is accepted, since taxes and subsidies are personalized. Given a constitution with a set of principles discussed in the next section, we look at subgame perfect implementations in stages 2 to 5. A comprehensive overview of the implementation issues can be found in Moore (1992). An equilibrium for the subgame that consists of the stages 2 -5 can be described as a set of strategies

$$\left\{ \psi_{\tau}, A_{\tau}, \delta_{\tau}(\cdot) \right\}_{\tau=1,2}$$

where  $\psi_{\tau} = (\psi_{\tau,j})_{j \in [0,1]}$ ,  $A_{\tau} = (A_{\tau,a})_{a \in [0,1]}$ ,  $\delta_{\tau} = (\delta_{\tau,j})_{j \in [0,1]}$  and  $\delta_{\tau,j} = \delta_j(A_{\tau,a})$  depends on the proposed agenda  $A_{\tau,a}$ . For the voting game in stage 4 and for the decision about applying for agenda setting (stage 2) we will assume that

- **(EWS)** *Agents eliminate weakly dominated strategies.*

EWS is a standard assumption to eliminate the multiplicity of voting equilibria. Suppose now that equilibrium voting strategies in the repetition of the legislative process are unique and that the utility  $U_{2,j,a}$  which is achieved by agent  $j$  if agent  $a$  sets the agenda in the repetition, does not depend on  $a$ :  $U_{2,j,a} = U_{2,j}$  (as will be the case for the constitution that we will investigate).<sup>8</sup> In this case we can define the utility payoff  $U_j(A_{1,a}, \Delta_{1,j}, \delta_{1,j})$  of agent  $j$ , given agent  $a$  has made the initial proposal  $A_{1,a}$  and given the votes  $\Delta_{1,j} = (\delta_{1,i})_{i \in [0,1]; i \neq j}$  of all other citizens and his own vote  $(\delta_{1,j})$  in the initial round of legislation. In order to simplify the exposition, we assume that two tie-breaking rules are applied:

- **(T1)** *Suppose that agent  $a$  has made the initial proposal  $A_{1,a}$ . If*

$$U_j(A_{1,a}, \Delta_{1,j}, 1) = U_j(A_{1,a}, \Delta_{1,j}, 0)$$

*for all possible votes  $\Delta_{1,j}$  of the other agents, then agent  $j$  will vote against the proposal if his net benefit  $u_{1,j} := g_1 V_1 + g_2 v_{2,j} + s_j - t_j$  from the proposal is smaller than  $U_{2,j}$  and he will vote yes in all other cases.*

In order to formulate the second tie-breaking rule, we additionally assume that the voting strategies  $\delta_1(\cdot)$  are unique if (T1) is applied. In this case, we can define the utility level  $U_j(A_{1,a})$  that an agent  $j$  will achieve if agent  $a$  has proposed the agenda  $A_{1,a}$  in the initial stage of the legislative process. Denoting the set of all possible agendas by  $\mathcal{A}$  we are now ready to formulate the second tie-breaking rule:

- **(T2)** *If an agent  $j$  cannot strictly improve his utility by setting the agenda, i.e. if*

$$\sup_{A_{1,j} \in \mathcal{A}} U_j(A_{1,j}) \leq \min \left\{ e, \inf_{a \in [0,1], a \neq j, A_{1,a} \in \mathcal{A}} U_j(A_{1,a}) \right\}$$

*he will not apply for agenda setting.*

In what follows we will - without referring explicitly to it - always assume that (EWS), (T1) and (T2) are applied. We are now ready to characterize the expected utility level that a particular constitution can deliver. We say that a constitution  $\mathcal{C}$  implements an expected utility  $U$  if, given agents have agreed on  $\mathcal{C}$  in stage 1, the following holds: If (EWS), (T1) and (T2) are applied, all possible subgame perfect equilibria under the constitution  $\mathcal{C}$  yield a fixed expected utility  $U$ . Non-uniqueness of equilibria only occurs in out-of-equilibrium strategies. A formalization

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<sup>8</sup>Otherwise we would need to work with the expected utility of all realizations  $U_{2,j,a}$ .

of this implementation requirement is that for the unique equilibrium strategies  $\{\psi_\tau^*, A_\tau^*, \delta_\tau^*\}_{\tau=1,2}$  the payoff

$$\bar{U} = \int_0^1 1\{\psi_{1,a}^* = 1\} \int_0^1 U_j(A_{1,a}^*) dj da$$

that is expected in  $t = 0$  equals  $U$ . We call a constitution *first-best* if it implements the expected utility  $\bar{U}_{opt}$  that is induced by the socially efficient contract, namely

$$\bar{U}_{opt} = \begin{cases} e + V_1 + V_2 - (1 + \lambda)(k_1 + k_2) & \text{if } V_2 > (1 + \lambda)k_2 \\ e + V_1 - (1 + \lambda)k_1 & \text{else.} \end{cases}$$

## 2.4 Constitutional Principles

In this section we introduce the constitutional rules that are at the disposition of the society. The rules in the constitution have to specify

1. Restrictions on the agendas that can be proposed, i.e. definition of all agendas that are constitutional (**Agenda rules**). An agenda consists of a project proposal and a financing package.
2. How the nation decides about a proposal (**Decision rules**).

As noted above, any rules in a constitution must satisfy the liberal principles of democracies: They should not require more messages or information from citizens than proposals or voting and they should include equal voting and agenda setting rights. We will consider the following possibilities to design constitutional rules:

### Agenda Rules

- *Maximal taxation of agenda setter* [**MTA**]  
The agenda setter has to pay the maximal tax rate that is proposed in his agenda.
- *No subsidies* [**NS**]  
The agenda setter is not allowed to propose any subsidies.
- The financing package must satisfy the budget constraint.

### Decision Rules

- *Unanimity Rule* [**UA**]  
A proposal to change the status quo is only adopted if all citizens vote for the proposal.

- *Amendment Rule* [AM]

If the initial proposal has been rejected, the legislative process (stages 2 - 4 of the sequence of events) is repeated with the restriction, that in the repetition, a constitutional agenda may only propose one single public project (i.e.  $P_1$  or  $P_2$ ) but not both of them.<sup>9</sup>

### 3 First-best Constitutions

In this section we will - as noted above - assume that citizens can identify each others utility levels  $V_1$  and  $v_{2,j}$  and the costs  $(1 + \lambda)k_l$  of both public projects ( $l = 1, 2; j \in [0, 1]$ ) in the legislative period. But while these data are *observable*, we assume that they are not *verifiable* in front of a constitutional court. We explore how the following set of constitutional principles can yield a first-best allocation:

$$\mathcal{C}^* := \left\{ [\text{UA}], [\text{AM}], [\text{MTA}], [\text{NS}] \right\}.$$

In particular we will prove that

1. A unique subgame perfect equilibrium exists. Denote the respective equilibrium strategies by  $\left( \psi_\tau^*, A_\tau^*, \delta_\tau^* \right)_{\tau=1,2}$ .
2. If  $V_2 > (1 + \lambda)k$ , then there are  $a \in [0, 1]$  with  $\psi_{1,a}^* = 1$ . For all such  $a$ ,  $A_a^* = A_{I^*}$  where  $A_{I^*}$  is an agenda that proposes the provision of both projects financed by taxes that are adjusted to the different utility levels from the second project. More formally:

$$A_{I^*} = \left( g_1 = 1, g_2 = 1, t_j = t_j^*, s_j = s = 0 \right)_{j \in [0,1]}$$

where  $t_j^* = \min \left\{ (1 + \lambda)k_1 + V_{2,j}, \bar{t} \right\}$  and<sup>10</sup>

$$\bar{t} := \min \left\{ t \mid \sum_{h=1}^n \min \left\{ (1 + \lambda)k_1 + V_{2,h}, t \right\} = (1 + \lambda)(k_1 + k_2) \right\}.$$

Moreover,  $\delta_{1,j}^*(A_{I^*}) = 1$  for all  $j \in [0, 1]$  and hence no repetition of the legislative process is conducted.

3. If  $V_2 - (1 + \lambda)k_2 \leq 0$ , then nobody will apply for agenda setting in the initial

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<sup>9</sup>Note that if the initial and the second proposal have been rejected, no further proposals are possible.

<sup>10</sup>Note that  $\int_0^1 t_j^* dj = (1 + \lambda)(k_1 + k_2)$ .

stage, i.e.  $\psi_{1,j}^* = 0$  for all  $j$ , but all agents apply in the second stage ( $\psi_{2,j}^* = 1$  for all  $j$ ) and propose  $A_{R^*}$  ( $A_{2,a}^* = A_{R^*}$  for all  $a$ ) where

$$A_{R^*} = \left( g_1 = 1, g_2 = 0, t_j = t = (1 + \lambda)k_1, s_j = s = 0 \right)_{j \in [0,1]} .$$

We begin our analysis describing the equilibria that occur when the legislative process is repeated:

**Lemma 1**

*Equilibrium strategies in the repetition of the legislative process are unique under the constitution  $\mathcal{C}^*$ . They are given by  $(\psi_2^*, A_2^*, \delta_2^*)$  where  $\psi_{2,j}^* = 1$ ,  $A_{2,j}^* = A_{R^*}$  and  $\delta_{2,j}^*(A_{R^*}) = 1$  for all  $j \in [0, 1]$ . The resulting utility for all citizens is therefore given by*

$$U^* := e + V_1 - (1 + \lambda)k_1.$$

**Proof.**

First of all note that because of (EWS) and [UA] the voting strategy of agent  $j$  is unique if  $u_j \neq 0$  where

$$u_j := g_1 V_1 + g_2 v_{2,j} - t_j + s_j.$$

Voting no when the proposal  $A_{R^*}$  has been made, is strictly dominated by voting yes if  $u_j > 0$  and vice versa if  $u_j < 0$ . Hence, agenda  $A_{R^*}$  will be accepted. Moreover, the following considerations show that there is no other agenda with which the agenda setter could achieve  $U^*$  or a higher utility level: In order to achieve an utility of at least  $U^*$ , the agenda setter has to make a constitutional proposal that will be adopted. But such a proposal involves either  $g_1 = 0$  or  $g_2 = 0$  because of the amendment rule. If  $g_1 = 0$  and  $g_2 = 0$ , the agenda setter achieves a utility payoff that is not higher than  $e < U^*$  because of [NS]. If  $g_1 = 0$  and  $g_2 = 1$ , project losers will vote no (because of [NS]) and thus no project will be undertaken. If finally  $g_1 = 1$  and  $g_2 = 0$ , then  $A_{R^*}$  minimizes the tax burden of the agenda setter which implies that  $A_{R^*}$  maximizes his utility.

□

Lemma 1 implies that if the initial proposal is unconstitutional or will be rejected, the resulting utility level for all citizens will be  $U^*$ . Hence an initial proposal that shall be accepted cannot produce lower utility levels for any individual, since otherwise an agent would exercise his veto power under the unanimity rule. Moreover,

we observe that the project  $P_1$  that benefits all citizens will always be provided and that project  $P_2$  will never be provided in the repetition. Hence, in order to prove that our constitution is first-best, it remains to show that if  $V_2 > (1 + \lambda)k_2$ , then the projects  $P_1$  and  $P_2$  are provided in the initial legislative process and that if  $V_2 \leq (1 + \lambda)k_2$ , nobody will apply in the initial stage of the legislative process. Our main result is:

**Proposition 2**

*The constitution  $\mathcal{C}^*$  is first-best.*

**Proof.**

First note that by (EWS) and (T1) and the uniqueness of equilibrium strategies in the repetition according to lemma 1, voting strategies  $\delta_1^*(\cdot)$  are unique in equilibrium:  $\delta_{1,j}^*(A_{1,a}) = 0$  if the net benefit  $u_j$  of the  $A_{1,a}$  for citizen  $j$  is lower than  $U^*$  and  $\delta_{1,j}^*(A_{1,a}) = 1$  else. Moreover, because of [UA],

$$\inf_{a \in [0,1], A_{1,a} \in \mathcal{A}} U_j(A_{1,a}) \geq U^*.$$

Hence citizens will only apply for agenda setting if there are agendas that produce a higher utility than  $U^*$  for them. By the same reasoning as in lemma 1, the agenda  $A_{R^*}$  produces the highest utility level for the agenda setter under all agendas that do not propose  $g_1 = 1$  and  $g_2 = 1$ , namely  $U^*$ . Therefore agents will only apply for agenda setting if there is a constitutional proposal with  $g_1 = g_2 = 1$  that will be adopted. Consider such a proposal. If it shall be adopted, the tax rate for a citizen  $j$  cannot be higher than  $(1 + \lambda)k_1 + v_{2,j}$ . Otherwise he would exert his veto power. Because of [MTA] and [NS] the agenda setter maximizes his own utility (minimizes his tax burden) by proposing the tax rate  $t_j^*$  for agent  $j$ . Moreover, in order to make a constitutional proposal, the tax rate for the agenda setter himself cannot be lower than

$$t_a^* = \min \left\{ (1 + \lambda)k_1 + V_{2,n}, \bar{t} \right\}.$$

Hence, overall tax revenues are bounded from above by  $(1 + \lambda)k_1 + V_2$ . If  $V_2 < (1 + \lambda)k_2$  then, obviously, the budget constraint cannot be fulfilled. If  $V_2 = (1 + \lambda)k_2$  then  $t_a^* = (1 + \lambda)k_1 + V_{2,n}$ , which implies that the resulting utility for the agenda setter is limited from above by  $U^*$ . Therefore, if  $V_2 \leq (1 + \lambda)k_2$ , then by (T2) nobody would apply for agenda setting in the initial stage:  $\psi_{1,j}^* = 0$  for all  $j$ . If, on the other hand,  $V_2 > (1 + \lambda)k_2$ , agents with  $v_{2,j} \leq \bar{t} - (1 + \lambda)k_1$  will not apply for agenda setting, since they cannot achieve a higher utility than  $U^*$ . Consider, on the

other hand, agents with  $v_{2,j} > \bar{t} - (1 + \lambda)k_1$ .<sup>11</sup> For such agents, proposing  $A_{I^*}$  is the utility maximizing agenda since their resulting utility is higher than  $U^*$ . Also  $A_{I^*}$  implies the lowest tax level for the agenda setter under all constitutional proposals with  $g_1 = g_2 = 1$  that will be adopted. Hence, applying for agenda setting in the initial stage of the legislative process weakly dominates not applying for agents  $j$  with  $v_{2,j} > \bar{t} - (1 + \lambda)k_1$ .<sup>12</sup> This observation completes the proof.

□

The proof illustrates how  $\mathcal{C}^*$  works and achieves a first-best allocation: The amendment rule guarantees that the first project  $P_1$  which benefits all citizens is always implemented in the second stage: If it comes to this stage, agenda  $A_{I^*}$  which proposes the provision of  $P_1$  and an uniform tax rate of  $(1 + \lambda)k_1$  for all citizens is implemented. If the second project  $P_2$  shall be provided, it has to be proposed in the first legislative stage. Moreover, an agenda setter that wants to implement  $P_2$  has to compensate losers from  $P_2$  by tax cuts with respect to  $A_{I^*}$  in order to satisfy the [UA]. Since subsidies are forbidden, the agenda setter needs to include the provision of  $P_1$ . If it is socially efficient to provide  $P_2$ , then winners will agree to finance the tax cuts for losers since their utility from  $P_2$  is sufficiently high. If, on the other hand, the provision of  $P_2$  is not socially valuable then, given an arbitrary constitutional agenda  $A$  that includes  $P_2$ , there will be a positive measure of citizens that prefer  $A_{I^*}$  to  $A$  and hence will vote against  $A$ .

## 4 Conclusion

In this paper, we have argued that two of the chief objections against the unanimity rule - strategic behavior and costly redistribution - can be overcome if the rule is supplemented by appropriate constitutional rules. In particular, allowing agenda setters to propose broad packages of public projects induces them to tax losers of particular projects less in order to gain their support. Since such broad packages can only be proposed once, strategic hold-up voting is eliminated. The virtues of the unanimity rule can be preserved while its disadvantages are eliminated.

In applications, a number of issues will have to be considered in order to bring the unanimity rule constitution to work. First, a fully fledged constitution must determine the frequency with which broad packages can be proposed. For instance,

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<sup>11</sup>Obviously, at least for agents in  $(q_{n-1}, 1]$  this condition is fulfilled if  $V_2 > (1 + \lambda)k_2$ .

<sup>12</sup>Since all potential agenda setters will propose  $A_{I^*}$ , such agents are never worse off by applying than by not applying, but, given nobody else applies,  $\psi_{1,j} = 1$  is strictly better than  $\psi_{1,j} = 0$  for such agents  $j$ .

one could allow one broad package within a legislative term. Second, the unanimity rule may be too strict because an individual voting mistake or individual preference for strategic hold-up voting could have large economic costs. Therefore, it might be better to select super majority rules with majority requirements of 90% or 95% yes-votes in order to change the status quo. Moreover, we could envision a two-tier constitution in which a society or a legislature decides by unanimity or a super majority rule once, in a particular time frame about a broad package. If the package proposal is defeated, single proposals only need a simple majority rule to be adopted. While such a two-tier system might not preserve efficiency under all circumstances, it might be more suited for practical applications.

These and other issues are relevant when unanimity rule constitutions are brought to work in political processes. The current analysis suggests that there is a potential for societies, to rely on the virtues of the unanimity rule by complementing it with additional constitutional rules.

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