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Constitutional Conservatism and Resistance to Reform*

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Abstract

We analyze an overlapping generations model of voting over "reform projects". These resemble investments in that they first require some investment expenditure and later bring a payoff; consequently, older people are more conservative (against reforms) than younger ones.

We show that if people vote about a constitution (which is a rule what majority is required in an election for a reform to take place), the constitution will require more than a simple majority. Moreover, from an intuitive social point of view, the equilibrium constitution is too conservative.

Keywords: Constitution, conservatism, overlapping generations, political economy.
JEL code: D72.

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1 Introduction

The median voter model is probably one of the most influential models in political economy. In particular, at least the simple version of the median voter model implies that a change of the status quo (a "reform") will be taken if and only if it increases the utility of the median voter. The simple majority rule assumed in the median voter model has also the advantage of being intuitively appealing as democratic.[1] However, in the real world, we observe that there are certain rules which make legislative changes more difficult than under a simple majority rule; this is usually specified in a constitution.

The most prominent example is probably a change of the constitution itself, which in most countries requires a special majority in the parliament(s) or a majority in the parliament *and* a majority in a plebiscite. In parliamentary systems with a strong committee organization, a legislative proposal usually needs the support of *both* the respective committee and the house. In parliamentary systems with two chambers, certain legislative proposals need the support of both chambers. While there may be specific arguments for each of these rules, they lead to the common effect that they make changes of the status quo more difficult to achieve.[2]

Given that the simple majority rule is so appealing, systems which require more than simple majority for a change to take place have to be explained. Our model presents a simple rationale for constitutions requiring qualified majorities in elections. We analyze an overlapping generations model of voting over reform proposals. We model reform opportunities as similar to investment opportunities: At first, there is a cost and then there are payoffs. If voters have a finite lifetime, there will always be some old voters who are worse off if the reform is undertaken: They are alive at the time the costs accrue, but they do not live long enough to reap the benefits. Think of the reform in the formerly communist countries of eastern Europe. Initially, the transition probably had (and perhaps still has) large costs in terms of a lower income for most people, but eventually, income in these countries will be higher than it would have been under communist rule. Hence the present value of human capital has probably increased for young people as a consequence of the reform, but older people just suffer from the present phase of adjustment difficulties without being able to reap the benefits of reform since they will be dead when they accrue. It is hence not surprising that the supporters of the communist parties (which are conservative in the sense that they want to stop or at least slow down the reform process) in the reform countries of middle and

[1] It can also be justified axiomatically, as shown by May (1952).

[2] Tullock (1998), p.216, estimates that legislative rules in the US for changing the status quo are "roughly equivalent to requiring a 60% majority in a single house elected by proportional representation."

eastern Europe are predominantly found among older people while the majority of young people are in favor of the reforms.

If there is just a simple majority vote over a specific reform project in our model, the reform will be taken if the median voter benefits from this project. The median voter is the person of average age, since net benefits from the reform project decrease with age. Imagine now however that there is no vote about a specific reform proposal, but rather about a constitution which determines the share of votes which are necessary in an election in order for a reform. In this case, the median voter will vote for a more conservative constitution: He knows that if a reform proposals comes up for election right now, a simple majority rule is optimal for him, but in the rest of his future life, he will be older and hence more likely to suffer from reforms; hence a rule which requires more than the simple majority for reforms will secure that fewer reforms (and only those which are most beneficial) are taken. In fact, his *average* future age is equal to that of the 75th percentile of the distribution of the population ages, and the equilibrium constitution specifies the requirement of a 3/4 majority.

We argue that from a social point of view, this rule is too conservative, leading to too few reforms. A useful comparison is the rule which maximizes the utility of an individual who is newly born into this society. Consider the US constitution; it was written in the 18th century, but the overwhelming majority of people who ever lived under this constitution were born afterwards. Hence a "socially optimal" constitution should not just be designed to maximize the utility of the generation present at the time when the constitution is written, but also that of subsequent generations which all enter with age 0 into the system. The average future age of a new born individual is the median age, and hence the rule which maximizes this individual's expected utility is the simple majority rule. Of course, in reality age is not the only factor determining the costs and benefits of a political reform for an individual. If we incorporate this in our model, the constitutionally required majority threshold decreases below 3/4, but the qualitative results of the model remain remarkably robust.

An argument that is often heard as an informal explanation for qualified majorities is that they are required for "important" decisions. The theoretical basis for this argument is however dubious. A wrong decision may be very costly in some situations, but it is unclear why this alone should generate a bias in favor of the status quo which may also be the wrong decision. Also, if people feel that the security of the status quo outweighs possible but uncertain benefits of a reform, they will consider this when casting their votes; if a majority of people thinks nevertheless that a reform is a good idea, then why should there be an additional protection of the status quo?

Our model predicts no different majority requirements for "important" and unim-

portant issues. However, our model predicts that long term projects (those which have a longer payoff period) will have higher majority requirements than short term issues. If long term issues are often important, then this might be the reason why the informal argument appears to explain some facts while nevertheless the underlying reason is a different one.

In the public choice literature, there is the idea that a constitution which inhibits the adoption of new rules can serve as a security check against a dictatorship (see Buchanan and Tullock (1962)). The most extreme form of constitutional conservatism is to require unanimity in order to change the status quo. It can be shown that under certain circumstances, especially absence of transaction costs for side payments between voters, this rule leads to an optimal allocation;[3] the problem is that this assumption is hardly ever satisfied. If it is not and one takes the idea of democracy seriously, it is not clear whether such a constitution (which has an effect only in those cases in which the majority of people wants to violate it) really protects democracy; depending on your point of view, it could also be argued that such a constitution might also create a dictatorship of the status quo against the current majority. For an argument along these lines, see Guttman (1998) who analyzes the question of an optimal constitution in a static framework; he shows that, in his setting, a simple majority rule is optimal (and also chosen, as he assumes that people vote on the constitution behind a "veil of ignorance").

Another rationale for constitutions inhibiting reforms by requiring more than simple majority for major changes is that this solves the problem of time inconsistency of optimal policies. A constitution which protects investment by inhibiting nationalization is valuable only if the constitution cannot be changed too easily after investment has taken place.

The simple majority rule may lead to cycles in electoral preferences, as shown already by Condorcet (1976). A higher required majority reduces the possibility of cycles; indeed, Caplin and Nalebuff (1988) show that a constitution which requires a $(1-(n/(n+1))^n)$ majority rules cycles out if voters have Euclidean preferences in an n–dimensional space, i.e. if each voter has an "ideal" policy point and other policies are evaluated by voters according to their distance from their ideal point. For n towards infinity, this threshold converges to about 64%. Caplin and Nalebuff use this result to rationalize qualified majority rules. In our model, voters have different preferences in a one-dimensional policy space, so a simple majority rule would suffice to rule out cycles in our model.

Fernandez and Rodrik (1994) analyze difficulties for reform projects even under

[3]In this case, also any other social decision rule would produce efficient results

simple majority rule if it is not known at the time of the vote who are the winners and who are the losers of a reform project before it is undertaken. They show that it is possible that a project which is known to benefit more than half of the population may fail to attract enough support in an election, because the *expected* benefits may be negative for the median voter due to incomplete information among voters about who gains and who loses from the reform. In contrast to their work, our model assumes that as the opportunity for a reform arises, there are no informational problems concerning the effects of the reform for everybody.

In the next section, the model is presented; results are given in section 3, and section 4 discusses some possible extensions of the basic model. Section 5 applies the model to analyze trade unions' preference for seniority based employment rules and rules applied by clubs voting on the admission of new members. The last section concludes.

2 The basic model

Consider an overlapping generations model in continuous time where individuals who are born at time τ die at time $\tau + 1$; individuals care only about their own utility, i.e. there are no dynastic concerns about the utility of their children. At each small interval $d\tau$ of time, there is a probability $\lambda d\tau$ that there arises the possibility for a *reform*. If the opportunity is not taken, each individual gets its outside utility of $\bar{u}$, normalized to 0. If the change is undertaken, it costs each individual c and brings a stream of rewards v at each moment; for simplicity, there is no discounting so that the net benefit from a reform for an individual of age t is

$$v(1-t) - c. \tag{1}$$

From an ex ante perspective, the rewards v are a continuous random variable, distributed according to a density function $f(v)$ and a cumulative density function $F(v)$; however, as the possibility for a reform arises, the realization of v for this specific reform becomes common knowledge. Whether a specific opportunity for reform is taken or not has no influence on the rate with which future opportunities arise or on the distribution of the rewards of future opportunities. For reasons to be explained later, we assume that costs and benefits of a reform only apply to those individuals who are alive at the time when the possibility for a reform arises.

This is a very stylized model of "reform", but it should capture several important points. Many political or economic reforms have the property that they resemble investment projects in their return streams: Initially, there is a cost to be borne, but eventually there will be payoffs. Just think of a trade liberalization which in the short

run may cause unemployment in the formerly protected industry, but which produces long term gains after adjustment has taken place. So if there are individuals of different age, the oldest ones will not be in favor of the change because they just suffer the costs without being able to reap the benefits. The formulation in the model that costs accrue at the first moment while benefits are a stream produces this pattern (an individual near to age 1 just suffers the cost of change but has almost no benefit). However, the qualitative results of the model would not change if we were to take a different formulation of the model as long as the basic features (there is at first a time when instantaneous costs are higher than instantaneous benefits, and this relation changes sometime afterwards) are kept.

Since v is a random variable ex ante and only some changes should be undertaken while others are not worth the cost, a rule which specifies that each change should be undertaken is certainly in general suboptimal. Instead, the society determines whether a change should be taken by voting. That social decisions are made by non-unanimous elections implies that we assume that no perfect compensation schemes are feasible which redistribute enough money from winners to losers of reform such that in the end everyone would agree to a beneficial reform. This assumption is standard (and often even implicit) in the literature, e.g. Fernandez and Rodrik (1991); it is probably also justified, given the existence of non-unanimous social decision making rules in the real world.

We analyze two different modes of voting. Under a *simple majority rule*, the change will be taken if and only if at least 50% of the electorate vote for it. Given that the benefits of a change decrease with age by (1), it is clear that the decisive person in such an election will be the person aged 0.5, the median age. Alternatively, we consider a *constitution* which is decided before the opportunity for a specific change arises. A constitution determines the majority which is required later (when there is a vote about a specific change) for a change to take place. We consider two kinds of constitutions: One voted for by those alive at the time of vote and one voted for behind the veil of ignorance by all those who will be born sometime (but are not yet)[4]. Of course, only the first kind of vote (among those who are alive) is a realistic option; however, the second kind of vote (behind the veil of ignorance) is interesting as a benchmark, since it corresponds to a natural notion of social optimality: The constitution has an effect not only on those who are alive at the time when it is decided but also on those who are born afterwards, so their preferences should be represented as well. The vote about the constitution is decided by simple majority.

[4]Whether in the second election those already alive belong to the electorate is not important because they are very few as compared to those not already born.

Our modeling that the effects of a reform only apply to those who are alive when the opportunity to introduce the change arises may seem a bit strange at first sight; it would seem more realistic to assume that the benefits accrue to all future generations. However, in such a world it is hardly surprising that there will be too little change from a social point of view under any voting rule where only those alive constitute the electorate, because they have to decide about projects which have to be paid only by them, but whose benefits accrue to others (those unborn yet) as well[5]. It is to eliminate this trivial externality that we assume that cost and benefits of a project accrue only to those alive at the time of change.

3 Results

Consider an individual of age t when there is no opportunity for a reform at the moment. Let $W(t,r)$ denote the expected *future change* in the lifetime utility of an individual of age t if there is no opportunity for a reform at the moment and if possible reforms in the future are implemented as they arise if and only if they satisfy $v \geq r$.[6] Hence we have

$$W(t,r) = \sum_{i=1}^{\infty} \int_t^1 [(1-t_i)E(v_i|v_i \geq r) - c]\phi_i(t_i,r)dt_i, \tag{2}$$

where $\phi_i(t_i,r)$ is the density function for the event that the ith reform is adopted when the individual has age t_i.[7] Clearly, these density functions depend on r, since this influences the probability that the reform is adopted. In this case, the utility change from adoption for the individual is $[(1-t_i)E(v_i|v_i \geq r) - c]$; here, $E(v_i|v_i \geq r)$ is the expected value of v_i given that we have $v_i \geq r$.

In order to calculate (2), we use the following relationship:

$$W(t,r) = W(t+\Delta t,r) + \lambda \Delta t(1-F(r))[(1-t)E(v|v \geq r) - c]. \tag{3}$$

[5]In fact, from a social point of view all projects with a positive v should be undertaken since for a one time cost there is an eternal stream of benefits (and remember that there is no discounting); however, even the youngest alive (aged $t = 0$) only break even for $v = c$, and the median voter only benefits from projects with $v \geq 2c$.

[6]Each majority rule corresponds to a certain threshold r; more specifically, the higher the required majority, the less reforms are implemented and consequently the higher is the corresponding r. We use this formulation since it is easier to work with.

[7]Of course, since the ith reform does not necessarily take place during the future lifetime of the individual, each density does not integrate to 1 between t and 1. Reform opportunity i may already have passed before the individual attained age t (in which case $\phi_i = 0$ between t and 1), or it may materialize after the death of the individual.

Let us explain equation (3). The expected future utility change at age t is equal to the expected future utility change at age $t+\Delta t$ plus the expected change arising from reforms between age t and age $t+\Delta t$. With probability $\lambda\Delta t$, there arises the opportunity of a reform within the interval $[t; t+\Delta t]$;[8] in this case, a reform is really undertaken only if $v \geq r$, which has probability $(1-F(r))$. Finally, if the reform is undertaken, the ex ante expected value of adoption for an age-t-individual is $[(1-t)E(v|v \geq r) - c]$.

Letting Δt approach zero, we get a differential equation from (3) which we can solve using the terminal condition $W(1,r) = 0$; this yields

$$W(t,r) = \frac{1}{2}(1-t)^2\lambda(1-F(r))E(v|v \geq r) - (1-t)\lambda(1-F(r))c. \tag{4}$$

Using this result, we can now look at several situations:

1. A social optimum with respect to those alive (in the following called "SO1") maximizes the sum of utilities of individuals of all different ages, $\int_0^1 W(t,r)dt$.

2. Another useful definition of social welfare ("SO2") incorporates the utility of all those individuals who are not yet born; in fact, since there are infinitely more individuals who are not yet born than those already alive, only the utility of those not yet born would be considered, so the objective to be maximized in this case is $W(0,r)$. Finally, note that if there were a vote about the constitution in which all those who are yet unborn would be in the electorate, a constitution would be chosen which corresponds to the maximization of SO2.

3. If there is a majority vote on a specific reform project, the median voter (who, as mentioned above, is clearly the person aged 0.5) will vote for the reform if he benefits from the reform, so if $v/2-c \geq 0$. This gives us a threshold of $r_{MED} = 2c$.

4. Finally, suppose that there is a vote about a constitution which specifies the rules for elections about specific reform proposals. Again, for the vote about the constitution, the median aged voter is pivotal (this will be shown below). Hence, the constitution will maximize $W(0.5,r)$.

Let us start with SO1. We have

$$\int_0^1 W(t,r) = \frac{1}{6}\lambda(1-F(r))E(v|v \geq r) - \frac{1}{2}\lambda(1-F(r))c =$$

$$\frac{1}{6}\lambda\int_r^\infty vf(v)dv - \frac{1}{2}\lambda(1-F(r))c, \tag{5}$$

[8]The probability that there arise more than one opportunity is a second order term which can be neglected for Δt small enough.

using the definition of a conditional expectation. Maximizing (5) with respect to r and canceling the terms $\lambda f(r)$ from the first order condition, we obtain

$$r_{SO1} = 3c \tag{6}$$

According to the criterion SO1, only reforms with a benefit greater than $3c$ should be undertaken; expressed differently, this rule specifies that only projects which benefit at least 2/3 of the population should be undertaken.[9]

This may seem paradoxical at the first sight. Why is the optimal threshold not at 1/2 of the population, given the apparent symmetry of the problem? It is true that a project with $v = 2c$ benefits the younger half of the population as much as it hurts the older half. In fact, this is the situation in which the median individual *for a specific reform* would be indifferent. However, the question here is not about a *specific* reform, but about *general rules valid at least for the rest of life of the population living at the moment.* At the "average" reform opportunity in his future life, an individual aged t will be older than t ($(1+t)/2$, to be exact). Hence, while the older half of the population is against a project with $v = 2c$, those younger than 1/2 would momentarily benefit from such projects, but as they have to consider that the same rules apply as they grow older, they also (at least some of them) benefit from a rule which precludes the adoption of a reform with $v = 2c$ for the rest of their lives.

Finally note that (6) is independent of λ and of the distribution of v. The intuition for the independence of r_{SO1} from λ is that the decisive point for each individual is the expected average time in his life when reforms are taken. If λ is high, then there are more reform opportunities (in expectation) in the residual lifetime of an individual than when λ is low. However, the *average* reform opportunity with respect to the future life of an individual aged t today arises under both circumstances at $(1 + t)/2$. The reason for the independence of r_{SO1} from the distribution of v is that only the actual realizations of v are crucial for the question whether a specific reform should be undertaken. Note that the independence from the distribution of v also implies that the distribution may be such that a reform never takes place; this is here the case if the support of v contains only values below $3c$.

As argued above, another useful interpretation of social welfare is SO2, i.e. to consider just the utility of an individual who is newly born in this society, and to choose r such that this utility is maximized. Evaluating (4) at $t = 0$ and differentiating with respect to r yields

$$-\frac{1}{2}\lambda f(r)r + \lambda f(r)c = 0, \tag{7}$$

[9]Under a 2/3 majority rule, the pivotal voter has age 2/3. He votes for a reform if and only if $(1 - 2/3)v \geq c$; this gives a threshold of $3c$, as claimed.

implying

$$r_{SO2} = 2c. \tag{8}$$

Comparing this to r_{SO1}, the socially optimal threshold when only those alive are considered, we see that reforms are taken more often here. The reason is that the age of those not yet born, 0 by definition, is lower than the average age of all those alive; hence they are more in favor of reforms, since their payoff time is longer.

It is remarkable that r_{SO2} exactly equals the result from a simple vote on each project; reforms are undertaken in both cases if and only if they benefit the majority of the population. However, this result would change if we did not have a net utility change function (1) which is linear in age; a net utility change function which is only monotonically decreasing in age will have $r_{SO2} < r_{SO1}$ and $r_{MED} < r_{SO1}$, but not necessarily $r_{SO2} = r_{MED}$.

Finally, let us consider the following scenario: At first, all individuals vote over a constitution. The constitution specifies the share of votes required in later elections about specific reform projects for a reform to take place. The threshold $r(t)$ which is optimal for an individual of age t is given by

$$\frac{\partial W(t,r)}{\partial r} = -\frac{1}{2}(1-t)^2 \lambda r f(r) + (1-t)\lambda f(r) c = 0 \tag{9}$$

which yields

$$r(t) = \frac{2c}{1-t}. \tag{10}$$

Clearly, the older people are, the higher is the r which is optimal for them. Since this relationship is monotonic, the individual of median age is decisive in the election about the constitution and inserting $t = 0.5$ in (10) yields

$$r_C = 4c. \tag{11}$$

This threshold is equivalent to a requirement in the constitution that reforms can only be undertaken if they have the support of 3/4 of the population. This is remarkably conservative compared to the simple majority rule, SO1 and SO2.

Why is $r_C > r_{SO1}$, although in both scenarios only the current population is considered (or may vote)? Start from r_C and consider a decrease in the required threshold. By definition of r_C, this leaves the median voter almost indifferent while it benefits younger and hurts older individuals. However, the benefits to younger individuals are larger than the losses for older ones, since the change in r applies for a longer time for younger individuals. This is taken into account in the maximization of $\int_0^1 W(t,r)dt$ (i.e. SO1), but not so in the election about the constitution.

For ease of reference, we sum up our results so far in the following

Proposition 1 *1. If there is a majority vote on a specific reform, the reform will be undertaken if and only if it has $v \geq 2c$, i.e. if it benefits the median voter.*

2. *If there is a simple majority vote about a constitution, the winning proposal for a constitution will specify that a 3/4 majority is needed for a change of the status quo to pass.*

3. *If we consider those individuals alive at any particular moment in time and want to maximize their aggregate utility by a time invariant rule, this rule specifies that a reform passes if it has the support of at least 2/3 of the electorate.*

4. *If we consider the utility of an individual newly born into this society, a simple majority rule maximizes its utility.*

4 Discussion and extensions

In this section, we want to discuss two possible extensions of our model, namely different forms of the net utility change function (1) and time consistency of the equilibrium constitution. We will argue that our results are relatively robust to different specifications of the model.

4.1 Different functional forms

The functional form of (1), although it reflects the intuition that many political reforms resemble investment projects, may seem somewhat special nevertheless; the costs of reform have to be borne at once while the benefits accrue over time. Naturally, this makes old people extremely conservative. A different possible (and perhaps more plausible) specification of costs is that only some costs accrue directly at the time the reform is implemented and other costs accrue as a stream, as do benefits. This would lead to the following analogue of (1):

$$v(1-t) - [c_0 - c_1 t] \tag{12}$$

However, this can be written $(v - c_1)(1 - t) - (c_0 - c_1) = \tilde{v}(1 - t) - \tilde{c}$. Since this has the same form as (1) and our results are independent of the density function of v, the different threshold values r remain the same as in the basic model; these thresholds just have to be applied with respect to $(\tilde{v}, \tilde{c})$ rather than (v, c). As in the basic model, the equilibrium constitution specifies a 3/4 majority.

In the basic model, all people of the same age had the same benefit from reform, and older individuals' benefit was always lower than that of younger individuals. If

individuals differ in their benefits from reform in a second way (other than their age), we can model net benefits as follows:

$$v\varepsilon(1-t)-c \tag{13}$$

Here, ε is a random variable which may be different for different individuals. Higher values of ε correspond to higher benefits from reform. Hence an old individual who has a higher value of ε may be more in favor of reform than a young individual with a low value of ε. This is certainly a step towards more realism since age is *one* factor influencing the attitude towards reform, but it is certainly not *the only* one.

We assume that each individual can observe its realization of ε for a specific reform (as well as v), but that ex ante ε is a random variable with expected value 1 which is distributed independently across individuals and independently of v.[10] Under this technology, the analogue to (3) is

$$W(t,r)=W(t+\Delta t,r)+\lambda\Delta t(1-F(r))[(1-t)E(v\varepsilon|v\geq r)-c]. \tag{14}$$

By independence of ε and v and $E\varepsilon=1$, this is equivalent to (3); hence, the thresholds $r_{SO1}=3c$, $r_{SO2}=2c$ and $r_C=4c$ remain unchanged.

Note however that the majority which is required to implement these thresholds changes:

Proposition 2 *Let $g(\varepsilon,h)$ be a family of density functions of ε, with increasing h corresponding to a mean preserving spread.*[11] *Then*

1. *A mean preserving spread in the distribution of ϵ decreases the constitutionally required majority.*
2. *For all non-trivial distributions of ε, the majority requirement specified in the constitution is lower than $3/4$.*
3. *If ε is uniformly distributed in $[1-h;1+h]$, the constitutionally required majority is a decreasing function of h which goes to $3/4$ as h goes to 0 and to $1/2$ as h goes to ∞.*

Proof: Define the proportion of individuals voting in favor of a reform of value r as

$$M(r,h)=\int_0^1\int_{\frac{c}{(1-t)r}}^{\infty}g(\varepsilon,h)d\varepsilon dt, \tag{15}$$

[10] In the following, it is easiest to think of an infinity of individuals at each age. Then, the average value of the reform for individuals of age t is $v(1-t)-c$ as in the basic model.

[11] This means that we have $\frac{\partial}{\partial h}\int_{-\infty}^{x}G(\varepsilon,h)d\varepsilon\geq 0$ for all $x\leq\bar{\varepsilon}(h)$ and $\frac{\partial}{\partial h}\int_{-\infty}^{x}G(\varepsilon,h)d\varepsilon=0$ for $x\rightarrow\bar{\varepsilon}(h)$, where $G(\cdot)$ is the cumulative density function corresponding to $g(\cdot)$ and $\bar{\varepsilon}(h)$ is the highest value in the support of ε. See, e.g., Laffont (1989), ch. 2.

Using the definition of $G(\cdot)$ and substituting $y = \frac{c}{(1-t)r}$, we have

$$M(r,h) = 1 - \int_{c/r}^{\infty} G(y,h)\frac{c}{ry^2}dy \tag{16}$$

Since for all x $\frac{\partial}{\partial h}\int_x^{\infty} G(\varepsilon,h)d\varepsilon < 0$ from the definition of a mean preservin[illegible]read and since $\frac{c}{ry^2}$ is a decreasing and positive function, it follows that we have $\partial M[illegible]h)/\partial h < 0$.

The second claim is a corollary of the first result in combination with Proposition 1 (if $\varepsilon = 1$ with certainty, the constitutional majority is 3/4).

For the last part, rewrite $M(r,h)$, changing the order of integration,

$$\begin{aligned} M(r,h) &= \int_{c/r}^{\infty}(1-\frac{c}{r\varepsilon})g(\varepsilon)d\varepsilon \\ &= \int_{\max(c/r,1-h)}^{1+h}(1-\frac{c}{r\varepsilon})\frac{1}{2h}d\varepsilon \\ &= \frac{1+h-\max(c/r,1-h)}{2h} - \frac{\ln(1+h)-\ln(\max(c/r,1-h))}{2h(r/c)} \end{aligned} \tag{17}$$

Since h parameterizes a mean preserving spread, it follows from the first part of this proposition that $\partial M/\partial h < 0$.[12] Applying Hopital's rule shows that $\lim_{h\to 0} M(r,h) = 1 - \frac{c}{r}$ and $\lim_{h\to\infty} M(r,h) = 1/2$, as claimed. *QED.*

For example, if ε is uniformly distributed between 0.8 and 1.2 (instead of concentrated at 1), the majority requirement which accomplishes that all reforms with $v \geq 4c$ pass (i.e. the majority required in the constitution) is about 74.6 %; for ε uniformly distributed between 0 and 2, the corresponding figure is about 61.5%; hence even for a large variation in the benefits from reform which is not related to age, the constitutional threshold is considerably higher than 1/2.

4.2 Time-consistency

In this subsection, we analyze the question of time consistency of the equilibrium constitution. Is there ever a majority of people who want to change the constitution, and if so, what are the consequences? The answer depends on what majority is required to change the constitution and on the effects of a change in the constitution, more specifically the time at which a possible change in the constitution takes effect.

However, before we come to these questions, we should remark that we restricted the class of feasible constitutions to constitutions, in which the majority requirement remains constant over time. Our justification for this restriction has to do with time

[12] Alternatively, one can check this directly, but this is quite tedious.

consistency. It is easy to come up with time variable constitutions which would be preferred by a majority to the equilibrium (constant) constitution. A simple example is the function (for small δ)

$$r_V(t) = \begin{cases} (4+\delta) & t \leq 0.5 \\ 5c & 0.5 \leq t \leq 1\,, \\ \text{arbitrary} & \text{otherwise} \end{cases} \tag{18}$$

which would be preferred by more than 90 % of the initial population to r_C.[13] There are however two major problems with solutions like $r_V(t)$ in which the required majority varies with time. First, they are not time consistent. At time 0.5 (and also thereafter) a majority of the people who live then would like to revise $r_V(t)$ downward. Second, it can be shown that there is generally no Condorcet winner in the class of constitutions which vary with time,[14] so there would be in general no equilibrium if we did not restrict our attention to constant constitutions. Finally, a positive argument is that we only observe constitutions in the real world which do not vary with time.

Let us now return to the main question of time consistency of our equilibrium (constant) constitution. In a situation in which there is no possibility to reform, the majority would again vote for the equilibrium constitution; in effect, since the reform possibility arrival process is a Poisson process, this situation is the same as that which was used to define the equilibrium constitution.

Next, consider situations in which an opportunity to reform has arrived. Obviously, if this reform will be accepted under the current constitution, then there will be no majority to adjust the constitution to the effect that the reform is then rejected. A problem might only arise if there is a majority of people who would like to implement the reform, but which is smaller than the majority required by the current constitution. In this case, there exists an incentive to adjust the constitutionally required majority threshold downwards. Even in this case, there are two plausible, alternative conditions which secure that the constitution will not be changed.

If the majority which is required to change the constitution is the same as (or larger than) the majority threshold for the change of ordinary laws (in the vote over reform proposals), then there will never be a change of the constitution: The pivotal voter has no incentive to adjust the constitution downward; he is against the specific reform

[13](Almost) all people older than 0.5 prefer $r_V(t)$ since it has a higher threshold during their lifetime. People younger than 0.5 are only slightly worse off during the first interval; in the second interval, the initially young people have then an age between 0.5 and 1, and a large majority of them (at least all older than 0.6) benefit considerably from an increase in the threshold; hence those younger people also prefer $r_V(t)$ to r_C.

[14]A proof of this claim is available from the authors on request.

project (for otherwise no change of the constitution would be necessary) and the pivotal voter would also lose from a decreased threshold in all following elections.

However, what happens if the constitution can be changed by a simple majority? Then the question is how soon a change in the constitution would become effective. If changing the constitution takes so long that a change does not take effect before the vote over the *next* (up to now unknown) reform opportunity, then again we are effectively in the situation for which the equilibrium constitution was defined and so there will be no majority for a change. Casual evidence suggests that changing a constitution usually takes quite long.

Only if the constitution can be changed by simple majority *and* this change becomes effective immediately, one might find a majority for a revision of the constitution. Suppose a new opportunity for a reform arrives which has a v slightly below $4c$. Then it would be attractive for the median voter to revise the constitution and to lower the required threshold exactly so far that this reform can pass, even if this means that the new, lower threshold is valid for the future. For this case, it is interesting to look for a constitution with the largest possible threshold r_T which has the property that there is never a majority who would like to adjust the threshold majority in the constitution downward if this means that the new threshold remains in force forever after.[15]

At first sight, it appears that r_T should be higher if λ is high, for in this case there will be many reform projects in the future life of the median voter and hence it will be more costly for the median voter to lower the threshold than if λ is low. Surprisingly however, independent of λ, we have $r_T = 2c$; only the simple majority threshold will never be adjusted downward. Suppose $r_T > 2c$ and consider what happens if a reform project with $\tilde{v} = r_T - \delta$ arrives. If the constitution is kept, this reform project will not be implemented and the expected further utility of the median voter is $W(0.5, r_T)$. If the constitution is changed so that the project can pass, the new threshold is $r_T - \delta$, and the median voter has an expected further utility of $\tilde{v}/2 - c + W(0.5, r_T - \delta)$. For $\delta \to 0$, this converges to $r_T/2 - c + W(0.5, r_T)$ which is greater than $W(0.5, r_T)$ if $r_T > 2c$. So, $r_T = 2c$ is the largest threshold with the described property.[16]

That $r_T = 2c$ is not too surprising. If all commitment power is removed from the constitution in the sense that it can be changed immediately by simple majority, then there is no point in writing a constitution and committing to a procedure which

[15]Of course, if there is no reform project pending at the moment, the median voter's optimal constitution has $r = r_C$ (by the definition of r_C). However, voting for this constitution is pointless if it is known that it will be changed as soon as a new reform proposal arrives.

[16]Note however that the argument relied on $\tilde{v}$ possibly being arbitrarily near to r_T; if $f(v)$ is *not* everywhere positive in $[2c; 4c]$, it could be possible (depending on parameters) to find an $r_T > 2c$ which is time consistent.

will some day be regretted by a majority of people. However, if there is slightly more commitment power with a constitution, whether it can be changed only by qualified majority or not with immediate effect, then the equilibrium constitution with threshold $r_C = 4c$ is robust and will never be changed.

5 Discussion and Applications

In this section, we would like to discuss cases for which our model is applicable, but also its limitations. We start with two important applications of our results to voting in other organizations than the government of a state.

Voting over admission to clubs. An important application of our model is voting in clubs about whether and which new members should be admitted to the "club". A club is understood here in a broad sense as a community of several individuals who have united in order to supply some impure public good to each other.[17] Examples of clubs include trade unions, political organizations like the European Union or the department of economics at a university. In all these organizations, the question how many persons and who should be admitted to the club is of considerable importance, and members may have considerably differing tastes. An important phenomenon in this context is that the admission of a new member changes the electorate in the future. A qualified majority rule may be used to protect old members against the dilution of their voting share in future elections.

Roberts (1999) analyzes the dynamic evolution of a club which votes about the number of members in every period. However, Roberts' model is static in the sense that the environment and the potential club members do not change over time. In principle, all decisions could be made in the first period's election; a dynamic evolution of the club's membership only results because it is assumed that voters cannot commit for more than one period. Moreover, the model exogenously imposes a simple majority rule for the vote about membership.

Consider for example the expansion of the European union. At first sight, this seems to be a case where our overlapping generations model is not applicable, since member states do not die (or leave in another way when they become old). However, the only force necessary for a qualified majority requirement in the equilibrium constitution is that old voters benefit less from a reform (i.e. the admission of a new member state) than young voters. This has a natural interpretation (although different from the one in the model) in the case of the

[17] See Buchanan (1965).

European union: It is quite plausible to assume that states benefit more from a neighbouring state becoming a member of the EU than if the enlargement pertains to a far distant state.[18] Geographically, it is clear that old members will mainly have borders with other old members while new members usually have borders with non-member states. Hence new members utility from the next candidate joining will be (in general, at least) higher than for old members. As a protection against being ultimately in the minority, old voters may wish to establish a qualified majority requirement for the decision about new members. In the case of the European union, this is the case: The admission of a new member state requires unanimity.

Trade unions and seniority based employment rules. Unions often appear to have a preference for firing being based on seniority if a firm is in financial distress: Under a seniority based employment rule, a worker can be fired only if there are no workers who are younger than he is and are not fired. The effects of seniority based employment rules are analyzed in many union models (see, e.g. Grossman (1983), Blair and Crawford (1984), Weiss (1985), Drazen and Gottfries (1994)). However, the rule itself is hardly ever derived endogenously, but rather it is assumed that "incumbents" control the union at the expense of newcomers.[19] As most labor unions are in principle democratic with one-man-one-vote rules, this assumption is not very satisfying.

Assume the following "downsizing" scenario, which is a very reduced form of a problem in a union, but employs some quite realistic assumptions:

1. Every period, one (old) worker leaves the firm and one (young) worker joins it. There are n generations of workers.
2. The wage paid by the firm is equal for all workers and an increasing function of the production per worker.
3. If there is a negative demand shock, employment in the firm must be reduced by a fixed number of workers, say x, which is smaller than half the number of workers employed before.
4. There is at most one negative demand shock, and its arrival follows a Poisson process (as the arrival of a reform opportunity in the model of this paper).[20]

[18] This will for example be the case if nations trade more the nearer they are to each other, because of transportation costs.

[19] An exception is Kuhn (1988) and Kuhn and Robert (1989) who derive a kind of seniority rule as the optimal solution of a non-linear pricing problem of a monopoly union. This explanation is different from the one offered by us.

[20] The assumption that there is only one shock is made just for ease of exposition.

5. The unemployment benefit is equal for all workers, and all prefer strictly to be employed by the firm (as compared to being fired).
6. Older workers are less productive than younger workers.[21]

Suppose the negative demand shock has occured and the union has now to decide who should be fired. In this case, assumptions 2 and 6 imply that it is in the interest of the median aged worker to fire the x oldest workers, because these have the lowest productivity, and the median voter's wage is increasing in average productivity.

Now consider the case that the negative demand shock has not yet occured, but that a general rule is voted on. It is clear to see that, depending on parameters, the median voter might very well benefit from adopting a rule which ensures that younger workers are fired first. Although such a rule hurts the median voter if the negative shock occurs in the next few periods when he would not be among the x least productive workers, it protects him against losing his job later on.

This scenario seems to imply very similar payoffs for old and young workers as in our model. So why is it that trade unions usually commit ex ante to a seniority rule rather than imposing a qualified majority rule and voting about who should be fired in case of a shock? A qualified majority rule would have some severe problems here. First, the most general elections possible here would not be binary, and so existence of a voting equilibrium is not guaranteed. In order to exclude this problem, suppose there are just 2 proposals on the ballot, namely to fire the x youngest workers and to fire the x least productive workers. If the required majority in the election were larger than $n - x$ workers, no proposal could win (otherwise, some voters would have to vote for their own firing). If the required majority is smaller than $n-x$ workers, the $n-x$ most productive workers clearly find it in their interest to fire the x least productive ones; so, such a qualified majority rule does not generate any other result than a simple majority rule and hence a qualified majority requirement would not offer an additional protection for the median voter.

The problem for the median voter when deciding about a constitution (and assuming that he would benefit from at least some protection against being fired when older) is to design a rule which gives veto power to the x oldest workers without giving veto power to the x youngest workers. One way of doing that is

[21] More realistically, this could be true stochastically in the following sense: Some workers lose a part of their productivity in the second half of their work life, and it is uncertain for the median voter whether he will be one of them or whether he will keep his productivity

to write a contract with the firm, specifying a seniority based employment rule, and to elect an old worker as the union leader who personally has no incentive to renegotiate the contract in the event of a demand shock. This union will appear to be dominated by senior worker's interest, a phenomenon noticed by many papers about union's objectives. However here, this is not a consequence of an assumption that older workers are (exogenously) more powerful, but derived as the rational voting equilibrium of a union in which members have ex ante equal votes.

Short term versus long term issues. Our model applies best to long run issues, i.e. projects which require an investment at first and then have a long time of payoffs. In short run issues, i.e. if costs and benefits of the project accrue in a relatively short period of time, the interests of young and old people are very similar; people may be differently affected by a project, but the correlation between the attitude towards a project and age will in general be small in short run issues. We would therefore expect that there are qualified majority requirements for long term issues, but not for short term issues. Although long term issues are often also "important", our prediction differs from this classical explanation of qualified majority rules, and in principle it should be possible to test the difference.

Investments versus disinvestments. Our analysis applies to projects which have investment properties in that they first require some initial expenditure and then will deliver a payoff. There may be other reform proposals which have exactly the opposite nature and are disinvestments. Disinvestments are favorable for older voters, so, by an analogous argument to that used in our model, the median voter would like to set the threshold rather too low; however, stability of the social decision rule will always require at least a simple majority.

6 Conclusion

Many social decision rules in the real world state explicitly or implicitly that changes of the status quo require a qualified majority, i.e. there is a threshold above 50 % of the electorate which must vote for a reform in order for the reform to be implemented. Our model is the only one we know of to predict a qualified majority requirement in a constitution,[22] so this paper fills an important gap in the theory of political economy.

[22]Caplin and Nalebuff (1988) can also be interpreted as an argument in favor of a qualified majority; however, their argument is based only on the exclusion of electoral cycles which are not possible in our model.

In an overlapping generations model, we supply a simple and new explanation for qualified majority rules: The older people are, the more likely are they to lose from long term reforms. When voting on a social decision rule, people will consider that during their future life, they will be older than they are today; consequently, they will vote for a rule which tends to inhibit reforms; the effect of a qualified majority rule is that only the most worthwhile reforms are taken. From a social point of view, the equilibrium constitution is too conservative since many of the less conservative individuals (i.e. those who are not yet born) are not allowed to vote in the election about the constitution.

7 References

Blair, D. and Crawford, D. (1984): "Labor Union Objectives and Collective Bargaining", *Quarterly Journal of Economics*, 99(3), 547-66.

Buchanan, J. (1965): "An Economic Theory of Clubs", *Economica*, 32, 1-14.

Buchanan, J. and Tullock, G. (1962): "The Calculus of Consent.", University of Michigan Press, Ann Arbor.

Caplin, A. and Nalebuff, B. (1988): "On 64%-majority rule.", *Econometrica*, 56, 787–814.

Condorcet, M.d. (1976): "Essay on the Application of Mathematics to the Theory of Decision Making", *Condorcet, Selected Writings*, ed. by K. Baker, Indianapolis: Bobbs-Merrill.

Drazen, A. and Gottfries, N. (1994): "Seniority Rules and the Persistence of Unemployment", *Oxford Economic Papers*, 46(2), 228-44.

Fernandez, R. and Rodrik, D. (1991): "Resistance to Reform: Status Quo Bias in the Presence of Individual-Specific Uncertainty", *American Economic Review*, 81, 1146–1155.

Grossman, G. (1983): "Union Wages, Temporary Layoffs, and Seniority", *American Economic Review*, 73(3), 277-90.

Guttman, J. (1998): "Unanimity and majority rule: the calculus of consent reconsidered", *European Journal of Political Economy*, 14, 189–207.

Kuhn, P. (1988): "A Nonuniform Pricing Model of Union Wages and Employment", *Journal of Political Economy*, 96(3), 473-508.

Kuhn, P. and Robert, J. (1989): "Seniority and Distribution in a Two-Worker Trade Union", *Quarterly Journal of Economics*, 104(3), 485-505.

Laffont, J.-J. (1989): "The Economics of Uncertainty and Information", Cambridge (Ma.): MIT Press.

May, K.O. (1952): "A set of independent, necessary and sufficient conditions for simple majority decision.", *Econometrica*, 20, 680–684.

Roberts, K. (1999): "Dynamic Voting in Clubs", mimeo.

Tullock, G. (1998): "Reply to Guttman", *European Journal of Political Economy*, 14, 215–218.

Weiss, Y. (1985): "The Effect of Labor Unions on Investment in Training: A Dynamic Model", *Journal of Political Economy*, 93(5), 994-1007.