

Reciprocity and resistance to comprehensive reform

Urs Fischbacher · Simeon Schudy

Abstract Comprehensive reforms often fail, despite being beneficial to society. Politicians may block comprehensive reforms in an attempt to form vote trading coalitions in which they benefit from a piecemeal reform at the expense of others. Because formal commitment devices for vote trading are frequently missing, trust and reciprocity among legislators can play an important role for vote trading. We investigate in a laboratory experiment whether legislators will impede comprehensive reforms in an attempt to form vote trading coalitions even if formal commitment devices for vote trading after reform failure are missing. We find that open ballots allow for vote trading without commitment, based on trust and reciprocity. In turn, legislators frequently reject efficient comprehensive reforms in such institutions.

Keywords Vote trading · Comprehensive reform · Committee voting · Experiment

1 Introduction

Comprehensive reforms often fail or become piecemeal during the preparatory phase of legislation. Such resistance to comprehensive reforms has been explained by uncertainty about outcomes of reforms (see, e.g., Fernandez and Rodrik 1991; Cason and Mui 2003), the existence of veto players (see, e.g., Tsebelis 2002; Kagel et al. 2010), interest groups or wars of attrition (Alesina and Drazen 1991; Saint-Paul 2002), social preferences (e.g., inequality aversion) which may hinder societies in implementing efficiency increasing but equality reducing reforms (Paetzel et al. 2012) and psychological constraints such as confirmatory bias (Samuelson and Zeckhauser 1988; Rabin and Schrag 1999).¹ We provide a different

¹For a comprehensive survey on resistance to reform see also Heinemann (2004).

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rationale for resistance to comprehensive reforms which has so far been neglected: trust and reciprocity among legislators, which allow for vote trading among legislators, without commitment devices, after comprehensive reform failure.

Facing a comprehensive reform, legislators in favor of a subset of individual bills included in the comprehensive reform will be willing to impede it if they expect their favorable subset to be implemented by a vote trade after comprehensive reform failure. For selfish legislators, such a vote trade requires formal commitment devices. On the contrary, if legislators trust and reciprocate, commitment devices for vote trading will not be necessary to trade votes. The aim of this paper is thus twofold: First, we investigate institutional circumstances that facilitate trust and reciprocity among legislators and in turn vote trading. Second, we study how vote trading based on trust and reciprocity affects resistance to efficient comprehensive reforms.

While vote trading can be observed in real world policy making (see, e.g., Stratmann 1992) the determinants of vote trading without commitment, for instance trust and reciprocity, are difficult to identify with real world data. Legislators may be involved in individual reputation building, favor specific vote trading partners or vote under voting procedures that allow for long-term relations with potential vote trading partners. To restrict the determinants for vote trading to trust and reciprocity and thereby exclude any alternative reasons for vote trading, we investigate vote trading in a laboratory experiment.

The aim of our experiment is to simplify the complex procedures of real world policy making to the basic features of voting institutions. The experiment allows us to manipulate the transparency of the voting institution and thereby vary the extent to which legislators may trust and reciprocate. Further, the experimental setup offers the possibility to model powerful legislators (i.e., veto players), who are nevertheless equally attractive vote trading partners after reform failure. The experimental approach also permits us to control for individual reputation building possibilities as well as for the knowledge about others' preferences.

In our experiment, a three member committee votes on an efficient comprehensive reform comprising three independent bills. The approval of each individual bill is efficient, but only preferred by a minority. Members vote on the comprehensive reform using unanimity rule. Thus, we model each legislator as a powerful veto player. If the comprehensive reform fails, the committee may still pass all or a subset of the bills in a sequential bill-by-bill voting procedure. In the sequential voting procedure the committee votes independently on each bill under simple majority rule. This means each bill can be accepted or rejected and each voter is an equally attractive vote trading partner. Because each bill is only preferred by a minority, vote trading becomes necessary to pass bills. In our setup, standard economic theory predicts no bill to be passed in the sequential procedure without commitment devices for vote trading. Consequently, in a subgame perfect equilibrium selfish legislators vote for the comprehensive reform. However, a vast amount of theoretical (see, e.g., Rabin 1993; Levine 1998; Bolton and Ockenfels 2000; Charness and Rabin 2002; Dufwenberg and Kirchsteiger 2004; Falk and Fischbacher 2006; Cox et al. 2007) and experimental work (e.g., Fehr et al. 1998; Fehr and Gächter 1998; Charness and Rabin 2002; Falk et al. 2008; Dohmen et al. 2009) has underlined the importance of reciprocity in human interactions. People reward kind actions and punish unkind actions. Humans not only reciprocate, but also trust in reciprocal behavior by others (see, e.g., Berg et al. 1995; McCabe et al. 1998; Strassmair 2009). If legislators trust in others' reciprocity in our setup, legislators will also expect vote trading on individual bills to be possible after reform failure, even without commitment. In turn, resistance to comprehensive reform may emerge.

The importance of trust and reciprocity for vote trading on individual bills after reform failure may crucially depend on the transparency of the voting procedure *ex post*. If the voting procedure provides information on each legislator's vote (open ballot), legislators may

identify their potential vote trading partners. If, instead, information on individual voting behavior is missing (secret ballot), it will be impossible to direct rewards to specific trading partners. We study resistance to comprehensive reform with both institutional settings, open and secret ballots, with the possibility of voting for a comprehensive reform.

We find that transparency in the sequential voting procedure is crucial for vote trading based on trust and reciprocity. In the open ballot treatments of our experiment we frequently observed vote trades in which two legislators passed their preferred bills at the expense of the third legislator. In the secret ballot treatments, vote trading based on trust and reciprocity turned out to be difficult. Vote trading possibilities in the open ballot treatment were sufficient to cause resistance to the efficient comprehensive reform. Legislators who expected vote trading to be possible (and beneficial to them) strategically impeded comprehensive reforms when the sequential voting procedure was transparent. Thus, an imperfect device for vote trading, namely a transparent sequential bill-by-bill voting procedure, was sufficient to cause resistance to comprehensive reform. In contrast, secret voting procedures (i.e., wherein individual voting behavior is not observable) reduced legislators' trust and, in turn, resistance to comprehensive reform.

Discussion of the welfare effects of vote trading based on the seminal work of Tullock (1959) has been extensive. Buchanan and Tullock (1962) argue that vote trading allows for the representation of degrees of intensities of preferences: Legislators can trade votes on issues for which their preferences are relatively weak against votes on issues for which their preferences are relatively strong. Thus vote trading is mutually beneficial to those involved in the trade. Brams and Riker (1973) point out that although each vote trade may be beneficial to traders, there is a risk that third parties not involved in the trade bear a substantial share of the cost involved in the respective trade. When the cost for third parties exceeds the benefits from trades, subsequent vote trades may lead to a situation under which vote trades eventually make everyone worse off (the paradox of vote trading). McKelvey and Ordeshook (1980) were the first to test Brams and Riker's paradox of vote trading experimentally. They observe the vote trading patterns predicted by Brams and Riker in a series of experiments with three- and five-person committees and a face to face communication environment with formal commitment devices for bilateral vote trades. However, in some of their experiments, committee members were allowed to cancel vote trades when all members involved in trading agreed to do so. Consequently, Pareto-dominated outcomes eventually were replaced by canceling all trades under unanimous agreement or by a majority coalition implementing its preferred outcome.² In contrast to the study by McKelvey and Ordeshook (1980), our contribution focuses on the impact of vote trading in the absence of commitment devices. Our subjects could not communicate, nor was there any possibility to sign agreements on the disposition of bills. They had no commitment devices at hand and cancellation of trades was not possible. Hence, we demonstrate that legislators can succeed in vote trading even when formal commitment devices and communication possibilities are missing. Legislators trust in their counterparts' reciprocity and vote for bills contrary to their (induced) preferences. Transparency of the decision making procedure allows legislators to observe who supports them and thus increases trust in others' reciprocity. In turn, when the alternative voting procedure was transparent, vote trading occurred and resistance to the comprehensive reform was profitable for those involved in trading.

²McKelvey and Ordeshook also ran treatments in which any majority of participants could agree on passing or failing bills by signing an agreement card (with unrestricted discussion beforehand). In these treatments they mainly observe fair outcomes in three-player games and support for the competitive solution in five-player games.

Since the aim of our experimental setup was to simplify the complex procedures of real world policy making to the basic features of voting institutions, we consider our results to be only a first step in understanding how trust and reciprocity affect voting behavior in political institutions. So far we modify only one particular aspect of the political process exogenously, namely transparency. Nevertheless, we note that our design may be easily extended to further important aspects of the political process. In the concluding section of this paper we provide several potential extensions that may be introduced to our design in the future.

2 Experimental design

In the experiment, subjects form three-member committees and decide on an efficient comprehensive reform. The comprehensive reform includes three individual bills. Each bill is efficient, but preferred by only one member of the committee. A committee member's preferred bill yields six additional points for herself, whereas the other two members of the committee incur a loss of two points each. Thus, if an individual bill is passed, the gross payoff will increase by two points. Because only one participant of the group gains from each individual bill, each individual bill is disadvantageous to a majority of the group. Table 1 shows how each bill affects the participants' payoffs. The participants are informed about both their own and their counterparts' payoffs.³ If the comprehensive reform is approved, all bills will be implemented, i.e., each participant receives two additional points. Passing the comprehensive reform requires unanimity and we do not display information on who vetoes the comprehensive reform. By doing so, we model powerful legislators (i.e., veto players) when it comes to comprehensive reforms, who nevertheless are equally attractive vote trading partners after reform failure. Further, we minimize fear of revenge as a reason to accept the comprehensive reform.

If at least one member vetoes the comprehensive reform, the committee will decide sequentially on the three individual bills under simple majority rule. We decided for a sequential procedure because it allows us to study the implications of reciprocal behavior among committee members for vote trading in a controlled environment. In the sequential bill-by-bill procedure, each bill can be passed or not passed. First, all committee members simultaneously cast their votes on the first bill. Then, we inform the committee about the outcome of the vote. Second, each member casts her vote for the second bill. The second vote is displayed and the group decides on the third bill. Eventually, the outcome of the third vote and the resulting payoff changes are displayed.

To test whether trust in others' reciprocity leads to resistance to comprehensive reform, we vary the information about other individuals' votes in the bill-by-bill voting procedure.

Table 1 Bills and resulting payoff changes

	Bill A	Bill B	Bill C
Member A	+6	-2	-2
Member B	-2	+6	-2
Member C	-2	-2	+6

³We do so in order to abstract from additional reasons affecting coalition formation such as over-representation of own preference intensities (see, e.g., Myerson and Satterthwaite 1983; Casella 2005; Jackson and Sonnenschein 2007; Engelmann and Grimm 2012).

Table 2 Treatments, sessions and matching-groups

Treatment	# Subjects	# Sessions	# Matching groups
Comprehensive reform and open ballot (OpenBallotCR)	63	3	5
Comprehensive reform and secret ballot (SecretBallotCR)	51	2	4
No Comprehensive reform and open ballot (OpenBallotNoCR)	51	2	3
No Comprehensive reform and secret ballot (SecretBallotNoCR)	54	2	3

Transparency allows legislators to observe individual voting behavior and thereby allows for directed reward. In turn, we suppose transparency increases trust in others' reciprocity. The committee either votes in a transparent bill-by-bill voting procedure (open ballot), in which individual voting behavior is observable, or in a secret ballot, where only the outcome of each vote is displayed (secret ballot).

Before committee members decide on the comprehensive reform, we inform them about the alternative voting procedure and about the (random) order of bills in the alternative procedure. This allows us to infer committee members' reaction to information about potential gainers and losers from each procedure. As further controls, we run additional treatments without the possibility of agreeing on a comprehensive reform. In these treatments the committee decides on the three bills either in an open (OpenBallotNoCR) or secret (SecretBallotNoCR) bill-by-bill voting procedure with simple majority rule. We can thus investigate the effect of transparency on trust in others' reciprocity in a controlled environment and test whether the failure of a comprehensive reform affects trust and reciprocity among committee members.

We repeat the game for 12 periods to allow for learning and changes of voting behavior over time. In each period, each participant is assigned randomly to a group of three participants (stranger matching). The random matching procedure excludes individual reputation building. In sessions with at least 24 subjects we divided subjects into two separate matching groups. Table 2 summarizes the number of subjects, sessions and treatments in detail. None of the subjects participated in more than one session.

Each subject sat at a randomly assigned and separated PC terminal and was given a copy of instructions.⁴ A set of control questions ensured the understanding of the game. If any participant repeatedly failed to answer correctly, the experimenter provided an oral explanation. No form of communication was allowed during the experiment. We conducted all sessions at the LakeLab (University of Konstanz, Germany). The data were collected over nine sessions, with 219 participants in total. Participants received a show-up fee of two euros (\$2.40 at that time). The experiment took about one hour and 15 minutes; average income (including the show-up fee) was about 14.40 euros (\$17.30). The experiment was programmed and conducted using z-Tree (Fischbacher 2007). We recruited participants using the online recruiting system ORSEE (Greiner 2004). Participants were part of the LakeLab subject pool, including undergraduate and graduate students from all fields of study.

⁴A copy of translated instructions can be found in the working paper version of this article at http://www.twi-kreuzlingen.ch/uploads/tx_cal/media/TWI-RPS-051-Fischbacher-Schudy-2010-05.pdf.

3 Behavioral predictions

3.1 The sequential bill-by-bill voting procedure

Committees comprised of selfish members will vote down all bills in the sequential bill-by-bill voting procedure if commitment devices for vote trading are missing. This holds irrespective of whether the voting procedure is transparent or not. However, if legislators expect their counterparts to reward support (with a sufficiently high probability⁵) they will court reward by voting in favor of bills preceding their own bill on the sequential voting agenda. Assuming, first, that legislators are reciprocal and do not support bills preferred by legislators who voted down their own preferred bill, and, second, that legislators do not treat counterparts about whom they have the same behavioral information differently, the approval of the first bill is weakly more likely than the approval of the second and third bill (Proposition 1).⁶ Assuming additionally that the legislator, who prefers the last bill on the agenda does not vote more frequently for the first bill than the legislator preferring the second bill, it follows that the approval of the second bill is weakly more likely than the approval of the third bill (Proposition 2).⁷

3.2 The comprehensive reform

Standard economic theory predicts that the committee will approve the efficient comprehensive reform because committees comprised of selfish members will vote down all bills in the alternative sequential bill-by-bill procedure. For resistance to reform to be caused by something other than decision errors, at least one legislator needs to expect another legislator to vote for her bill in the sequential bill-by-bill voting procedure. If legislators indeed expect reciprocal behavior by their counterparts with a sufficiently high probability (such that counterparts are willing to vote for bills preceding their own bill on the alternative sequential bill-by-bill agenda), it will be worthwhile to veto the comprehensive reform. As explained above, approval of the first bill is weakly more likely than approval of the second or third bill on the alternative agenda. In addition, the probability of a veto is (weakly) higher for legislators preferring the first bill than for legislators preferring the second or third bill on the agenda.

3.3 Transparency and reform failure

Standard economic theory predicts that the committee will approve the efficient comprehensive reform irrespective of transparency in the alternative bill by bill voting procedure. Similarly, if voting for another legislator's bill is expected to result from decision errors, approval will occur irrespective of transparency and so will resistance to reform. If voting for another legislator's bill instead is expected to result from other legislators courting for rewards, and the probability of reward depends on transparency, resistance to reform will depend on transparency as well. We consider it as plausible to assume that because

⁵For a risk-neutral subject, the probability of reward p_r is sufficiently high if $p_r > 1/3$ because voting for another's bill costs two points whereas reward yields six additional points.

⁶The proof of this proposition can be found in Appendix A.

⁷Proof of Proposition 2 can be found in Appendix B. Note also that due to the random matching procedure, there is no incentive for individual reputation building across periods, which might induce any additional motives for supporting monetarily unfavorable reforms.

transparency allows subjects to observe individual voting behavior, subjects expect a higher probability of reward in the open ballot treatments. Consequently, we expect legislators to trust more in their counterparts, i.e., we expect votes for bills preceding one's preferred bill on the alternative bill-by-bill agenda to occur more frequently in the open ballot treatments, in which the bill-by-bill voting procedure is transparent. Resistance to the comprehensive reform is thus also more likely to occur in OpenBallotCR.

4 Results

To understand why some members may veto the comprehensive reform it is necessary to shed light on the behavioral pattern in the alternative bill-by-bill voting procedures. Therefore, we will first discuss the effects of transparency on voting behavior in the sequential bill-by-bill voting procedure and, second, present the results with respect to resistance to comprehensive reform.

4.1 Trust and reciprocity in the sequential bill-by-bill voting procedure

Committee members in our experiment frequently vote for monetarily unfavorable bills. Figure 1 illustrates acceptance rates of monetarily unfavorable reforms in the bill-by-bill voting procedure for OpenBallotCR and SecretBallotCR, after the failure of the comprehensive reform, as well as for treatments OpenBallotNoCR and SecretBallotNoCR, in which no comprehensive reform was available. Each column represents the share of members voting for a reform bill that is monetarily disadvantageous to them. In the open ballot treatments (OpenBallotCR and OpenBallotNoCR), the earlier a bill is voted on in the bill-by-bill procedure, the higher is the probability of its approval. For the first bill two committee members have an incentive to court for positive reciprocity toward members preferring the bills second and third on the agenda. When voting on the second bill, the member in favor of the first bill has a strong monetary incentive to reject the second bill whereas the member preferring the third bill still has an incentive to vote for the second bill as long as she expects to be rewarded by the member preferring the second bill. Consequently, the actual approval rate for the second bill is clearly lower than for the first. The same logic applies to the third bill, which is clearly less frequently accepted than the first or second bill.

We observe 67 % of members voting for the first bill in OpenBallotNoCR even though they incur a loss from the approval of this bill, and 40 % for the second bill. In SecretBallotNoCR only 35 % vote for the first bill and 22 % for the second. The regressions in

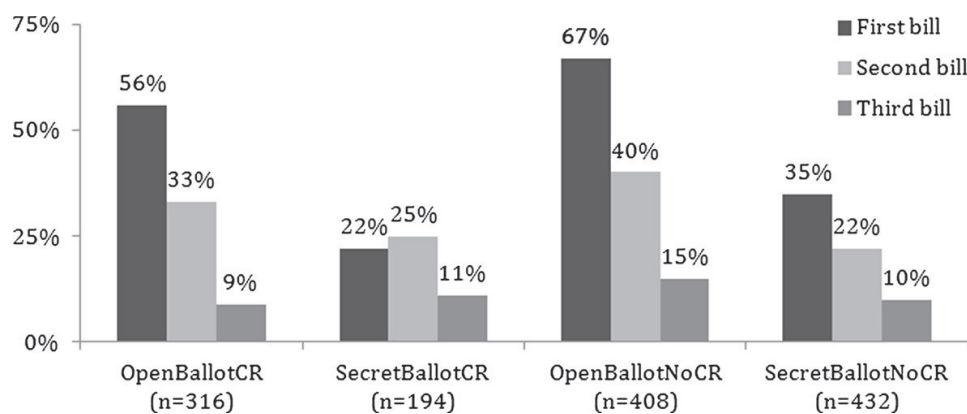


Fig. 1 Share of members accepting monetarily unfavorable bills in NoCR and CR treatments (after reform failure)

Table 3 Transparency and the acceptance of monetarily unfavorable reforms

Dep. var.: acceptance of . . .	Probit-marginal effects (robust std. errors)			
	CR treatments: after failure of CR		No CR treatments	
	. . .first bill	. . .second bill	. . .first bill	. . .second bill
Period-1	−0.0250*	−0.0121	−0.00484	−0.00964
	(0.0134)	(0.0141)	(0.0106)	(0.00868)
Transparency	0.261***	0.116	0.281***	0.145***
	(0.0983)	(0.0752)	(0.0208)	(0.0423)
Transparency × (Period-1)	0.0185	−0.00434	0.00901	0.00743
	(0.0164)	(0.0165)	(0.0118)	(0.00967)
Pseudo R^2	0.0927	0.0163	0.0791	0.0347
Number of observ.	510	510	840	840
Std. err. adjusted for # clusters	9	9	6	6

* p -val. < 0.10, ** p -val. < 0.05, *** p -val. < 0.01

Table 3 show that transparency, i.e., information on individual voting behavior, increases the individual acceptance of the first reform significantly.⁸ Transparency also increases the acceptance of the second bill statistically significantly in the NoCR treatments but insignificantly in the CR treatments. The acceptance of the third bill by members preferring earlier bills is not affected by transparency.⁹ We summarize this finding in Result 1.

Result 1 Transparency increases the probability of acceptance of early bills (first and second) in the sequential bill-by-bill voting procedure.

In order to understand whether transparency increases reward, trust in others' reciprocity, or both, the further analysis focuses on those two motives across treatments. In the open ballot treatments, *reward* refers to a situation when a committee member recompenses her helping counterpart by accepting a bill favored by that member. In the secret ballot treatments, committee members cannot identify supporters. If one's preferred bill is passed, voting for an unfavorable subsequent bill will refer to *reward* with respect to the group. In order to make *reward* in the open and secret ballot treatments comparable, we focus on the share of committee members who accept at least one subsequent bill, provided that their preferred bill is approved. With respect to trust in others' reciprocity, we draw conclusions from the acceptances of preceding but monetarily unfavorable bills. We understand trust as a behavior based on an optimistic belief, namely based on the belief of reward by one's counterpart. We use the probability of the acceptance of at least one unfavorable preceding bill as a measure

⁸The number of observations in Table 3 is calculated as follows: In OpenBallotCR reform failure occurred in 158 out of 252 cases. In SecretBallotCR reform failure occurred in 97 out of 204 cases. Thus in total there exist 255 situations in the CR treatments in which two subjects can cast a vote for an unfavorable bill which yields $(2 \times 255) = 510$ observations. For the NoCR treatments the number of observations can be easily derived from the number of subjects $(51 + 54 = 105)$. Two-thirds of 105 subjects make a decision in 12 periods which yields a total of 540 observations. Note further that we cluster on the matching groups in order to control for players' experience.

⁹In order not to crowd the table unnecessarily we do not here include the regressions results for the third bill.

Table 4 Share of members rewarding/trusting

Treatment	<i>Reward:</i> Share of members accepting at least one subsequent unfavorable bill when own bill is approved	<i>Trust:</i> Share of members accepting at least one preceding unfavorable bill
OpenBallotCR	0.25	0.66
SecretBallotCR	0.18	0.37
OpenBallotNoCR	0.30	0.75
SecretBallotNoCR	0.24	0.41

of trust. We are aware that efficiency concerns might also affect this probability because efficiency seekers will always vote for all bills. However, our data suggest efficiency concerns to be of minor importance. Only five percent of subjects vote for an unfavorable bill when their preferred bill failed.¹⁰ Further efficiency concerns should not vary significantly across treatments and thus cannot explain treatment differences in the probability of the acceptance of at least one unfavorable preceding bill.

Table 4 summarizes the share of members rewarding (accepting at least one subsequent unfavorable bill after the approval of one's own bill) and trusting in others' reciprocity (accepting at least one preceding bill) for the four treatments. The share of members rewarding their counterparts is slightly higher in transparent than in secretive procedures. Twenty-five percent of members reward their counterparts in OpenBallotCR, 18 % do so in SecretBallotCR, 30 % do so in OpenBallotNoCR and 24 % in SecretBallotNoCR. In open ballot treatments a substantially larger share of members trusts in others' reciprocity. In OpenBallotCR 66 % of members accept preceding bills detrimental to their induced preferences; in SecretBallotCR only 37 % do so. In OpenBallotNoCR this share amounts to 75 % whereas in SecretBallotNoCR it is only 41 %. Using Probit regressions controlling for the development of choices over time (Table 5) we find that transparency increases reward and trust. Further it becomes clear that the probability of reward decreases over time.¹¹ We summarize our finding in Result 2.

Result 2 Transparency increases trust and reciprocity.

4.2 Resistance to reform

We are now ready to turn to our main research question, namely whether trust in others' reciprocity is sufficient to induce resistance to comprehensive reform. Result 1 makes clear that vetoing a comprehensive reform is most attractive for members preferring the first bill on the alternative agenda when the alternative bill-by-bill procedure is an open ballot. We observe that committee members who prefer the first bill on the alternative agenda veto the comprehensive reform in 47 % of cases in OpenBallotCR and 25 % in SecretBallotCR.

¹⁰This share has to be considered as a lower bound for efficiency concerns, because not accepting subsequent bills after one's own bill failed can be caused by negative reciprocity too.

¹¹To control for possible end-game effects, we also ran the regressions in Table 5 including a last period dummy. For both, *reward* and *trust*, the last period dummy is negative, but statistically insignificant. The coefficient of transparency is robust. For *reward*, the time trend variable is still negative but statistically insignificant. The coefficient of the interaction term (Period-1) \times Comprehensive Reform Treatment is robust.

Table 5 Transparency, reward and trust in others' reciprocity

Probit (robust std. errors)	Dependent variable	
	<i>Reward</i> (Probability of the acceptance of at least one unfavorable subsequent bill when own bill is approved)	<i>Trust</i> (Probability of the acceptance of at least one unfavorable preceding bill)
Comprehensive reform treatment	-0.0743 (0.170)	0.0629 (0.164)
Transparency	0.292** (0.148)	0.755*** (0.103)
Period-1	-0.0317* (0.0183)	-0.00937 (0.0291)
Comprehensive reform treatment × transparency	0.0647 (0.227)	-0.0823 (0.236)
Comprehensive reform treatment × (Period-1)	-0.0299* (0.0155)	-0.0352 (0.0266)
Transparency × (Period-1)	-0.0129 (0.0190)	0.0193 (0.0279)
Constant	-0.559*** (0.0368)	-0.165*** (0.0482)
Number of observ.	814	1,350
Pseudo R^2	0.0220	0.0762
Prob > X^2	0.000	0.000
Std. err. adjusted for # clusters	15	15

* p -val. < 0.10, ** p -val. < 0.05, *** p -val. < 0.01

Members in favor of later bills on the alternative agenda do so in about 16 % of cases in OpenBallotCR and 20 % in SecretBallotCR,¹² resulting in comprehensive reform failure in 64 % of cases in OpenBallotCR and 48 % in SecretBallotCR.¹³ The regression results in Table 6 make clear that members preferring the first bill on the alternative agenda expect profitable vote trades to be possible when the sequential alternative procedure is transparent, and thus impede the comprehensive reform. Members preferring later bills mainly opt for the comprehensive reform and are not affected by the transparency of the alternative voting procedure. We summarize this finding in Result 3.

Result 3 Legislators impede comprehensive reforms when they anticipate profitable vote trading possibilities on the basis of trust and reciprocity.

Using actual probabilities, the expected payoff terms from blocking the comprehensive reform for a member preferring the first bill amounts to 7.5 points in OpenBallotCR, whereas

¹²The latter difference is not statistically significant (Probit with robust standard errors, p -val. > 0.10).

¹³The latter difference is statistically significant (Probit with robust standard. errors, p -val. < 0.10).

the acceptance of the package yields only 6 points. Thus, vetoing behavior by members preferring the first bill is profitable in the open ballot procedure (OpenBallotCR). The expected payoff terms from resistance to comprehensive reform in the secret ballot treatment (Secret-BallotCR) is 5.96, which is slightly lower than the payoff of 6 points for comprehensive reform. Thus, impeding the comprehensive reform in the secret ballot treatment does not pay off for members preferring the first bill. The same holds for members preferring later bills on the agenda. The expected payoffs terms from vetoing the package for members preferring the second bill (third bill) are 5.37 (2.27) in OpenBallotCR and 4.89 (3.11) in SecretBallotCR, i.e., these members have no monetary incentive to impede the comprehensive reform. Why do members preferring the first bill succeed in vote trading after they block the comprehensive reform? First note that in expected terms it is not worthwhile for the second beneficiary to support the first bill. However the expected payoff from voting for the first bill (for the member preferring the second bill) is only 0.08 points lower than the expected payoff from voting against the first bill. By supporting the first bill, a member preferring the second bill loses two points with certainty but receives a reward of six points by the member preferring the first bill with a probability of 35 %. Without supporting the first bill she receives no support from the member preferring the first bill. Additionally, voting for the first bill increases the probability of support for the second bill by the third beneficiary from 36 % to 48 %.¹⁴ Due to the small differences in expected payoffs, it is difficult for second beneficiaries to judge whether they gain or lose from voting for the first bill. Also, second beneficiaries may perceive voting for the first bill to be a “gamble” in which errors are not very costly.

Figure 2 indicates that members preferring the first bill on the alternative agenda change their behavior over time. In open ballot treatments resistance to reform increases from about 20 % in early periods to about 70 % in late periods. The regression in Table 7 confirms that members preferring the first bill on the agenda learn to block the comprehensive reform when facing a transparent voting procedure whereas resistance to reform remains constant in the secret ballot treatment.

Result 4 Legislators whose favorable bill is first on the alternative bill-by-bill agenda learn that resistance to comprehensive reforms pays off.

Although we did not display individual voting decisions for the comprehensive reform, one may expect negative reciprocity (or a loss in trust) towards those legislators who had the strongest incentive to block the comprehensive reform. Indeed, participants seemed to be aware that in the open ballot treatment (OpenBallotCR) the beneficiaries of the first bill on the agenda were most likely to impede the comprehensive reform. As Fig. 1 indicates, the support for the first bill by members preferring the second or third bill is significantly stronger in the NoCR treatments than in the CR treatments after comprehensive reform failure.¹⁵ When the comprehensive reform failed, members in favor of the comprehensive reform voted less frequently for the first bill whereas they voted more frequently for the second and third bills (see Table 8). Negative reciprocity (or a loss in trust) towards the member preferring the first bill did not increase over time and its quantitative effect on actual approval rates was small. Thus, beneficiaries of the first bill on the agenda still had an incentive to impede the comprehensive reform.

¹⁴We cannot infer whether the latter increase is due to positive signaling or because members preferring the third bill expect the second bill to be passed anyway and therefore have nothing to lose by voting for the second bill.

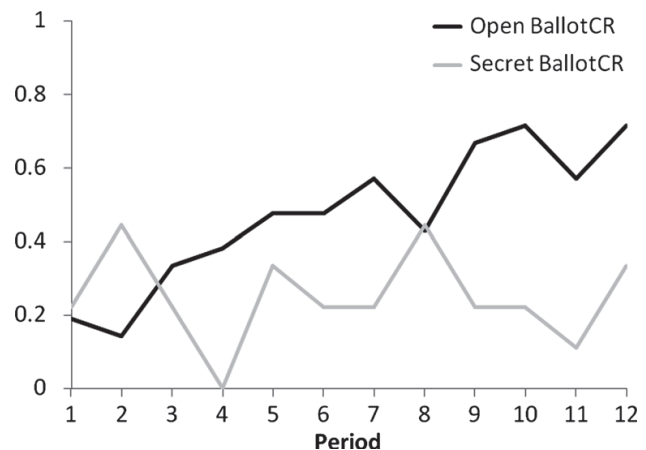
¹⁵Probit regressions with robust standard errors, p -values < 0.06.

Table 6 Transparency and resistance to reform

Probit-marginal effects (robust standard errors)	Dependent variable: probability to vote against comprehensive reform		
	Member preferring first bill	Member preferring second bill	Member preferring third bill
Transparency	0.247*** (0.0639)	-0.00980 (0.0679)	-0.0472 (0.0700)
Pseudo R^2	0.0512	0.000110	0.00987
Prob > χ^2	0.0001	0.89	0.47
Number of observ.	456	456	456
Std. err. adjusted for # clusters	9	9	9

* p -val. < 0.10, ** p -val. < 0.05, *** p -val. < 0.01

Fig. 2 Resistance to reform by members preferring the first bill, over time ($N = 114$)



Finally, we turn to the question of whether the failure of the comprehensive reform causes a general loss in trust and reciprocity among committee members. To do so, we compare the share of members trusting/reciprocating in the treatments with the possibility of voting on a comprehensive reform with treatments in which no comprehensive reform is available. Table 4 illustrates that after the failure of comprehensive reform 25 % of members rewarded others' support in OpenBallotCR and 18 % did so in SecretBallotCR, whereas these shares amount to 31 % in OpenBallotNoCR and 24 % in SecretBallotNoCR. With respect to trust in others' reciprocity we observe 66 % of members voting for at least one preceding bill in OpenBallotCR and 37 % in SecretBallotCR after the comprehensive reform failed, whereas these shares amount to 75 % in OpenBallotNoCR and 41 % in SecretBallotNoCR when no comprehensive reform was available. The regressions in Table 9 provide further insights into how comprehensive reform failure affects trust and reciprocity. It becomes clear that comprehensive reform failure mainly accelerates the decline in the probability of rewarding others over time whereas trust is not statistically significantly affected.¹⁶

¹⁶To control for possible end-game effects, we also ran the regressions in Table 9 including a last period dummy. For *reward* (Open and Secret Ballot) and trust (Secret Ballot), the regression results are robust and the last period dummy is statistically insignificant. For trust in Open Ballot, the last period dummy is negative and statistically significant at the ten percent level.

Table 7 Transparency and resistance to reform over time

Probit (robust standard errors)	Dependent variable: probability to vote against comprehensive reform		
	Member preferring first bill	Member preferring second bill	Member preferring third bill
Constant	-0.800*** (0.132)	-0.698*** (0.117)	-1.234*** (0.418)
Transparency	0.0216 (0.356)	-0.236 (0.159)	-0.123 (0.503)
Period	0.00841 (0.00767)	0.00974 (0.00646)	0.0128 (0.0379)
Transparency × (Period-1)	0.119*** (0.0342)	0.0359 (0.0255)	-0.0277 (0.0432)
Pseudo R^2	0.0991	0.00668	0.0111
Prob > X^2	0.00	0.1089	0.6428
Number of observ.	456	456	456
Std. err. adjusted for # clusters	9	9	9

* p -val. < 0.10, ** p -val. < 0.05, *** p -val. < 0.01

Table 8 Discrimination after comprehensive reform failure (OpenBallotCR)

Probit (robust standard. errors)	Vote for first bill	Vote for second bill	Vote for third bill
Constant	0.55*** (0.170)	-0.83*** (0.184)	-1.60*** (0.105)
Vote for CR	-0.51** (0.237)	0.66*** (0.197)	0.53*** (0.202)
Pseudo R^2	0.02	0.05	0.04
Number of observ.	316	316	316
Robust std. err. adjusted for # clusters	5	5	5

Dep. variables: acceptance of monetarily unfavorable bills (first, second or third bill)

* p -val. < 0.10, ** p -val. < 0.05, *** p -val. < 0.01

5 Conclusion

We showed in a laboratory experiment that the expectation of profitable vote trades can lead to resistance to comprehensive reform. According to standard economic theory, vote trading in our experiment is impossible because commitment devices for vote trading are missing. Consequently, resistance to comprehensive reform should not occur. Nevertheless we observe resistance to the comprehensive reform. Comprehensive reform failure materializes because legislators expect profitable vote trades even with an imperfect device for vote trading, namely a transparent sequential bill-by-bill voting procedure. The transparent voting procedure allows legislators to observe individual votes and, in turn, legislators court positive reciprocity. Because legislators expect others to trust in their reciprocity, they impede efficient comprehensive reforms and trade votes after comprehensive reform failure. Minimum winning coalitions, which trade votes at the expense of third parties, eventually emerge.

Table 9 The impact of failure of comprehensive reform on trust and reciprocity

Probit (robust standard errors)	Dependent variable: reward		Dependent variable: trust	
	Open ballot	Secret ballot	Open ballot	Secret ballot
Constant	-0.274* (0.149)	-0.549*** (0.00386)	0.627*** (0.0293)	-0.196*** (0.0116)
Reform failure	0.00983 (0.187)	-0.116 (0.245)	-0.109 (0.183)	0.171 (0.188)
Period-1	-0.0433*** (0.0105)	-0.0338 (0.0229)	0.00315 (0.0135)	-0.00374 (0.0335)
Reform failure × (Period-1)	-0.0335** (0.0169)	-0.0208 (0.0373)	-0.0199 (0.0290)	-0.0552 (0.0488)
Pseudo R^2	0.0211	0.0125	0.00675	0.00683
Prob > X^2	0.000	0.000	0.3485	0.2372
Number of observ.	532	282	724	626
Std. err. adjusted for # clusters	8	7	8	7

* p -val. < 0.10, ** p -val. < 0.05, *** p -val. < 0.01

Trust in others' reciprocity abates substantially when individual voting behavior is not observable. In turn, vote trading becomes difficult and resistance to comprehensive reform subsides. We do not claim secretive procedures can solve the reform deadlock in real world policy making. Instead, we take our results as a warning that resistance to comprehensive reform can stem from any source that facilitates vote trades or secret agreements.

The importance of trust and reciprocity for resistance to reform might be smaller with asymmetric payoffs, private knowledge about preferences over bills and a larger number of decision makers. However, the importance of trust and reciprocity might also be larger, because, in contrast to real world voting decisions, legislators could communicate directly to agree on a vote trade. Also, the small size of the voting body does not have to be interpreted as a small number of legislators in general. In representative democracies, usually only a small number of political parties exist. If party members toe strictly to their party's line, decisions will eventually be made by a small number of groups. Resistance to reform may then result from parties (instead of individual legislators) strategically vetoing comprehensive reforms.

In light of the points raised above we consider our work a first step in studying the importance of trust and reciprocity in sequential committee decision making. Our contribution is mainly to provide a novel experimental design which can be easily adjusted to explore several aspects of political decision making. For instance our setup makes it possible to study the effects of direct communication of legislators, which may on the one hand strengthen trust and reciprocity and thus increase resistance to reform. On the other hand, communication may reduce resistance to reform since it allows for the expression of emotions (Xiao and Houser 2005). Further, our design may be adapted to investigate the effects of asymmetric payoffs, provide new insights into how trust and reciprocity may affect the power of a committee chairman (Fischbacher and Schudy 2013) or demonstrate how a voting system in which elected representatives have to decide sequentially on a series of bills may affect

trust and reciprocity among decision makers.¹⁷ The latter environment could also allow for cheap talk promises to the electorate and thereby contribute to the discussion on promise keeping and guilt aversion of elected representatives.¹⁸

Our results underline the importance of trust and reciprocity when designing political institutions. We find that changing one institutional factor, namely the transparency of the voting procedure, affects trust and reciprocity among legislators and in turn affects welfare. Typically trust and reciprocity are associated with positive welfare effects, for instance in trust games or public goods games. However, it is not uncommon that trust and reciprocity can lower social welfare. For instance, trust and reciprocity may facilitate collusion in oligopolies or within group cooperation in rent seeking contests between groups (in which within-group cooperation increases the amount of wasted resources).¹⁹ In a similar way, trust and reciprocity foster coordination and, in turn, cooperation against others in our voting experiment. Trust and reciprocity increased total payoffs as long as the possibility for a comprehensive reform was missing. If instead a comprehensive reform were available, trust and reciprocity would lead to resistance to the comprehensive reform and thus to lower total payoffs.

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Appendix A: Proof of Proposition 1

With the following two assumptions, we derive Proposition 1:

- (i) Legislators are reciprocal and do not support bills of legislators who turned down their own bill
- (ii) Legislators do not discriminate against particular counterparts, i.e., they treat agents differently only when they have different information about their behavior

Proposition 1 *The approval of the second bill and the approval of the third bill are not more likely than the approval of the first bill.*

Proof If the first bill is not accepted then both the second and the third beneficiary have turned down the first bill. According to (i) the first beneficiary will not vote for any subsequent bill. Further, because of (ii), the third beneficiary will also vote against the second bill.

¹⁷We thank an anonymous referee for pointing this out.

¹⁸See, for instance, Geng et al. (2011), who investigate how two different types of electoral campaigns (self-descriptions of personality and promises regarding prospective in-office behavior) affect choices by elected representatives. The authors find supporting evidence for the guilt aversion hypothesis (Charness and Dufwenberg 2006). When elections were promise-based elected candidates transferred more money to recipients than candidates selected by a random draw (although promises did not differ). Also, promises and beliefs on voter expectations were positively correlated but correlations between dictators' second-order beliefs and their choices were weaker than predicted. Further, results from Weiss and Wolff (2013) cast doubt on the robustness of the finding that a voting mechanism may create or strengthen an entitlement effect in political-power holders.

¹⁹See, e.g., Leibbrandt and Sääksvuori (2012).

Finally, the third bill also will be turned down because the third beneficiary did not support any preceding bill. Thus, it is not possible that the second or the third bill is approved more frequently than the first bill. \square

Appendix B: Proof of Proposition 2

Assuming (i), (ii) and

(iii) Subjects in the role of the third beneficiary do not vote more frequently for the first bill than subjects in the role of the second beneficiary,

we derive Proposition 2.

Proposition 2 *The approval of the third bill is not more likely than the approval of the second bill.*

Proof We first prove the proposition for voting with partial information. Let us start with the case in which the first bill fails. As we have seen in the proof for Proposition 1, both the second and the third bills will be turned down in this case. We now turn to the case in which the first bill is approved. From (ii), the first beneficiary either votes for both or none of the subsequent bills. If she accepts both bills, both the second and third bills are approved. If she votes against the second and third bills, the second bill can fail only if the third beneficiary votes against it. However, in this case the third bill will also receive no support by the second beneficiary (due to (i)) and likewise will fail.

Let us now turn to the full information case. So far, we have shown that when a bill fails, the subsequent bills fail as well. This is not necessarily true in the full information condition. Here it is possible that the third beneficiary supports only the first beneficiary and receives reward from the first beneficiary whereas the second beneficiary does not support the first bill and receives support neither from the first beneficiary (due to (i)) nor from the third beneficiary because the third beneficiary knows that the second beneficiary turned down the first bill. Hence it is in general possible to observe the committee passing only the first and the third bills. We will now show that it is nevertheless not possible that the third bill is on average approved more frequently than the second due to (iii). Consider two different matching protocols: In matching 1, participant A is the first beneficiary, participant B is the second and participant C is the third beneficiary. Thus participant A received support from participant C and therefore also voted for participant C's bill. In matching 2 instead the participants are matched differently so that participant A is still the first beneficiary, but participant C is now second beneficiary and participant B is now the third beneficiary. This means that participant A received support from participant C, who is now second beneficiary, and participant B, who is now third beneficiary, does not vote for the first bill, and due to (i) and (ii) does not receive any support. Thus with random matching we can conclude that on average the third bill cannot be approved more frequently than the second bill. \square

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