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ABSTRACT

Moral Cost, Commitment, and Committee Size

by Steffen Huck and Kai A. Konrad

Consider a committee that in the past has made a promise not to confiscate the profits from a foreign investor. After the investment has taken place, there is a material benefit if the committee decides to default on the earlier promise. But there are also some small moral costs for those who vote in favor of default. We show that in such situations small committees are more likely to default than large committees. Thus, constituencies can decide about *degrees* of commitment by choosing committee sizes appropriately. Experimental data confirms our predictions.

Keywords: Coordination, commitment, democracy, voting

JEL Classification: D71, D72, H77

ZUSAMMENFASSUNG

Moralische Kosten, Selbstbindung und die Größe von Komitees

Untersucht wird das Entscheidungsverhalten eines Komitees, das als politische Instanz mit Mehrheitsentscheidung über die mögliche Beschlagnahmung oder konfiskatorische Besteuerung des Anlagevermögens eines ausländischen Direktinvestors entscheiden kann und diesem Direktinvestor in der Vergangenheit vor dessen Investitionsentscheidung versprochen hatte, solche Maßnahmen nicht zu ergreifen. Nachdem die Investition erfolgt ist, kann das Komitee durch das Nichteinhalten des Versprechens einen materiellen Gewinn erzielen. Allerdings entstehen den Befürwortern des Nichteinhaltens (geringe) moralische Kosten. In diesem Zusammenhang zeigen wir, dass kleine Komitees ihr Versprechen mit höherer Wahrscheinlichkeit brechen als große Komitees. Der Grad der Selbstbindung des Komitees kann somit von den Wählern über die Größe des Komitees gesteuert werden. Wir belegen, dass die theoretischen Hypothesen über das Verhalten des Komitees durch Experimente bestätigt werden.

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 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 ("moral") costs for those who vote for it. 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—constituencies can decide about *degrees* of commitment by choosing committe sizes appropriately. This sheds some new light on the role of democratic institutions for the functioning of a constituency[2]

[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.

[2] In a different framework Olson (1993) argues that the conditions that are needed for efficient economic development are the same that are needed for a lasting democracy. In

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 in international relations. First, the multiple levels of democratic domestic 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.[3] 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.

some sense, his arguments can be rephrased by saying that the shadow of the future must loom large in order to prevent those in power from inefficent rent extraction.

[3] 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.

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. In this case coordination among voters is required, and 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]

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.

2 Default in committees

Consider an agent who 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. 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. 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 want to promise to the investor to confiscate only a fraction, and to leave an amount of the returns that is sufficient to make the investment just profitable. But there is a hold-up problem if the committee can revise its decision after the investment has been made. The committee may have made some promise to the investor earlier, but may now find it in the collective interest not to keep the promise and confiscate the returns. In this situation each committee member may face a trade-off. He prefers an election outcome *ex post* that leads to confiscation, but may feel some moral

[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.

cost of the individual vote for confiscation. He may prefer to vote against confiscation, particularly if there is still a majority voting for confiscation.

Consider a two-stage game in which an investment can be made in the first stage. If no investment is made, the game ends. If the investment is made, a committee decides in the second stage whether the returns are confiscated or not. Our analysis focuses on the committee decision in the second stage. We assume that, if confiscation occurs, the additionally confiscated revenue T 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. 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 size.[5]

Committee members' voting also involves costs. Several types of cost could be considered. 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 some cost to a committee member. For instance, the committee member may fear that others make inferences about how trustworthy the member is, or about the member's moral standards. Alternatively, the committee member might have internalized some feelings of moral guilt. In

[5]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*.

any case, 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.

We can now write committee members' payoffs as a function of the vector of votes. A member i's payoff is

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

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 4 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 pure strategy equilibria other than the ones in (i) and (ii). 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 $p^*(m)$.[6]

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

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

[6] 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.

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

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

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 $P(m) = 0$. $\square$

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.

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 ($k < 2$, $m < 8$) 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 voting equilibrium is the one where

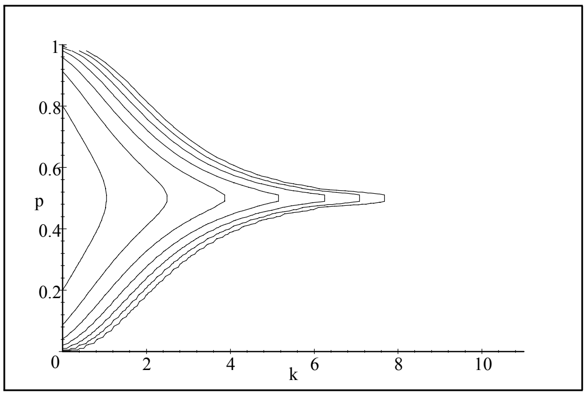

Figure 1: Equilibrium values of $p(m)$ for $t = 1$ and cost ranging from $c = 0.005$ (curve to the right side) to $c = 0.32$ (curve to the left side), where $k = \ln(m)$.

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.

Coming back to the problem of an investor who is concerned about the committee's incentives to confiscate all returns, the hold-up problem is reduced the lower $P(m)$ is, and 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 confiscation. It would be interesting to show that $P(m)$ is also monotonically decreasing in m in the range $m < m_0$.

This holds if

$$\begin{aligned}\sum_{i=0}^{m}\Big(\tfrac{(2m+1)!}{i!(2m+1-i)!}\left(\tfrac{(2m+3)(2m+2)}{(2m+3-i)(2m+2-i)}q^i(1-q)^{2m+3-i} - p^i(1-p)^{2m+1-i}\right)\\ +\tbinom{2m+3}{m+1}q^{m+1}(1-q)^{m+2} > 0\end{aligned} \tag{8}$$

where $p = p(m)$ as in (2) and $q = p(m+1)$. As $1/2 < q < p$, the left-hand side is larger than

$$\begin{aligned}Z \equiv (1-p)^{m+1}\sum_{i=0}^{m}\Big[\tfrac{(2m+1)!}{i!(2m+1-i)!}p^i(1-p)^{m-i}\\ \times\left(\tfrac{(2m+3)(2m+2)}{(2m+3-i)(2m+2-i)}(1-p)^2 - 1\right)\Big]\\ +\tbinom{2m+3}{m+1}p^{m+1}(1-p).\end{aligned} \tag{9}$$

This, in turn, can be solved numerically for a large range of m and p.

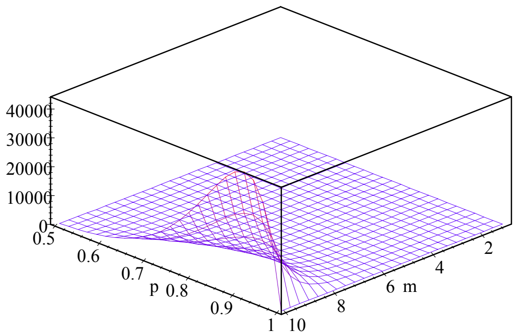

Figure 2: The value of Z as a function of p and m. (Notice that we restricted the plot such that only non-negative values of Z are displayed. The monotonicity of $P(m)$ thus follows by the observation that there is a Z-value for each point in the entire p–m plane.)

Figure 2 shows the numerical values of this term, suggesting that $P(m)$ is, indeed, monotononically decreasing in m.

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

$$t\binom{2m}{m}p^m(1-p)^m = c + d\binom{2m}{m}p^m(1-p)^m. \tag{10}$$

The left-hand side of (10) 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 10) 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.[7]

[7] 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.

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. If the constituency wants to keep an investor just happy (to solve a hold-up problem), it can choose a somewhat smaller committee size inducing a $P(m)$ that leaves just enough expected rent for the investor to invest. Finally, if the consitituency wants full flexibility and is willing to sacrifice *ex ante* optimal strategies, it can install very small committees or even appoint a single decision maker.

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 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:[8]

$$P(n, s) = -4.4 + .12 \times s - .09 \times M. \tag{11}$$

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

[8]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 (11) as

$$P(m,c,t) = -4.4 + .12\frac{(2m+1)t}{(m+1)c} - .09(2m+1) \tag{12}$$
$$= -5.3 - 1.8m + .12\frac{(2m+1)t}{(m+1)c}.$$

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 decreasing in the committee size, increasing in the ratio 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

We show that committee sizes determine degrees of commitment. Small committees are more likely to default on earlier promises than large ones. Sufficently large committees can perfectly commit to *ex ante* optimal but time-inconsistent policies. But constituencies might also choose a committee size that induces a probabality between 0 and 1 for default. This may be optimal to resolve hold-up problems. Facing a certain probability of default a (foreign) investor might just decide to invest because his expected returns are slightly bigger than his costs. Thus, medium sized committees might be able to extract (in expectation) the full rent from foreign investments.

The implications of these results are potentially far reaching. The property rights issue is one of the most important problems in political economy. And it is perhaps not by co-incidence that the prototype country of direct democracy, Switzerland, has been considered one of the safest places to store money on secret bank accounts, and one of the countries with the lowest tax rates on capital returns. The coordination problem in democracies that reduces the scope and the probability for effective opportunistic default may contribute to an explanation for this evidence.

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