

Markussen, Thomas; Tyran, Jean-Robert

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## Is There a Dividend of Democracy? Experimental Evidence from Cooperation Games

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# Is There a Dividend of Democracy? Experimental Evidence from Cooperation Games

*Thomas Markussen, Jean-Robert Tyran*

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Telephone +49 (0)89 2180-2740, Telefax +49 (0)89 2180-17845, email [office@cesifo.de](mailto:office@cesifo.de)

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# Is There a Dividend of Democracy? Experimental Evidence from Cooperation Games

## Abstract

Do democratically chosen rules lead to more cooperation and, hence, higher efficiency, than imposed rules? To discuss when such a “dividend of democracy” obtains, we review experimental studies in which material incentives remain stacked against cooperation (i.e., free-riding incentives prevail) despite adoption of cooperation-improving policies. While many studies find positive dividends of democracy across a broad range of cooperation settings, we also report on studies that find no dividend. We conclude that the existence of a dividend of democracy cannot be considered a stylized fact. We discuss three channels through which democracy can produce such a dividend: selection, signaling, and motivation. The evidence points to the role of “culture” in conditioning the operation of these channels. Accepting a policy in a vote seems to increase the legitimacy of a cooperation-inducing policy in some cultures but not in others.

JEL-Codes: C900, D700, D900, H400.

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*Thomas Markussen*  
*University of Copenhagen*  
*Faculty of Social Sciences*  
*Department of Economics*  
*Øster Farimagsgade 5*  
*Denmark – 1353 Copenhagen*  
*thomas.markussen@econ.ku.dk*

*Jean-Robert Tyran*  
*University of Vienna*  
*Faculty of Business, Economics and Statistics*  
*Department of Economics*  
*Oskar-Morgenstern-Platz 1*  
*Austria – 1090 Vienna*  
*jean-robot.tyran@univie.ac.at*

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## 1. Introduction

What difference does democracy make for the governance of a country? Broadly speaking, democratic decision-making has two types of effects. First, democracy may lead to the adoption of *different rules and policies* than autocracy, either because different interests are considered or because the information aggregation process is different (Condorcet 1785). Second, the *same rules and policies may work differently*, depending on whether they were chosen democratically or imposed by some authority. This chapter focuses on the second type of effect, presenting evidence collected in experimental cooperation games. We refer to the cooperation-enhancing effect that is generated by adopting a rule or policy through a democratic process rather than being imposed from the outside, as the *dividend of democracy* (Markussen, Putterman and Tyran 2014).<sup>3</sup>

Understanding when and why such a dividend of democracy prevails is highly relevant for the design of political institutions and corporate governance. Dividends of democracy potentially strengthen the case for inclusive institutions, for increased political participation (e.g., by use of referenda) and a stronger emphasis on workplace democracy. On the other hand, democratic decision making may also have negative effects.<sup>4</sup> For example, those who lose out in a contested majority vote may feel oppressed and react with non-compliance or protest.

Experimental methods are ideally suited to study the effects of democracy because they facilitate control of parameters, free rider incentives, and controlled exogenous variation in the availability of democratic institutions. Such variation allows for identifying causal effects of institutions on cooperation. In addition, they allow for comparison of alternative, including counterfactual, policy regimes while non-experimental field studies are often bound to observe historically evolved institutions or happenstance changes in institutions. We focus on the effect of democratic decision making on cooperation by studying a broad range of experimental cooperation games (e.g. public goods games, voluntary contribution-, prisoner's dilemma- and common property resources games). The equilibrium outcomes in such games are typically inefficient in the absence of regulatory interventions. Various surveys review the voluminous literature on what type of interventions increase efficiency (e.g. Chaudhuri 2011, Villeval 2020) while our focus is whether the democratic vs. non-democratic process by which interventions are adopted matters (see Dannenberg and Gallier 2020 for a related review).

It is useful to note upfront that we are not concerned in this paper with the following important potential benefit of democratic decision making. Ever since Thomas Hobbes' (1651), scholars have argued that the free-rider problem can be overcome by a strong state (the "Leviathan"), and that establishing a

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<sup>3</sup> Democratic decision making has been claimed to have a broad range of effects on outcomes, including making people happy (Frey and Stutzer 2000) and increasing growth and reducing corruption. We do not take a position here on the difficult question to what extent these findings are epiphenomena of the two effects concerning rules and policies we mention.

<sup>4</sup> A case in point is that voters may support bad policies because they are uninformed (e.g., Mechtenberg and Tyran 2019) or misinformed and unaware that they are exposed to fake news (e.g., Kartal and Tyran 2022).

strong state is enabled through collective action. For example, Buchanan and Tullock (1962) argue that if everyone is (known to be) rational and self-interested, public goods are underprovided because incentives are stacked against contribution due to the free-rider problem. The problem can be solved by a law that makes contributing an obligation and backs the obligation by a sufficiently severe sanction which deters rational and self-interested agents from free-riding. Rational and self-interested agents would not only comply with such a law, they would also vote for imposing such sanctions because they anticipate that with deterrent sanctions present, everyone will comply with the law. Hence, nobody is punished and an efficient outcome obtains. This account illustrates the efficiency-increasing effects of voting on a cooperation-increasing policy (i.e., to punish free-riders), but does not constitute a “dividend of democracy” in the sense defined here and is not further discussed below.<sup>5</sup>

Instead, we focus on settings in which rational and self-interested agents continue to have incentives to free-ride despite cooperation-inducing policies being in place. For example, sanctions for free-riding may be present but may not be sufficiently strong to deter such agents from free riding. Such institutions are quite common (e.g., low expected fines for tax evasion, see Slemrod 2019) and in these settings, the policy’s effect on efficiency depends on agents’ willingness to cooperate. Such a willingness is supported by social (altruistic, reciprocal) preferences and (optimistic) beliefs about contributions by others, and facilitated by particular structural parameters (e.g., the cost of cooperation).

We discuss three channels through which democracy can produce a “dividend”, i.e., reasons why a given rule results in more cooperation when democratically chosen than when imposed: selection, signaling, and motivation.

To illustrate the operation of these three channels, imagine that a group of people playing a public goods game vote about whether to make contributing to the public good “a law” (an obligation) and to back the law by punishment of those who free ride (i.e. do not comply), but the sanction is too mild to deter rational and self-interested agents from free-riding (e.g., Tyran and Feld 2006). Voting may, first, affect public goods provision through *selection*. People with a propensity to contribute to the public good (i.e., cooperative types) may be more likely to vote for punishing free riders and to comply with mild sanctions than others. Second, voting for punishment may *signal* to others that the voter herself intends to contribute to the public good, which may in turn induce reciprocal voters to cooperate also. Third, the fact that people participate in deciding the rules they live under may in itself increase their *motivation* to choose pro-social actions and to abide by the rule. The intuition that voting may increase the “respect for the law” or legitimacy of rules has been famously forwarded by Alexis de Tocqueville

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<sup>5</sup> Whether this benefit of collective action necessarily constitutes a “dividend of democracy” is debatable because “law and order” is often also imposed by non-democratic governments. However, autocratic rulers may abuse the power required to mete out deterrent sanctions to oppress citizens. The dilemma that a strong state (“Leviathan”) is needed to overcome anarchy, but that the state needs to be held in check and needs to be accountable to its citizens (“to shackle the Leviathan”), is discussed in Acemoglu and Robinson (2019). See Kamei, Putterman and Tyran (2023) for an experimental investigation of that dilemma.

(1835): “It is not always feasible to consult the whole people, either directly or indirectly, in the formation of the law; but it cannot be denied that when such a measure is possible, the authority of the law is very much augmented.” The rest of this article discusses whether a dividend of democracy is present and, if so, whether a dividend is driven by de Tocqueville’s intuition or by other (e.g., selection and signaling) effects.

## **2. Experimental evidence on a dividend of democracy is mixed**

A number of experimental papers document *positive effects of democracy*. Frohlich and Oppenheimer (1990) experimentally study a setting in which earnings from a real-effort task are shared between participants. Results show that effort is higher in groups where people participated (through deliberation and voting) in choosing principles of redistribution than in groups where such principles were imposed by the experimenter. Alm, Jackson and McKee (1993) present evidence from a taxation experiment. Participants choose how much tax to pay. In some treatments, they vote on how the proceeds from taxation are used while in others this decision is imposed. Results show that tax revenue is higher in treatments with voting. Tyran and Feld (2006) study public goods games and introduce “mild” (theoretically non-deterrent) sanctions against free riders. Results show that mild sanctions have a much stronger, positive effect on public goods contributions when adopted by voting than when imposed. Dal Bo, Foster and Putterman (2010) focus on a prisoner’s dilemma game which may be transformed into a coordination game. In some treatments, the payoff matrix (prisoners’ dilemma or coordination game) is imposed, in others it is adopted by voting. Results show that changing the payoff matrix by voting has a stronger positive effect on cooperation than when the change is externally imposed. Sutter, Haigner and Kocher (2010) introduce peer-to-peer punishment and reward in a public goods game and show that these institutions increase contributions to the public good more when they are chosen by voting than when they are imposed.

Other papers reporting positive dividends of democracy include Alm et al. (1999), Ambrus and Greiner (2019), Baldassarri and Grossmann (2011), Corazzini et al. (2014), DeCaro, Janssen and Lee (2015), Drazen and Ozbay (2019), Engel and Rockenbach (2014), Grimm and Mengel (2011), Grossman and Baldassarri (2012), Jensen and Markussen (2021), Kamei, Putterman and Tyran (2015), Kamei (2016), Kroll, Cherry and Shogren (2007), Mansour et al. (2021), Marcin, Robalo and Tausch (2019), Markussen, Putterman and Tyran (2014), Mellizo, Carpenter and Matthews (2014), Sausgruber, Sonntag and Tyran (2021), and Schories (2022). Most of these papers report results from lab experiments. The external validity of these findings is supported by the fact that effects of democracy have also been established in field- and lab-in-the field experiments (e.g. Olken 2010, Baldassari and Grossmann 2011).

Most lab experiments that use dynamic settings with repeated voting report a stable or even increasing dividend of democracy over time. Examples are Frohlich and Oppenheimer (1990), Alm, Jackson and McKee (1993) and Dal Bo, Foster and Putterman (2010).

#### *Absent and negative effects of democracy*

While positive dividends of democracy have been documented across a broad range of cooperation experiments as shown above, it would not be accurate to speak of the dividend of democracy as a “stylized fact” in cooperation experiments. In fact, there is a considerable number of papers reporting mixed or statistically insignificant effects of democracy. These include Andreoni and Gee (2012), Beath, Christia, and Enikolopov (2017), Bischoff (2007), Dannenberg, Haita-Falah and Zitzelsberger (2020), Kocher et al. (2016), Markussen, Reuben and Tyran (2014), Martinsson and Persson (2019), Messer, Sutter and Yan (2013), Mollerstrom and Sunstein (2020), Rauchdobler, Sausgruber and Tyran (2010), and Wahl, Muehlbacher and Kirchler (2010).

Perhaps surprisingly, there are also papers documenting *negative* dividends of democracy, at least for particular groups of participants. For example, Gallier (2020) presents results from a public goods experiment with non-deterrent sanctions against free riders which show a positive effect of democracy on those who voted in favor of sanctions, but also an equally strong, negative effect on those who voted against them and were overruled by the majority. On aggregate, Gallier (2020) finds no significant dividend of democracy. DeAngelo, Dubois and Romaniuc (2020), Kosfeld, Okada and Riedl (2009), Sutter and Weck-Hannemann (2003), and DeAngelo and Gee (2020) also provide studies with null results or even negative dividends, especially for overruled minorities.

#### *Representative democracy*

Most of the papers discussed above investigate some form of “direct democracy” in that they study voting on the adoption of a rule or policy. However, voting often serves to elect representatives who later choose rules or policies. In “representative democracy”, a dividend of democracy may be said to prevail if democratically elected leaders choose more pro-social rules (i.e., rules that benefit society rather than the leader) than non-elected leaders.

Baldassarri and Grossmann (2011) and Grossman and Baldassarri (2012) find support for such a dividend in a lab-in-the-field public goods experiment in Uganda. Group leaders (“monitors”) have the authority to sanction free riders. Results show that leaders chosen by vote induce higher cooperation than randomly appointed leaders. Marcin, Robalo and Tausch (2019) consider a public goods game with “enforcers” (i.e., third parties with the power to monitor and sanction free riders). They find that efficiency is higher with elected enforcers. Corazzini et al. (2014) study leaders who are in charge of distributing a budget between themselves and other group members. They find that elected leaders are more generous than appointed ones, especially when elections were preceded by election campaigns



where leaders made non-binding promises about how to distribute resources. Drazen and Ozbay (2019), Hamman, Weber, and Woon (2011), Jack and Recalde (2015), Mansour et al. (2021) and Schories (2022) also report positive effects of representative democracy.

However, the evidence for a dividend of democracy in representative settings is not unequivocal. For example, Markussen and Tyran (2017) find that elected leaders who are in charge of choosing the entire public goods contribution vector in a group behave no more benevolently than exogenously appointed ones. The authors study a set-up which allowed selfish candidates to imitate benevolent ones at the pre-election stage, meaning that voters were unable to distinguish cooperative vs. non-cooperative candidates, and the political selection process was therefore ineffective in terms of voting benevolent types into office.

### **3. Three channels**

Democratic decision making may induce a dividend through three channels: selection, signaling, and motivation.

#### *Selection*

To illustrate selection effects, suppose people with a propensity to cooperate are also more likely to vote for punishing free-riders. Suppose group composition is random such that the share of cooperative people varies across groups. Groups that happen to consist of many cooperative voters are more likely to adopt the sanction. The researcher observes in this case that groups that voted for the sanction cooperate more. But this observation is not driven by a causal effect of voting on cooperation, but by selection.

Dal Bo, Foster and Putterman (2010) show how selection effects can be controlled by implementing the so-called “vote override procedure”: All participants vote, but in some treatments the voting choice is overridden by the experimenter and institutions are exogenously imposed. The procedure enables the researcher to know the preference of all participants by observing their votes and, thus, to control for selection (see also Dal Bo, Foster and Kamei 2019). While selection is discussed as a challenge to identification of causal effects in various studies, some papers treat selection effects as a phenomenon of substantive interest. Bohnet and Kübler (2005) investigate sorting between prisoner’s dilemma games with different payoff matrices and find that selection effects indeed imply that earnings are higher when people sort into games with lower costs of unilateral cooperation than when this payoff function is imposed on groups. Kamei and Markussen (2023) find that allowing subjects to choose which type

of real effort tasks to work on leads to higher productivity, and to less free riding in groups with revenue sharing.<sup>6</sup>

### *Signaling*

Voting may serve as a device to signal one's intention or preference to cooperate to other group members which may generate a dividend of democracy in the presence of reciprocally motivated voters. Jensen and Markussen (2021) show in a model in which some people are selfish while others have varying degrees of reciprocal preferences that the most pro-social types use voting on payoffs in a prisoner's dilemma game to credibly signal their presence to other participants in the game. This, in turn, elicits cooperation from reciprocal group members who would not have cooperated in the absence of the signal. Hence, a dividend of democracy emerges. The authors confirm these theoretical predictions in a laboratory experiment. Tyran and Feld (2006) also name signaling as a likely explanation for the dividend of democracy they observe.

### *Motivation*

A dividend of democracy may also emerge in cooperation games because the democratic process strengthens people's motivation for behaving pro-socially. Participatory processes potentially strengthen feelings of autonomy and self-determination and thereby increase the legitimacy of democratically chosen rules. Legitimacy may in turn increase rule compliance and generate a dividend of democracy, cf. the quote from de Tocqueville 1835 in the introduction. The literature on procedural fairness (e.g. Tyler 2006) has argued that processes deemed as fair meet with higher acceptance, and a decision in which an individual had a say may be seen as more fair than one resulting from non-participatory processes. Collective decision making may also strengthen *identification* with other group members and therefore reinforce cooperative preferences. See Bartling, Fehr and Herz (2014) for a study on the intrinsic value of decision rights.

Mechtenberg and Tyran (2019) study a common-interest situation in which voters all share the goal of wanting to choose the best among available policies but are uncertain about which policy is best. Voters can acquire information about the effectiveness of alternative policies at a private cost, which due to information aggregation improves the quality of the collective choice (i.e. the chance of picking the best policy). According to standard theory, strictly self-interested voters do not make sufficient efforts to collect information but choose to remain "rationally ignorant" (Downs 1957) and, thus, do not contribute to the public good. However, the authors find that voters are more motivated to collect information when subjects demand to make choices by voting than when voting is imposed on subjects.

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<sup>6</sup> Due to space constraints, we do not survey studies with "voting with the feet" in which people can move between polities offering alternative environments in terms of rules and policies. Such studies tend to produce positive dividends of endogenous choice (see Cobo-Reyes et al. 2019, 2022 for studies combining regular voting and "voting with the feet").

Dal Bo, Foster and Putterman (2010) conclude that effect of democracy in their experiment (see above) is mostly explained by motivational factors.

#### **4. Conditions conducive to a dividend of democracy**

Communication (or, deliberation) often accompanies voting. Communication promotes the signaling mechanism because it enables voters to signal their type to others. Messer et al. (2007) implement an experiment where participants either play a lottery or a public goods game. The game to be played is imposed by the experimenter in some treatments and chosen by vote in others. Results show that voting leads to higher public goods contributions, but only when it is accompanied by an opportunity to engage in “cheap talk”, i.e., to make non-binding promises (see also Corazzini et al. 2014). If participants suffer a psychological cost of lying, cheap talk may be a credible means of signaling intended contributions to a public good.

Jensen and Markussen (2021) study a setting where groups vote about the payoff parameters in a prisoner’s dilemma game. Randomly matched pairs of participants play the games with the payoffs chosen by the group. Theoretical as well as experimental results show dividends of democracy in groups of all sizes but also that the dividend of democracy is much stronger in small groups (of two or four members) than in large groups (10 members). The explanation is that the signaling value of voting is stronger in a small than in a large group.

The motivation channel may have stronger effects in a political culture emphasizing equal rights and participation than in places with hierarchical and authoritarian values. Vollan et al. (2017) replicate Tyran and Feld (2006) in China. While Tyran and Feld (2006) found a significant dividend of democracy in Switzerland, Vollan et al. (2017) find that cooperation is higher when rules are imposed than when they are chosen by vote in China. This finding is consistent with the view that norms and values (i.e., culture) shape the effects of the motivational channel through which the dividend of democracy obtains. This is not to say that dividends of democracy exclusively exist in WEIRD (Western, Educated, Industrialized, Rich and Democratic, cf. Henrich 2020) societies. Similar to Vollan et al. (2017), Baldwin and Mvukiyehe (2015) find no dividend of democracy in an observational field study in Liberia. However, Baldassarri and Grossmann (2011) do find a positive effect of democracy in a lab-in-the-field experiment in Uganda (discussed above). Olken (2010) finds that projects chosen through direct democracy (“plebiscites”) in villages in Indonesia elicit higher satisfaction from users than projects chosen by local elites, and Mansour et al. (2021) show in a laboratory experiment that electorally accountable leaders perform better than other leaders in Egypt. Elinor Ostrom argued that self-organization and participatory decision making can lead to responsible and sustainable management of common pool resources (Ostrom 1990), a claim that has received support in various studies across a broad range of commons and countries. In sum, culture is likely to be an important

conditioning factor behind the dividend of democracy but our understanding of *which* cultural elements are important remains limited.

## 5. Summary and conclusion

We have argued that a “dividend of democracy” has been demonstrated in a large number of experiments across a broad range of cooperation games but is not a stylized fact in all cooperation games. Understanding when and why dividends of democracy emerge remains an important research agenda. The literature points to three channels through which democracy can induce a dividend: selection, signaling, motivation. The evidence suggests that communication possibilities, small group size and political culture emphasizing equal rights and participation are likely to be conducive to the operation of these channels. A crucial aspect of the “motivation” channel is the perceived legitimacy of a democratic choice. Factors fostering the legitimacy may be “cultural” which may include having experienced a well-functioning liberal democracy with an effective government over extended periods. However, legitimacy of democratic choices may be seen as weak and the resulting choices as unfair when large minorities are regularly voted down by majorities (“tyranny of the majority”).

An important methodological point emerging from the literature presented here is that the mode of implementing rules and policies matters for how well they work. This finding has implications, for example, for the interpretation of results from randomized controlled trials (RCTs) which, by design, exogenously impose institutions. Care is therefore advised when trying to extrapolate findings from RCTs to settings where people are able to choose the institutions that govern their interactions.

An important challenge for future research is to investigate how the dividend of democracy depends on electorate size. While some evidence is available showing that cooperation does not decrease with group size (e.g. Weimann et al. 2019 for public goods games with 100 subjects and Bayer, Faravelli and Pimienta 2023 for information acquisition in common-interest voting games with 200 subjects), little is known about whether the dividend that has been demonstrated to prevail in many small-scale settings will also prevail in large electorates.<sup>7</sup>

In closing, we note that the “dividend of democracy” as discussed here is one of the (many) reasons to prefer democracy over authoritarianism, even if the two systems were to adopt the same rules.

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<sup>7</sup> Jensen and Markussen (2021), discussed above, consider effects of electorate size but do not study groups larger than 10 members.

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