Moral cost, commitment, and committee size*

Steffen Huck† and Kai A. Konrad‡

April 1, 2004

Abstract

Consider a committee that in the past has made a promise not confiscate the profits from an investor. After the investment has taken place, there is a material benefit if the committee decides to default on the earlier promise. But in some situations there are also some small moral costs for those who vote in favor of default. For given benefits of default, time consistent default can be ruled out for sufficiently large committees. Experimental data confirms our predictions.

Keywords: Coordination, commitment, democracy, voting

JEL classification numbers: D71, D72, H77

1 Introduction

Niccolo Machiavelli (1531/1989 p.318) claims in the *Discourses on the First Decade of Titus Livius* that democracies are more reliable in keeping promises than dictators. In an example he refers to a situation in the 5th century BC after the defeat of Xerxes when the population of Athens faced an interesting opportunity. The fleet of their allies was in a place where it could easily be destroyed. Doing so would have established them as the dominant power in all Greece. But while such an attack would have been very much to the political advantage of Athens it would also have been a breach of earlier promises. In a ballot the people of Athens rejected the proposal that was characterized as very profitable, but very dishonorable. Machiavelli claims

*We thank David deMeza, Werner Güth and seminar participants at Jena for helpful comments and suggestions. The usual caveat applies.

†University College London and ELSE.

‡Social Science Research Center Berlin (WZB) and Free University of Berlin. Correspondence address: Kai A. Konrad, WZB, Reichpietschufer 50, D-10785 Berlin, Germany. E-mail: kkonrad@wz-berlin.de.

that a dictator would have been more likely to default.[1] Machiavelli does not offer a theoretical reason for this but still generalizes the idea: democracies should be less inclined to behave opportunistically than more centralized governments like, for instance, dictatorships.

Machiavelli's example is a case where optimal policy might suffer from time-inconsistency: *Ex ante*, Athens may want to commit to being friendly to their allies. However, *ex post*, when the chance has arisen, they may want to default and destroy their allies' fleet. In this paper we shall offer an explanation for Machiavelli's claim that democracies are less likely to default than dictatorships.

The idea is that default—breach of a promise or contract—may cause small psychological costs caused for those who vote for it. These costs are discussed in detail later. It could be feelings of guilt if voting is anonymous, and, in addition, feelings of shame, or a reputational cost, if the individual vote is observable. Indeed we shall assume that these costs are much smaller than the economic costs or benefits that are at stake. Now, consider a committee that in the past has made a promise, say, not confiscate the profits of a foreign investor. After the investment, the committee meets again and this time they vote on whether or not to breach their promise. For each committee member the economic benefits of default outweigh the small psychological costs. However, at the same time each committee member prefers that *the others* will vote for the proposal to default. We will show that, as a consequence of this, large committees are less likely to default than small committees. Thus—given the prevalence of some moral sentiments—the degree of commitment can be chosen on a constitutional stage by a choice of committee size. This sheds some new light on the role of democratic institutions for the functioning of a constituency but also the role of "moral norms". In their absence commitment is much more difficult to achieve. Or, as Monoson and Loriaux (1998, p.285) put it in their recent analysis of Thucydides' *History of the Peloponesian War*: "... it is precisely when the norms of moral conduct are disrupted that states and individual find it next to impossible to chart a prudent course of action."

Whether or not democracies are more able to make binding commitments has generated much interest among political scientists. Gaubatz (1996) surveys some reasons that have been suggested by political scientists why a democracy could be more able to make binding commitments, for instance, in international relations. First, the multiple levels of democratic domestic

[1] See also Cicero, *De Officiis*, book III, chapter 11, paragraph 49 for a reference to this event. Another early reference to this story is Plutarch's (75 A.C.E.,1998, p.99n.) biography of Themistocles.

politics may cause inertia, and hence, a status quo bias. Second, a transition of power from one person to another is a less drastic change in a democracy than in authoritarian states, and legal norms could be more important in democracies than in authoritarian states. A third aspect is the role of audience cost that may link domestic and international accountability.

A considerable literature in economics highlights that it could be particularly difficult in a democracy to achieve commitment, and shows that this may cause inefficient policy outcomes (see, e.g., Besley and Coate 1997, 1998). However, there are also results suggesting that democracies are more able to commit. With heterogeneous preferences, supermajority rules can be used to achieve commitment (see, e.g., Gradstein 1999, Dal Bó 2002, and Messner and Polborn 2003). Delegation of decision making to an agent whose preferences differ from the electorate's preferences and who implements a time consistent policy may also generate commitment.[2] We will put forward a reason for the ability to commit that differs from these reasons. In particular, it does not rely on heterogeneity of voters. In fact, we will assume that all voters have identical preferences.

In this paper we will show that there is a coordination problem in democracies that can *yield* commitment. The coordination problem occurs even in a democracy in which all voters have identical endowments and preferences. We first consider a representative democracy in which decisions are made by a homogenous committee. We show that the likelihood for individually opportunistic behavior to occur increases in the number of agents that can cast a vote (that is, the committee size). If the committee becomes sufficiently large, and if voters cannot coordinate, the equilibria that imply the possibility of default cease to exist. Intuitively, suppose a given percentage of votes is needed for the desired (opportunistic) outcome. Each voter may like the outcome, but may dislike (for many reasons) to be a voter who votes for this outcome.[3] In this case coordination among voters is required, and

[2]See, for instance, Persson and Tabellini (1994) and Garfinkel and Lee (2000). The modern economic literature on the efficiency of democracy suggests that lack of commitment and discretionary time consistent decision making is a problem particularly for democracies, compared to a stable monolithic regime. In contrast, Howitt and Wintrobe (1995), and Wintrobe (2000) consider one of the main differences between dictatorship and democracy that dictators have more discretion, in terms of a wider action space, whereas democracies are often paralysed by inaction. This suggests that opportunistic policy choices may be feasible for dictators, but not viable in a democracy. In turn, this would imply that commitment may be feasible in a democracy whereas, in a dictatorship, it is not.

[3]A large literature studies the importance of committee size and voting rules for the aggregation of information in voting decisions. For a survey and an analysis of optimal committee size and voting rules with endogenous information acquisition see Persico

this becomes more difficult when there are many voters. This logic establishes a theoretical basis for Machiavelli's claim about the superior ability of democracies to commit on ex-post irrational outcomes.[4]

In the simple problem considered, a constitutional choice of committee size may be a rather indirect way to achieve commitment. Instead, constitutional rules could rule out decisions that are breach of a promise. Such rules would be impracticable or even impossible to enforce. For instance, it would be required that a decision today has to define all actions and future decisions to be taken for all future contingencies. As the incomplete contracts literatur illustrates, this is a hopeless task. The choice of committee size, instead, is a simple constitutional rule that allows some commitment to earlier decisions, without eliminating ex-post flexibility completely, and without requiring complete contracts.

Tyran (2002) analyses a voter's trade-off between voting to increase the likelihood of attaining the preferred decision outcome and expressive voting. He conducts a series of experiments and concludes that there is evidence of expressive voting. Expressive voting preferences are similar to the moral benefits of "voting for doing the right thing". Tyran provides an illustrative example for this trade-off in the context of voting for a tax that is used to support the poor in which voters would like to feel the warm glow of having voted for this charitable program, but secretly hope that the majority will vote against the program. Our results on committee size apply to this problem as well, suggesting that voting in sufficiently large committees become fully determined by expressive voting.

Having established the main theoretical result we discuss various extensions and issues of robustness. Then we use experimental results obtained in frameworks that are structurally equivalent to check the qualitative features of our model. The evidence in these experiments is in line with our theoretical predictions. We then conclude with a summary and a discussion of the results.

(2004). For the commitment effect we identify here, aquisition or processing of information is not essential.

[4]Our approach also does not rely on voter uncertainty about policy proposals or candidate quality. Fernandez and Rodrik (1993) considered how voters' uncertainty about the implications of a policy proposal causes consistency problems and shows that uncertainty can also yield some commitment in the form of a status-quo bias.

2 Default in committees

Consider the following type of problem. An agent decides whether to make an investment in a city, or region that is governed by a committee, for instance, a city council, or a regional parliament.[5] The investment is profitable and yields returns that exceed the investment cost. However, the agent will make this investment only if the share in the returns that goes to the investor is sufficiently large. The committee has promised not to confiscate the returns of the investment, but whether or not confiscation of the returns takes place is a decision which is made by a committee after the investment decision has been made. The committee may then find it in the collective interest not to keep the promise and confiscate the returns. For our analysis we assume that the investment has taken place, and we focus on the committee decision once the investment is made.

The committee decides whether or not to confiscate some amount T. If confiscation occurs, this amount is equally distributed among the set of all citizens of the region. The number of citizens is $2n+1$ and is exogenously given here. Hence, each citizen receives a share in the confiscated returns equal to $t = \frac{T}{2n+1}$ if the returns are confiscated, and zero otherwise, where 'zero' is just a normalization.

The committee decides by majority voting whether or not T is confiscated.[6] The committee members are also citizens of the region. The committee size can be chosen on a constitutional stage, but is exogenous once the investment is made and when the decision has to be made whether the returns are confiscated or not. The committee has $2m+1$ members, where $m \leq n$. For $m = 0$, the committee is a president, king, or dictator. Parliaments or councils are examples for committees with $0 < m < n$. For $m = n$ the regime is a direct democracy. A committee member i votes for confiscation ($\zeta_i = 1$), or against it ($\zeta_i = 0$). All committee members vote and are not allowed to abstain. For simplicity we consider majority voting. (Alternatives will be briefly discussed below.) Confiscation takes place if $\sum_{j=1}^{2m+1} \zeta_j \geq m+1$.

Consider the committee members' payoffs as a function of their own and the other members' decisions. The surplus from confiscation is distributed on a per-capita basis among all citizens. Hence, the committee members' sum of benefits from confiscation $(2m+1)t$ is proportional to the committee size, but each committee member's benefit is t and independent of committee

[5] Note that the investment story is only one of many examples in which ex-post opportunism of a decision making body may lead to a hold-up problem of this kind.

[6] We could consider other decision rules, but the results are qualitatively similar, except for unanimity rules.

size.[7]

We shall assume that all committee members must vote, i.e., we disregard transaction costs of voting. Coming back to the investment example and the hold-up problem, confiscation means that the committee members voting for confiscation do not keep their promises. This may involve several types of cost to a committee member, depending on whether the vote is anonymous or not. If the vote is anonymous, voting for confiscation may cause feelings of guilt. If the vote is public, the committee member who votes for confiscation may, in addition, feel shame. In a public vote the committee member may also fear that others make inferences about how trustworthy the member is with respect to other activities, or about the member's moral standards.[8] In any case, given these feelings of guilt, shame or reputational concerns, we expect that individuals prefer voting against confiscation if they are not pivotal. The cost of 'not keeping the promise', or doing something "very dishonorable" as in Machiavelli's example, that is, the individual cost of voting for confiscation is denoted by c and the same for all committee members. We discuss generalizations of this below. In a first approach we also assume that c is independent of committee size and discuss generalizations later. Note that this fits well with the assumption that each committee member's benefit t from confiscation does also not depend on the size of the committee.

Note that there could be situations in which, instead of moral cost of voting for confiscation, the voters may feel some cost of voting against what is ex-post in the collective interest. Dictators, medium size committees or even very large committees will in this case simply vote unanimously for confiscation. Hence, in such situations, committee size does not make a difference. This highlights that large committees may yield commitment in some situations, but may work equally badly as dictatorship in other situations. We concentrate on the situations in which committee size does make a difference.

We can now write committee members' payoffs as a function of the vector

[7]This avoids biasing the results in favour of larger (more democratic) committees. If the committee can appropriate a larger share of the revenue for its own members, the results we obtain below would be strengthened.

[8]Whether the vote is anonymous or public matters for the outcome. This can be infered, for instance, from the existence of rules for parliaments and other committees that govern voting procedures and determine when and which vote has to be public or anonymous. Shame may also play a role for explaining the divergence between opinion polls and election outcomes (we are grateful to David deMeza for pointing this out to us).

of votes. A member i's payoff is

$$\pi_i = \begin{cases} t & \text{if } \sum_{j=1}^{2m+1} \zeta_j \geq m+1 \text{ and } \zeta_i = 0 \\ t-c & \text{if } \sum_{j=1}^{2m+1} \zeta_j \geq m+1 \text{ and } \zeta_i = 1 \\ 0 & \text{if } \sum_{j=1}^{2m+1} \zeta_j < m+1 \text{ and } \zeta_i = 0 \\ -c & \text{if } \sum_{j=1}^{2m+1} \zeta_j < m+1 \text{ and } \zeta_i = 1 \end{cases} \tag{1}$$

Given this payoff function, we can consider voting equilibria. The following results hold.

Proposition 1 *Let $m = 0$ (monarchy, presidential regime or dictatorship). There is a unique voting equilibrium with $\zeta_1 = 1$ if $t > c$ and $\zeta_1 = 0$ if $t < c$. Let $m > 0$. There is a (trivial) pure strategy equilibrium with $\zeta_j = 0$ for all $j \in \{1, ...(2m+1)\}$ in which no confiscation takes place. There are $\binom{2m}{m+1}$ further pure strategy equilibria if $t \geq c$ and no further pure strategy equilibria otherwise. Confiscation takes place in these equilibria and they are characterized by $\sum_{j=1}^{2m+1} \zeta_j = m+1$.*

Proof Each committee member prefers to vote against confiscation if he thinks that he is not pivotal and if $t > c$. The case $m = 0$ follows immediately. For $m > 0$, if less than m other committee members vote against confiscation, member j is not pivotal and, hence, votes against confiscation, and so for all members. This explains the trivial equilibrium. We now confirm that any vector of votes with $m+1$ votes for confiscation is an equilibrium if $t > c$. Consider i who votes against confiscation. Given that exactly $m+1$ other committee members vote for confiscation, i strictly prefers to vote against confiscation. Consider i who votes for confiscation. Given that m other committee members vote for confiscation, i compares the payoffs in rows 2 and 3 in (1) and prefers to vote for confiscation if $t \geq c$. Clearly, $t \geq c$ is a necessary condition for a committee member ever to vote for confiscation. Finally, we have to show that there are no other pure strategy equilibria. Suppose there are. Suppose there is an equilibrium with r votes for confiscation and $(2m+1-r)$ votes against it. If $r < m+1$, voting for confiscation is not optimal for these r committee members. Similarly, if $r > m+1$, given that there is a sufficient number of votes by other committee members, each committee member prefers to vote against confiscation. □

The asymmetric equilibria in which precisely $m+1$ members of the committee vote for confiscation require a great amount of coordination and are,

thus, difficult to achieve, particularly as each committee member prefers to belong to the group of voters who vote against confiscation. It is probably more reasonable to consider symmetric equilibria. In these equilibria each committee member randomizes and votes for confiscation with some probability p. These symmetric equilibria are characterized by

Proposition 2 *Symmetric (and un-correlated) voting equilibria in which each committee member votes for confiscation with the same probability are characterized by the condition*

$$t\binom{2m}{m}p^m(1-p)^m = c. \tag{2}$$

or by $p = 0$.

Proof The right-hand side of condition (2) determines a committee member's cost of voting for confiscation. The left-hand side of the condition is the committee member's benefit t in case of confiscation times the probability with which he is pivotal – that is, the probability with which precisely m other committee members vote for confiscation. Hence, condition (2) is the necessary and sufficient indifference condition for a fully mixed equilibrium. □

The results in Proposition 1 and 2 for given committee size m resemble the results in the literature on the problem of binary participation in the provision of discrete public goods without refund (see, e.g., Palfrey and Rosenthal, 1984). Indeed, the voting problem considered here and this problem are structurally equivalent; voting for the proposal has cost c and is the fixed positive contribution to the public good 'expropriation' that occurs if the number of contributions or votes establishes a majority. However, the size of the committee is a central additional characteristic in our framework, and we give much emphasis to the question how does committee size influence the uncoordinated equilibria.

Equation (2) may have multiple solutions for p. When facing such multiplicity, we select the payoff dominant equilibrium. There are at most three symmetric equilibria, the (trivial) pure-strategy equilibrium in which everybody votes against confiscation, and the two mixed equilibria when (2) has two real-valued solutions. Payoffs in the symmetric pure-strategy equilibrium are zero. Players' payoffs in any symmetric mixed-strategy equilibrium can be easily calculated by taking the expected payoff of voting against confiscation. Voting against confiscation gives t times the probability that confiscation takes place if all mix according to the equilibrium probability.

Hence, the payoff-dominant symmetric equilibrium is given by the largest real-valued p solving (2) and, if there is no real-valued solution, by $p = 0$. We define this payoff-dominant equilibrium as $p^*(m)$.[9]

The probability with which the confiscation takes place is, thus, given by

$$P(m) \equiv 1 - \sum_{i=0}^{m} \binom{2m+1}{i} p^*(m)^i (1 - p^*(m))^{2m+1-i}. \tag{3}$$

The approval probability $P(m)$ is equal to the probability with which all but i members of the committee vote for confiscation, with $i \leq m$. Now, $\binom{2m+1}{i} p^*(m)^i (1-p^*(m))^{2m+1-i}$ is the probability with which precisely i members of the committee vote for confiscation, and these probabilities are summed up and deducted from the total probability to obtain $P(m)$.

The comparative statics of the equilibrium probabilities p and P with respect to the size of the committee reveal whether confiscation becomes more or less likely as the committee size changes. The following holds:

Proposition 3 *The payoff-dominant symmetric equilibrium probability $p^*(m)$ is a (weakly) decreasing function in the committee size m. There is a critical finite m_0 at which $p^*(m) \geq 1/2$ for all $m < m_0$, and $p^*(m) = 0$ for $m \geq m_0$. The approval probability $P(m) = 0$ for $m \geq m_0$.*

Proof Let $\hat{p} = p^*(m+1)$ be the payoff dominant equilibrium with committee size $2m + 3$ which is determined by

$$\frac{c}{t} = \binom{2(m+1)}{m+1} \hat{p}^{m+1} (1 - \hat{p})^{m+1} \tag{4}$$

and $\widetilde{p} = p^*(m)$ be the payoff dominant equilibrium with committee size $2m + 1$ that is determined by

$$\frac{c}{t} = \binom{2m}{m} \widetilde{p}^m (1 - \widetilde{p})^m. \tag{5}$$

Note that

$$\binom{2(m+1)}{m+1} \hat{p}^{m+1} (1-\hat{p})^{m+1} = \frac{2(2m+1)}{m+1} \hat{p}(1-\hat{p}) \binom{2m}{m} \hat{p}^m (1-\hat{p})^m. \tag{6}$$

[9] We may also consider a change in c and how it affects this equilibrium confiscation probability. If the cost of voting for confiscation becomes smaller, this increases p^* as $t\binom{2m}{m}$ in (2) does not depend on c, and $p^m(1-p)^m$ is decreasing in p for $p > 1/2$. Hence, in the limit, for $c \to 0$, the mixed strategy equilibrium converges toward $p = 1$ for a finite committee size m.

As $\frac{2(2m+1)}{m+1}\hat{p}(1-\hat{p}) < 1$ for all $\hat{p} \in (0,1)$, this implies $\hat{p}(1-\hat{p}) > \widetilde{p}(1-\widetilde{p})$. This, together with $\widetilde{p}, \hat{p} \geq 1/2$ implies $\widetilde{p} \geq \hat{p}$. This establishes the first claim. For the second claim, notice that $\frac{c}{t}$ is a constant whereas the term $\binom{2m}{m}$ increases by a factor $2 + 2\frac{m}{m+1}$, when increasing m to $m+1$. The Binomial distribution converges to the normal distribution, and the probability that a voter is pivotal converges towards zero, even if $p = 1/2$. The critical m_0 is characterized by the first m for which

$$\frac{(2m)!}{m!m!}\frac{1}{2^{2m}} < \frac{c}{t}. \tag{7}$$

Hence, for sufficiently large m, $p = 0$ becomes the only equilibrium solution. In turn, $p(m) = 0$ implies $P(m) = 0$. □

The intuition of Proposition 3 is as follows. In a mixed strategy equilibrium, the expected benefit of voting for the collectively prefered outcome must just compensate for the individual sacrifice of voting for this outcome. If the committee becomes larger, for given probabilities of voting for the collectively prefered outcome, each member's chance of being pivotal is reduced, and this reduces a voter's expected benefit of voting for the collectively prefered outcome. To counterbalance this effect all other voters' probability of voting favorably must be reduced, as this increases the probability of being pivotal. However, there is a limit for this counterbalancing effect at $p = 1/2$. The mixed strategy equilibrium disappears when a further adjustment of p that could cause indifference for each player ceases to exist.

The proposition 3 is the main theoretical result in this paper. It suggests that committee size is a commitment device. For given benefits of collectively voting on default and given cost of guilt or shame, a default can be ruled out by a sufficiently large committee. Moreover, from (7) the following empirical prediction immediately follows:

Corollary *The critical minimum size m_0 of committees that rules out default is strictly increasing in the committee member's benefit t from a collective decision for default, and a decreasing function of individual moral cost c of guilt or shame from voting for default.*

Let us illustrate this with a numerical example. Figure 1 shows the two fully mixed equilibria for $t = 1$ and various values of c ranging from 0.005 to 0.32 as a function of (logarithmic) committee sizes. With small committees ($m < 8$, respectively $\ln(m) < 2$ in Figure 1) the equilibrium probability $p(m)$ in the payoff-dominant equilibrium is very large. Then, this probability slowly decreases until it has reached roughly 1/2. If committees get larger, the fully mixed equilibrium suddenly disappears and the unique symmetric

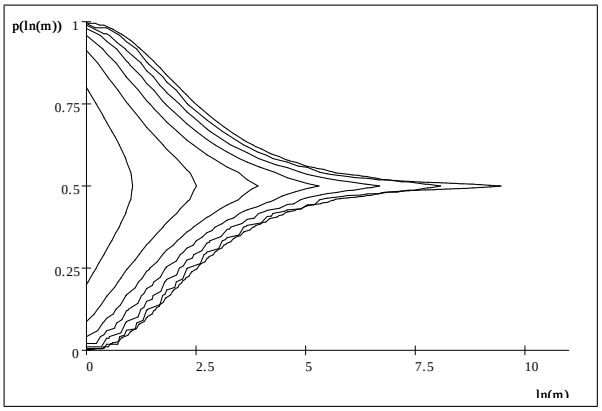

Figure 1: Equilibrium values of $p(\ln(m))$ for $t = 1$ and cost ranging from $c = 0.005$ (curve to the right side) to $c = 0.32$ (curve to the left side), where the scale along the x-axis is $\ln(m)$.

voting equilibrium is the one where everybody votes against confiscation. For $c = 0.005$ this is true already for the smallest committee of size 3, while for $c = 0.32$ a committee size of 2900 is needed to make the mixed strategy equilibrium disappear.

The hold-up problem is reduced the lower $P(m)$ is, and, hence, vanishes if the number of committee members becomes sufficiently large. The limit result in Proposition 3 shows that a sufficiently large size of the committee is sufficient to eliminate the threat of ex-post opportunistic voting outcomes.

3 Robustness

Some assumptions made in the previous section should be discussed.

Asymmetric cost. It was assumed that all members of the committee are homogenous. They have the same voting costs and the same benefits from a particular voting outcome. This assumtion was not only for simplicity, but also to higlight the fact that the results established here do not require heterogeneity of voters. However, it could be interesting to consider asymmetric cost and to confirm that the same type of mixed strategy equilibrium exists under asymmetric cost. Committee members may differ with respect to their cost, for instance, $0 \leq c_1 \leq c_2 \leq ... \leq c_{2m+1}$. This could be due to differences in their psychology, or in differences in their constraints that may determine these costs. For instance, investment in a reputation could be more valuable for committee members at the beginning of their career than for members

at the end of their career etc. Such differences make it easier for the committee to coordinate, for instance, on one of the asymmetric pure-strategy equilibria, for example, the one in which the $m+1$ committee members who have the lowest cost vote for the proposal. However, even with asymmetric cost, it is still true that each voter prefers the outcome in which he votes against the proposal, but at least $m+1$ other voters vote for the proposal, and this leads to similar mixed strategy equilibria as above, and to a similar limit result for large committees as in Proposition 3.

Other types of cost. As has been discussed above, committee members may feel other types of cost of voting for a particular policy as well. For instance, they may feel particularly miserable if they are pivotal and if their vote caused a particular outcome. Let this cost be d. Accordingly, the mixed strategy equilibria are characterized by the condition

$$t\binom{2m}{m}p^m(1-p)^m = c + d\binom{2m}{m}p^m(1-p)^m. \tag{8}$$

The left-hand side of (8) is the expected benefit of voting for the proposal. The right-hand side consists of the 'moral cost' of voting for the proposal, and the expected cost of being pivotal and causing the acceptance of the proposal. As can be seen by comparing condition 8) with (2), not much changes as long as $c < t - d$.

Further types of cost or benefits may also exist and have been discussed in the context of the framework of private (threshold) provision of a public good as in Palfrey and Rosenthal (1984). For instance, Güth and Nitzan (1997) draw attention on the possibility of a moral cost or a pleasure of free-riding that a player feels if and only if the public good is successfully provided, and consider the evolutionary stability of this cost or benefit in large populations, focussing on pure strategy equilibria. Further, the cost of voting for confiscation could be larger or smaller, depending on whether a voter is pivotal or not.

Our main result will typically not change if these additional types of cost exist: large committees face a major coordination problem and the mixed strategy equilibrium that does not require coordination will typically disappear if the committee becomes sufficiently large if committee members feel some own cost of voting for the collectively desirable outcome.

Qualified majorities. In Section 2 simple majority voting was considered. The results do not change qualitatively if a proposal must win more or less than half of the votes for being accepted, except for a unanimity rule. In the extreme case of an unanimity rule, there are at most two equilibria: the trivial equilibrium in which all voters reject the proposal and unanimous

approval.[10]

Endogenous cost. The cost of voting for the proposal may depend on the committee size. If $c = c(m)$, a sufficient condition for the limiting result in Proposition 3 is that $c(m) \geq \varepsilon > 0$ for all $m \geq m_1$ for some m_1. In this case ε replaces c in the proof of the limiting result.

Endogenous committees. Members of committees are often chosen, for instance, by appointment or election. As the voting outcome of the committee depends on its size m and the committee members' cost c, the selection of committee members is decisive for the voting outcome. If a constituency would like to commit itself firmly (to induce an *ex ante* optimal time-inconsistent policy), it can install a committee a sufficiently large committee. One may also consider self-selection of representatives of the constituency for the committee of a pre-determined size m. One should expect that voters with small c self-select into committees as they have low cost of serving on the committee.

4 Experimental evidence

We are not aware of any direct experimental tests of our above model. However, as discussed above, the second stage of the investment and voting game is equivalent to a game with private (threshold) provision of a public good (Palfrey and Rosenthal 1984). Several data sets that exist on this equivalent problem allow us to draw some inference about the empirical relevance of our theoretical results. The structural equivalence is not complete, however, particularly if one considers the various additional types of psychological costs and benefits in the voting game and in the standard step-level public goods game. As discussed, in the voting game, one may expect additional psychological cost from being pivotal if one votes for confiscation, whereas the public goods literature discusses the opposite type of psychological effects, generally expecting that contributors feel a 'warm glow' from contributing, and a particularly high warm glow in case a contributor is pivotal (see Offerman, Sonnemans and Schram 1996).

Let us neglect these psychology differences, and consider the bare bones of a step-level public-good game with M players. Each player has to decide between two alternatives: whether to contribute a fixed amount C to a public

[10] Under unanimity every player can veto a proposal. In some cases majority rules are combined with giving veto power to some players. For a theoretical treatment of voting in the presence of veto players see, for example, Winter (1996); for some empirical results Tsebelis (1999). In our model all players would vote against a proposal if one veto player does.

good, or to contribute zero. If the number of contributors reaches or exceeds a given number Q, the public good can and will be provided. The public good generates a benefit equal to t to all players. If Q or less individuals decide to contribute, the public good is not provided. The cost C is sunk and not refundable for each player, regardless of other players' contributions, and whether the number of contributions is sufficient for provision of the public good. This game is equivalent to the one discussed above, with C replacing c, M replacing $2m + 1$, and t being the individual benefit from successful provision of the public good.

Experimental evidence on this step-level public goods game supports the idea of coordination failure. Van de Kragt, Orbell and Dawes (1983), for instance, considered binary contribution threshold experiments. In their games each player in a group of 7 players decides whether to make a contribution of a pre-determined size, or not to contribute to a public good. The contributions are not refunded, regardless of how many players contributed. The public good is provided if at least Q players contribute, and the individual benefits from this public good are independent of the number of contributions, provided this number is at least Q. They consider $Q = 3$ and $Q = 5$. They find that even small groups of seven players frequently fail to coordinate if they are not allowed to communicate. With $Q = 3$, optimal provision occured in 45 percent of the experiments. The good was not provided in 27 percent of all cases and overprovision occured also in 27 percent of all cases. With $Q = 5$, the rate of optimal provision was 22 percent, whereas overprovision and underprovision occured with equal frequency of 39 percent.

Croson and Marks (2000) survey threshold public good games and estimate the success rate (equivalent to the $P(m)$ from above) as a function of the number of players (in our model $M = 2m + 1$) and the *step return* of the game, where the latter is defined in our model as $s = \frac{(2m+1)t}{(m+1)c}$, i.e., the ratio between the aggregate benefits from provision of the public good and the aggregate cost that accrue if the good is provided efficiently. They find the following relationship:[11]

$$P(n, s) = -4.4 + .12 \times s - .09 \times M. \tag{9}$$

Expressing s and M in terms of the variables of our models (m, t, and c) we

[11] We take the results from the regression (shown in their Table 2), plugging in the implicitly assumed values of the dummy variables included in their regression.

can rewrite (9) as

$$\begin{aligned} P(m,c,t) &= -4.4 + .12\frac{(2m+1)t}{(m+1)c} - .09(2m+1) \qquad (10) \\ &= -5.3 - 1.8m + .12\frac{(2m+1)t}{(m+1)c}. \end{aligned}$$

While it seems not particularly reasonable to compare the exact quantitative predictions of this linear model (that was estimated for small groups of players) with our theoretical predictions that hold for arbitrary numbers of players, it is important to notice that the qualitative predictions of our model are confirmed. The confiscation probability is increasing in the material benefits t and decreasing in the psychological costs c. Moreover, the coefficients estimated by Croson and Marks are all significant, so that these qualitative findings appear to be reliable.

5 Conclusion

Time consistent, ex-post opportunistic behavior of political decision bodies can generate hold-up problems. Constitutional rules that ban such behavior are often impracticable or impossible, even if they could be made binding. For instance, it would be required that a decision today has to define all actions and future decisions to be taken for all future contingencies, and this is a hopeless task. We suggest an alternative constitutional method to generate commitment. Decisions made by committees the size of which is determined on the constitutional level. Committee size is easily observable and can be enforced. We show that committee size determines (theoretically and experimentally) the degree of commitment. Default may be more desirable if the collective benefit of default is larger. Small committees are sufficient to rule out default if the collective benefit of default is small. The larger the colletive benefit of default, the larger is the committee size that is needed to rule out default. Accordingly, by the choice of committee size, perfect commit to *ex ante* optimal but time-inconsistent policies can be achieved. Hence, committee size is an important choice variable at the constitutional stage by which the desired amount of commitment can be influenced.

References

[1] Besley, Timothy, and Stephen Coate, 1997, An economic model of representative democracy, *Quarterly Journal of Economics*, 112(1), 85-114.

[2] Besley, Timothy, and Stephen Coate, 1998, Sources of inefficiency in a representative democracy: a dynamic analysis, *American Economic Review*, 88(1), 139-156.

[3] Croson, Rachel T.A., and Melanie Beth Marks, 2000, Step returns in threshold public goods: a meta- and experimental analysis, *Experimental Economics*, 2(3), 239-59.

[4] Dal Bó, Ernesto, 2002, Committees and supermajority voting: Balancing commitment and flexibility, mimeo.

[5] Fernandez, Raquel, and Dani Rodrik, 1991, Resistance to reform: status quo bias in the presence of individual-specific uncertainty, *American Economic Review*, 81, 1146-1155.

[6] Garfinkel, Michelle, and Jaewoo Lee, 2000, Political influence and the dynamic consistency of policy, *American Economic Review*, 90, 649-666.

[7] Gaubatz, Kurt Taylor, 1996, Democratic states and commitment in international relations, *International Organization*, 50, 109-139.

[8] Gradstein, Mark, 1999, Optimal taxation and fiscal constitution, *Journal of Public Economics*, 72, 471-485.

[9] Güth, Werner, and Shmuel Nitzan, 1977, The evolutionary stability of moral objections to free-ride, *Economics and Politics*, 9, 133-149.

[10] Howitt, Peter, and Ronald Wintrobe, 1995, The political economy of inaction, *Journal of Public Economics*, 56, 329-353.

[11] van de Kragt, John M. Orbell and Robyn M. Dawes, 1983, The minimal contributing set as a solution to public goods problems, *American Political Science Review*, 77(1), 112-122.

[12] Machiavelli, Nicolo, 1531/1989, *Discourses on the First Decade of Titus Livius*, in: Machiavelli, The Chief Works and Others, Volume I, Duke University Press, Durham and London.

[13] Messner, Matthias, and Matthias K. Polborn, 2003, Voting on majority rules, mimeo., University of Western Ontario.

[14] Monoson, S. Sara, and Micahel Loriaux, 1998, The illusion of power and the disruption of moral norms: Thucydides' critique of Perclean policy, *American Polictical Science Review*, 92, 285-297.

[15] Offerman, Theo, Joep Sonnemans, and Arthur Schram, 1996, Value orientations, expectations and voluntary contributions in public goods, *Economic Journal*, 106, 817-845.

[16] Palfrey, Thomas R. and Howard Rosenthal, 1984, Participation and the provision of discrete public goods: a strategic analysis, *Journal of Public Economics*, 24, 171-193.

[17] Persico, Nicola, 2004, Committee design with endogenous information, Review of Economic Studies, 71, 165-191.

[18] Persson, Torsten, and Guido Tabellini, 1994, Representative democracy and capital taxation, *Journal of Public Economics*, 55(1), 53-70.

[19] Plutarch, 75/1998, *Greek Lives: A Selection of Nine Greek Lives*, edited by Philip A. Stadter and translated by Robin A. Waterfield, Oxford University Press, Oxford.

[20] Tsebelis, George, 1999, Veto players and law production in parliamentary democracies: An empirical analysis, *American Political Science Review*, 93, 591-608.

[21] Tyran, Jean-Robert, 2002, Voting when money and moral conflict, an experimental test of expressive voting, mimeo., University of St. Gallen.

[22] Winter, Eyal, 1996, Voting and vetoing, *American Political Science Review*, 90, 813-823.

[23] Wintrobe, Ronald, 1990, The tinpot and the totalitarian: An economic theory of dictatorship, *American Political Science Review*, 84(3), 849-872.

[24] Wintrobe, Ronald, 2001, How to understand, and deal with dictatorship: an economist's view, *Economics of Governance*, 2(1), 35-58.