# Implementing Direct Democracy Via Representation

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June 14, 2021

## Abstract

Nowadays, several social movements asking for direct participation of citizens in the decision-making process are emerging in western democracies. These groups argue that traditional representative systems fail to adequately represent the will of the majority (often defined as "people" by populist movements) and support direct democracy as the only political system to restore the will of the majority. In this paper we consider a setting where several decisions about independent issues have to be made, and analyze under what conditions the two systems coincide; that is, the policy implemented by the winner of an electoral competition coincides with the one that citizens would choose by means of direct democracy. We find necessary and sufficient conditions for this equivalence to hold, implying that, as long as at least one of them is not fulfilled, the equivalence between direct democracy and representative democracy ceases to exist and disaffection in representative democracy would arise. The theoretical predictions of the model state, that the more divided the electorate over the proposals to be carried out for the bundle of issues and the less polarized are the politicians, the more likely it is that the conditions fail to be satisfied. We illustrate how the failure of our conditions leads to reasons for the emergence of mistrust in systems of representative democracy. Deeply divided societies, the activity of lobbies and special-interest groups, and the failure of electoral competition stand as responsible.

Keywords: Direct democracy, Representative democracy, Majority rule, Bipartisan, Elections, Information.

*Journal of Economic Literature* Classification Numbers: D71, D72, D82.

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# 1.   Introduction

A significant phenomenon in current society is the emergence of social movements with an anti-representative democracy rhetoric. These groups criticize systems based on power delegation largely thanks to the risk of politicians being self-seeking and behaving against people's interest. They claim the need for direct participation of citizens in the decision-making process to guarantee the representativeness of society's preferences in the final outcome. As a result of the recent success of this discourse among the population, the emergence of political parties in favor of direct democracy has become a generalized fact in Europe, having arisen in several countries. *Freedom and Direct Democracy* in the Czech Republic, *Alternative for Germany* in Germany, the *Five Star Movement* in Italy, *Podemos* in Spain, *Direktdemokraterna* in Sweden, and *Something New* in the United Kingdom are just some examples of parties demanding the right of people to decide directly by using instruments of direct democracy, such as referendums and popular consultations. These organizations defend the idea that citizens should be able to decide on each and every one of the issues that comes up for discussion. When decisions about several issues have to be made, these political parties demand that, for each of these issues, what the majority of people desires should be carried out.

The claims of these movements about the need to shift towards a system of direct democracy in order to achieve such an outcome could be interpreted as an omen about the inability of representative democracy to implement what the majority of people desires for each specific issue. We develop a positive analysis of this matter. The purpose of this paper is to study under what conditions a representative democracy system implements a policy, a vector of decisions on every issue, such that it coincides with the majority preferences on each issue.

Having representative democracy match direct democracy would allow the social demands of these groups to be satisfied without suffering the serious problems entailed by direct democracies. The digital age has made the cost of participation for voters to be practically negligible; voters can now simply vote from any device with an internet connection. However, high economic costs would still need to be incurred when organizing each of the referendums. Campaign costs to inform voters about the subject to be voted on, or the costs of designing the digital platform through which voting would take place, are just two examples. Another significant

concern is the low turnout.[1] In a world in which a referendum is held over each single issue, the small costs of participation for voters may not be a guarantee of a high participation rate. The reason is that having to face referendums on a constant basis could lead to voter exhaustion (see Leininger, 2015, for a reference on how referendums might not really improve representation).

Formally, we investigate whether there are necessary and sufficient conditions such that decisions made on each issue in a representative democracy coincide with the decisions that would have been chosen in a direct democracy by majority voting issue-by-issue. We propose a model in which there are a finite number of issues on which a binary decision has to be made. We assume that there are no complementarities among issues, so the order in which decisions on different issues are made has no effect on the choice made for each issue. If the decisions among issues are linked, the comparison between the two systems would depend on the order according to which they are chosen, and in this paper we do not model what determines the order of the popular votes in a direct democracy system.

In direct democracy, voters vote directly for their more preferred decision on each issue, so majority voting issue-by-issue is the outcome in these systems. In representative democracy, we introduce a two-party system competition where the political platforms of these parties are known. It is common knowledge that candidates representing each of the two parties will have these political platforms as the most preferred set of decisions for the bundle of issues. Candidates care about both the implemented policy and being in office. However, whether the policy to be carried out or the fact of being in office is more important for a candidate remains private information. Our model thus allows for candidates' preferences ranging from policy-motivated to office-motivated. Note that, by using this broad definition of preferences, the main criticism that systems of political representation receive from groups in favor of direct democracy -the risk of having politicians whose motivations are unknown and might only be pursuing their own interests- is taken into account in our analysis. The conclusions from our study would therefore also apply in a framework in which those criticisms are indeed a fact. Candidates' preferences are explained in more detail later on in the paper.

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[1]Butler and Ranney (1994) looked at turnout in national referendums held during the period 1945-1993 in 12 established democracies and found that it was in mean around 30 percentage points lower than participation in general elections.

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We find conditions guaranteeing that the equilibrium outcome of the electoral game induced by a representative democracy is unique and coincides with the policy yielded by majority voting issue-by-issue irrespective of candidates' preferences, that is, regardless of whether they are more office-oriented or more policy-oriented. These necessary and sufficient conditions impose restrictions over both the preference profile of voters and the political platforms of candidates. The first one requires that there be no policy such that is preferred by a majority of voters to the policy yielded by majority voting issue-by-issue.[2] The second condition is a double condition that suffices with being fulfilled in only one of its two forms.[3] It requires that, either there be at least one candidate whose most preferred policy coincides with the outcome of majority voting issue-by-issue, or candidates' preferences are such that there is no issue for which both candidates have the same most preferred decision. As will be explained further, first and second conditions above taken together guarantee existence and uniqueness of an electoral game equilibrium according to which both candidates propose the outcome of majority voting issue-by-issue.

Knowing when the outcomes derived from both systems coincide will ultimately provide insight on the reasons for the emergence of discontent among the population with representative democracies. The non-fulfilment of the conditions guaranteeing the equivalence between direct and representative democracy can be interpreted as a threat to the stability of representative democracies. Failure to obtain the majority preferred result for each issue through the representative democracy system is the perfect argument for those groups in favor of direct democracy to raise their voices against the representative system. An analysis in this regard will also be offered in this paper.

**Related Literature**

Several papers show the risk posed by representative democracy of failing to represent the preferences of the majority, and explain how direct democracy would contribute to solving this problem. Two of these works are essential if we are to understand the contribution

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[2]Equivalently, the outcome of majority voting issue-by-issue has to be a Condorcet winner relative to the voters' preference profile on the set of policies.

[3]Still, both conditions are compatible and may hold at the same time.

to the literature of this paper. According to Besley and Coate (2008), policy outcomes on specific issues may differ substantially from what the majority desires when citizens have only one vote to cast for candidates who have to decide on a bundle of issues. They show that citizens' initiatives and referendums prevent such problems from occurring. Matsusaka (1995) provides empirical evidence that allowing citizens to participate in lawmaking leads to the prevalence of the median voter's preferences along different dimensions and therefore reduces the discretionary performance of the government. In this paper, we identify societies in which the outcome generated by representative democracy is free from the dilemmas posed by Besley and Coate (2008) and Matsusaka (1995), thus it is not necessary to resort to the direct participation of citizens. Specifically, we find conditions under which representative democracy gives the same result as unbundling the issues and provides the outcome a majority of the voters desire.

As far as we know, Coffman (2016) is the only paper in the literature that develops a theoretical analysis investigating the conditions under which representative democracy implements the choices made by people in direct democracy. The author considers the existence of a single issue for which there are a finite number of alternatives. She focuses on the case where the decision made in direct democracy leads to a strict ordering of these alternatives and looks for conditions under which the candidate with this ordering is elected. Contrary to this, we consider that there are a finite number of issues for each of which a binary choice has to be made. We aim to find conditions under which decisions for each issue that people would have made, one at a time, in independent referendums are implemented by the elected candidate when she decides for the bundle of issues, regardless of what that candidate's preferences are. To this extent, our paper addresses the question of the equivalence between direct and representative democracy under a framework that better captures the true essence of representative democracies, where one person or a small group of people decides not only on a single issue but on several ones on behalf of the rest of the citizens.

Within the scope of the comparison between direct and representative democracy we also find the work by Kessler (2005). The author proposes a model to study the advantages of each of these regimes. Among her findings, she highlights the greater alignment of policies with the preferences of the median voter when policies were chosen through direct democracy. As long as this theoretical conclusion is in line with the empirical findings in Matsusaka (1995),

our work helps to identify circumstances under which direct democracy no longer represents an advantage over representative democracy in this regard.

A matter that has also aroused interest among the authors has been the suitability of each of these systems. Maskin and Tirole (2004) study whether decisions should be made by the public directly, politicians subject to re-election, or independent judges in order to maximize the social welfare. Correa-Lopera (2019) investigates whether direct or representative democracy will be preferred by a society as a form of government. The author considers a framework in which voters have an informational disadvantage about the economically efficient policy, but both voters and politicians can be driven by either individual or social interests. In this way, the present work can be understood as a complement to these studies, insofar as it offers a framework under which the debate on the appropriateness of one or the other system would have no place since both would be equivalent.

Another strand in the literature examines how the presence of the institutions of direct democracy may affect the behavior of politicians in representative democracies. A consensus on the predominance of positive or negative effects has not been reached among the different authors. Le Bihan (2018) finds that the accessibility to citizen-initiated referenda induces a greater alignment between the appointed policies and voters' preferences on both issues that can be subjected to referendum and issues that cannot. In a framework in which elected officials have a preference for both policies and being in office, allowing voters to call for a referendum reduces the political benefits of going against the public interest, since the elected official could find her policy decision annulled and her re-election chances compromised. While Le Bihan (2018) claims for the preponderance of benefits that instruments of direct democracy bring to representative democracies, Prato and Strulovici (2017) find that negative effects could outweigh the initial welfare derived from the alignment between policies and voters' preferences. Since elected officials know that voters can amend a wrong decision, they feel exempt from any responsibility thus reducing the effort they exert, which entails the risk of elected officials taking wrong decisions on those matters for which a referendum cannot be called. The beauty of the findings in our paper is that, under specific conditions, representative democracy would achieve full alignment between policies and voters' preferences, without the need to have instruments of direct democracy altering the behavior of elected politicians.

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Conditions guaranteeing the outcome equivalence between direct and representative democracy allow our paper to relate to two additional branches of the literature. Several papers expose the benefits of polarization of political candidates. Bernhardt et al. (2009) propose a model with purely office-motivated parties and show that divergence in the parties proposed policies improves voters' welfare. Fauli-Oller et al. (2003) introduce a model with purely ideology-motivated parties and conclude that, in order to maximize the party chances of winning the election, parties have incentives to nominate candidates with a more radical ideology, which leads to a greater polarization of the policies proposed by parties. Dodlova and Zudenkova (2016) provide both theoretical and empirical evidence that the better an incumbent's performance the more it leads to higher political polarization. To the extent that the polarization of candidates' preferences is found to be one of the conditions that contributes to the equivalence between direct and representative democracy systems, our paper enlarges the range of benefits recognized by a politicians' polarization. The other branch of the literature to which our paper would be contributing relates to the advantages of voters' preferences convergence. Casella (2005) proposes a model in which members of a committee that periodically meets to make decisions are allowed to store their votes to use them in some future voting. The author finds that in such a context welfare improvements happen if the preferences of those members are not too polarized. Our requirement of having the outcome of majority voting issue-by-issue as a Condorcet winner relative to the voters' preference profile can be understood as the need for a certain degree of homogeneity among voters' preferences. In this regard, our paper incorporates the alignment of outcomes between direct and representative democracy to the set of benefits from voters' preferences convergence.

The remainder of the paper is organized as follows. Section 2 introduces the model. Section 3 presents the results along with their corresponding proofs, as well as an interpretation of them. Section 4 offers a discussion about the emergence of sentiments against representative democracy when our conditions are not met. Finally, Section 5 concludes. Appendix A offers some explanatory notes.

## 2. The Model

There are $q$ issues and for each of them a binary decision has to be made. Let $K = \{1, ..., q\}$ be the set of issues and $k \in K$ an arbitrary issue. Let $x = (x^1, ..., x^q)$ be a vector of decisions on $q$ issues where $x^k \in \{-1, 1\}$ denotes the decision for issue $k$. We call a vector $x$ a policy and $A \equiv \{-1, 1\}^q$ the set of policies.

Let $N = \{1, ..., n\}$ be an odd finite set of voters. Each voter $i \in N$ has strict separable preferences defined over the set of policies, which means that for each issue $k$ her most preferred decision remains invariant regardless of the decisions for all the other issues.[4] For voter $i \in N$, let $\mathcal{P}_i$ be the set of all strict separable preference relations defined on $A$, with typical element $P_i$. Let $P_N = (P_1, ..., P_n)$ be a voters' preference profile, which in our model is common knowledge.[5] Given a preference profile of voters, let $x^k_{maj}(P_N) \in \{-1, 1\}$ be the decision preferred by a majority of voters for issue $k$ and $x_{maj}(P_N) = (x^1_{maj}(P_N), ..., x^q_{maj}(P_N)) \in A$ the policy for which the decision on each issue $k$ is made by majority voting. We say that a policy is a Condorcet winner relative to the voters' preference profile when no other policy defeats it in pairwise comparisons. Formally:

**Definition 1.** *A **policy** $y \in A$ is a **Condorcet winner at $P_N$** if there is no $z \in A$ such that $\# \{i \in N \, / \, z \, P_i \, y\} > \frac{n}{2}$.*

Let $L$ and $R$ be two candidates, each representing a different political party. We denote the set of candidates by $C = \{L, R\}$. We introduce the electoral game played by these candidates. Each candidate announces a policy, which is the one that she implements in case of winning the election. Let $m_L$ and $m_R$ be the announced policies by candidates $L$ and $R$ respectively where $m_L, m_R \in A$. Once policies have been announced, each voter votes sincerely for the candidate who announces a more preferred policy.[6] When candidates announce different policies, having an odd number of voters with strict preferences over policies implies that one of the two

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[4]This implies that for each issue $k$ a voter $i$ has either $-1$ or $1$ as her most preferred decision. See Breton and Sen (1999) for a deep understanding on how every strict separable preference relation over the set of policies induces a unique strict preference relation over each issue.

[5]Note that the frequent surveys and opinion polls conducted among the population allow us to have an accurate knowledge of the preferences of a society.

[6]Note that, with binary choices, sincere voting is the equilibrium.

candidates necessarily wins the election. However, when the announced policies are the same, both candidates would be equally likely to win the election. We refer to this situation as a "tie" between candidates.[7] We use $w_L$ or $w_R$ to denote that candidate $L$ or candidate $R$ wins the election and *tie* for the coinciding announcements case. Let $O = \{w_L, tie, w_R\}$ be the set of office-outcomes. Candidates have preferences over the set of policies and also for being in office. We define an electoral-outcome as a pair of office-outcome and policy. Let $\mathcal{E} \equiv O \times A$ be the set of electoral-outcomes, with typical element $(o; x)$ where $o \in O$ and $x \in A$. Candidates have separable preferences defined over the set $\mathcal{E}$. Preference for being in office implies that, given the subset of electoral-outcomes for which the policy $x$ is the same, each candidate prefers the electoral-outcome in which she wins to the one in which she ties, and the latter to the electoral-outcome in which she loses.[8] Formally, an admissible preference relation for candidate $c \in C$ is such that given $x \in A$, we have that $(w_c; x) \, P_c \, (tie; x)$ and $(tie; x) \, P_c \, (w_{-c}; x)$. Let $\mathcal{P}_c$ be the set of all these preference relations for candidate $c \in C$ defined on $\mathcal{E}$, with typical element $P_c$. Let $P_C = (P_L, P_R)$ be a candidates' preference profile. Note that no restriction is imposed on how candidates rank any pair of electoral-outcomes containing different policies. This preference domain allows for the existence of candidates who differ in the importance they attach to both the policy to be implemented and the fact of being in office. Thus, our framework includes candidates whose preferences range from a sort of "fully-office motivation", where being in office is prioritized over policies, to a kind of "fully-policy motivation", where policies are prioritized over being in office, through preferences according to which the candidate could be either more office-oriented or more policy-oriented. Formally, we say that candidate $c \in C$ is "fully-office motivated" if for each $x, y \in A$, $(w_c; x) \, P_c \, (tie; y)$, while we say that she is "fully-policy motivated" if for each $x, y \in A$ with $(w_c; x) \, P_c \, (w_c; y)$, we have that $(w_{-c}; x) \, P_c \, (w_c; y)$. Note that the depicted preference relations are just two of all the preference relations belonging to $\mathcal{P}_c$. For convenience, we refer to the most preferred policy on $A$ of each candidate as her "top". Given a preference profile of candidates, let $\tau_L$ and $\tau_R$ be the tops of candidates $L$ and $R$ respectively where $\tau_L, \tau_R \in A$. For each candidate $c \in C$, let $\tau_c = (\tau_c^1, ..., \tau_c^q)$ where $\tau_c^k \in \{-1, 1\}$ is the decision preferred by candidate $c$ for issue $k \in K$. Note that, for any candidate, there will be different preference relations that share the same top. As a result, different preference profiles of candidates can generate the same pair of tops $(\tau_L, \tau_R)$.[9]

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[7]For each voter, the decision on which candidate to vote for is comparable to a coin-flipping game.

[8]The term *to lose* refers to the case in which the opponent candidate wins.

[9]See Appendix A for an illustration of the set of admissible preference relations for a candidate, and how preference

**Definition 2.** *Given a pair of tops $(\tau_L, \tau_R)$, we say that a preference profile of candidates $P_C$ is consistent with $(\boldsymbol{\tau_L}, \boldsymbol{\tau_R})$ if $\tau_L(P_L) = \tau_L$ and $\tau_R(P_R) = \tau_R$.*

We highlight the situation in which, issue by issue, the most preferred decision of one of the candidates is the opposite to the most preferred decision of the other candidate. We refer to this condition as maximal top-differentiation between candidates.

**Definition 3.** *We say that candidates are **maximally top-differentiated** when, for each issue, the most preferred decision of candidate L is the opposite to the most preferred decision of candidate R. Formally, $\tau_L = -\tau_R$.*

Regarding preferences of candidates, we consider a framework in which only their respective tops are known. This is how we allow for candidates in our model to have any kind of motivation, *i.e.*, being either more office- or more policy-oriented, and that the extent to which they put one aspect before the other is private information. As already stated in the Introduction, this assumption is motivated by the recent concerns about representative democracies that have been expressed by a part of society. The intent is that the results derived from the present analysis are applicable in a world in which the risk of having politicians whose motivations are unknown and might be pursuing interests contrary to those of the population could be a fact. Thus, a society in our context is defined by a preference profile of voters and a pair of tops of candidates. Let the triplet $(P_N, \tau_L, \tau_R)$ define a society. Our aim is to study when, in a representative democracy where candidates play the electoral game, the decision made for each issue coincides with the decisions that would have been chosen in a direct democracy where voters directly vote over each single issue. We focus on the Nash Equilibrium concept of the electoral game.

**Definition 4.** *Given a society $(P_N, \tau_L, \tau_R)$ and a preference profile of candidates $P_C$ consistent with $(\tau_L, \tau_R)$, we say that announcements $\boldsymbol{m_L}$ and $\boldsymbol{m_R}$ constitute a **Nash Equilibrium of the electoral game** if no candidate $c \in C$ has incentives to deviate and announce some $m_c' \in A \setminus \{m_c\}$.*

relations representing candidates with different kind of motivation result in the same top.

# 3.   On When Representative Democracy Equals Direct Democracy: The Results

For every possible society, our purpose is to find under what conditions $x_{maj}(P_N)$ is the unique Nash Equilibrium outcome of the electoral game for each preference profile of candidates which is consistent with $(\tau_L, \tau_R)$.

Lemma 1 states that, if there is a Nash Equilibrium of the electoral game, then both candidates are announcing the same policy. Intuitively, it is easy to see why a situation in which different policies are announced cannot be sustained as equilibrium. If this were the case, we know that the candidate announcing a more preferred policy by a majority of voters wins the election and carries out her announced policy. By preference for being in office, the losing candidate has incentives to deviate and announce the same policy as the winning candidate since, given the implementation of such policy, this candidate prefers to tie rather than to lose.

**Lemma 1.** *If announcements $m_L$ and $m_R$ constitute a Nash Equilibrium of the electoral game, then both candidates announce the same policy.*

**Proof.** Suppose not, *i.e.*, let $m_L = y$ and $m_R = z$ where $y \neq z$ and $y, z \in A$ such that $m_L$ and $m_R$ are a Nash Equilibrium of the electoral game. Suppose, without loss of generality, that $(w_L; y)$ is the obtained electoral-outcome after voting by voters. Consider candidate $R$. Let $m'_R \in A$ such that $m'_R = y$. Note that, if candidate $R$ deviates and announces $m'_R = y$, then $(tie; y)$ is the resulting electoral-outcome. By preference for being in office, $(tie; y) \, P_R \, (w_L; y)$, so announcing $m'_R = y$ is a profitable deviation for candidate $R$ when $m_L = y$. Therefore, $m_L$ and $m_R$ are not a Nash Equilibrium of the electoral game. ∎

We now identify a necessary condition for having $x_{maj}(P_N)$ as the unique Nash Equilibrium outcome of the electoral game. Proposition 1 states that only if $x_{maj}(P_N)$ is a Condorcet

winner, is there room for the achievement of such purpose.

**Proposition 1.** *Given any society* $(P_N, \tau_L, \tau_R)$, *suppose that* $x_{maj}(P_N)$ *is the unique Nash Equilibrium outcome of the electoral game for every* $P_C$ *consistent with* $(\tau_L, \tau_R)$. *Then* $x_{maj}(P_N)$ *is a Condorcet winner at* $P_N$.

**Proof.** By way of contradiction, suppose that for some society $x_{maj}(P_N)$ is not a Condorcet winner at $P_N$. Then, there exists $y \in A$ such that $\# \{i \in N \ / \ y \ P_i \ x_{maj}(P_N)\} > \frac{n}{2}$. Let $P_C = (P_L, P_R)$ be a candidates' preference profile consistent with $(\tau_L, \tau_R)$ such that, for at least one of the candidates, say $L$, $P_L \in \mathcal{P}_L$ and, for each $h, s \in A$, we have $(w_L; h) \ P_L \ (tie; s)$. By Lemma 1, we know that, $m_L = m_R = x_{maj}(P_N)$ is the only Nash Equilibrium of the electoral game. Let $m'_L \in A$ be such that $m'_L = y$. Since $\# \{i \in N \ / \ y \ P_i \ x_{maj}(P_N)\} > \frac{n}{2}$, $(w_L; y)$ is the resulting electoral-outcome when $m'_L$ and $m_R$ are the candidates' announcements. By assumption, $(w_L; y) \ P_L \ (tie; x_{maj}(P_N))$, so announcing $m'_L = y$ is a profitable deviation for candidate $L$ when $m_R = x_{maj}(P_N)$, which contradicts that $m_L$ and $m_R$) is a Nash Equilibrium of the electoral game.

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Proposition 2 shows that having $x_{maj}(P_N)$ as a Nash Equilibrium outcome of the electoral game is guaranteed when the issue-by-issue majority voting outcome is a Condorcet winner.

**Proposition 2.** *Let* $(P_N, \tau_L, \tau_R)$ *be a society such that* $x_{maj}(P_N)$ *is a Condorcet winner at* $P_N$. *Then,* $x_{maj}(P_N)$ *is a Nash Equilibrium outcome of the electoral game for every* $P_C$ *consistent with* $(\tau_L, \tau_R)$.

**Proof.** Let $m_L = m_R = x_{maj}(P_N)$. Note that $(tie; x_{maj}(P_N))$ is the resulting electoral-outcome for these announcements. Since $x_{maj}(P_N)$ is a Condorcet winner at $P_N$, for each $m'_L \in A \setminus \{x_{maj}(P_N)\}$, $(w_R; x_{maj}(P_N))$ is the resulting electoral-outcome when $m'_L$ and $m_R$ are the candidates' announcements. By preference for being in office, $(tie; x_{maj}(P_N)) \ P_L \ (w_R; x_{maj}(P_N))$, so announcing $m'_L$ is not a profitable deviation for candidate $L$ when $m_R = x_{maj}(P_N)$. The analysis for candidate $R$ follows an analogous reasoning. Therefore, $m_L$ and $m_R$ are a Nash Equilibrium of the electoral game.

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Theorem 1 states necessary and sufficient conditions for the issue-by-issue majority voting outcome, that is, $x_{maj}(P_N)$, to be the unique Nash Equilibrium outcome of the electoral game.

**Theorem 1.** *Given any society $(P_N, \tau_L, \tau_R)$, $x_{maj}(P_N)$ is the unique Nash Equilibrium outcome of the electoral game for every $P_C$ consistent with $(\tau_L, \tau_R)$ if and only if $x_{maj}(P_N)$ is a Condorcet winner at $P_N$ and:*

*(i) $x_{maj}(P_N) = \tau_c$ for some $c \in C$, or*

*(ii) candidates are maximally top-differentiated.*

**Proof.** We prove this theorem by showing the following two claims.

CLAIM 1 (Necessity). *If $x_{maj}(P_N)$ is the unique Nash Equilibrium outcome of the electoral game for every $P_C$ consistent with $(\tau_L, \tau_R)$ then $x_{maj}(P_N)$ is a Condorcet winner at $P_N$ and (i) $x_{maj}(P_N) = \tau_c$ for some $c \in C$, or (ii) candidates are maximally top-differentiated.*

That $x_{maj}(P_N)$ is a Condorcet winner at $P_N$ follows from Proposition 1. By way of contradiction, suppose that neither (i) $x_{maj}(P_N) = \tau_c$ for some $c \in C$, nor (ii) candidates are maximally top-differentiated. Then, (1) $\tau_L^r = -x_{maj}^r(P_N)$ for some $r \in K$, (2) $\tau_R^s = -x_{maj}^s(P_N)$ for some $s \in K$, and (3) $\tau_L^t = \tau_R^t$ for some $t \in K$. Next, we show that there exists some $y \in A \setminus \{x_{maj}(P_N)\}$ such that $m_L = m_R = y$ is a Nash Equilibrium of the electoral game for some $P_C$ consistent with $(\tau_L, \tau_R)$. We distinguish two cases:

- <u>Case 1.</u> $\tau_L^t = \tau_R^t = -x_{maj}^t(P_N)$ *for some $t \in K$.*

  Suppose, without loss of generality, $\tau_L^t = \tau_R^t = 1$ and $x_{maj}^t(P_N) = -1$. Let $Y = \{Y \in A : y^t = -x_{maj}^t(P_N) = 1\}$. By construction, $x_{maj}(P_N) \notin Y$. Let $P_C = (P_L, P_R)$ be a candidates' preference profile consistent with $(\tau_L, \tau_R)$ such that, for each $y \in Y$ and $z \in A \setminus Y$, we have $(w_R; y) \; P_L \; (w_L; z)$ and $(w_L; y) \; P_R \; (w_R; z)$. Let $h \in Y$ be such that for each $k \in K \setminus \{t\}$, $h^k = x_{maj}^k(P_N)$. Since $h \in Y$ we know that $h^t = -x_{maj}^t(P_N) = 1$, so clearly $h \neq x_{maj}(P_N)$. We now show that $m_L = m_R = h$ is a Nash Equilibrium of the electoral game. Note that $(tie; h)$ is the resulting electoral-outcome. Observe that candidate $L$ has no incentives to deviate to some $z \in A \setminus Y$ since by assumption $(w_R; h)$

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$P_L \ (w_L; z)$ and by preference for being in office $(tie; h) \ P_L \ (w_L; z)$. Thus, candidate $L$ would only consider deviations to policies that belong to the set $Y$. Let $m'_L \in Y$ such that $m'_L = g$ where $g \in Y \setminus \{h\}$. Since $g \neq h$, there exists at least $k \in K \setminus \{t\}$ such that $g^k \neq h^k$. By construction, $h^k = x^k_{maj}(P_N)$ while $g^k = -x^k_{maj}(P_N)$. Since $x_{maj}(P_N)$ is a Condorcet winner, by separability of voters' preferences we have $\# \{i \in N \ / \ h \ P_i \ g\} > \frac{n}{2}$. Hence, $(w_R; h)$ is the resulting electoral-outcome when $m'_L$ and $m_R$ are the candidates' announcements. By preference for being in office $(tie; h) \ P_L \ (w_R; h)$, so announcing $m'_L = g$ is not a profitable deviation for candidate $L$ when $m_R = h$. The analysis for candidate $R$ follows an analogous reasoning. Therefore, $m_L$ and $m_R$ are a Nash Equilibrium of the electoral game.

- <u>Case 2.</u> *For every $t \in K$ with $\tau^t_L = \tau^t_R$ we have $\tau^t_L = \tau^t_R = x^t_{maj}(P_N)$.*

  Then, from points (1), (2), and (3), $\tau^r_L = -x^r_{maj}(P_N) = -\tau^r_R$ for some $r \in K$, and $\tau^s_R = -x^s_{maj}(P_N) = -\tau^s_L$ for some $s \in K$. Suppose, without loss of generality, $\tau^r_L = 1$, $x^r_{maj}(P_N) = \tau^r_R = -1$, $\tau^s_R = 1$, and $x^s_{maj}(P_N) = \tau^s_L = -1$. Let $Q = \{Q \in A \ : \ q^r = \tau^r_L = -x^r_{maj}(P_N) = 1$ and $q^s = \tau^s_R = -x^s_{maj}(P_N) = 1\}$. By construction, $x_{maj}(P_N) \notin Q$. Let $P_C = (P_L, P_R)$ be a candidates' preference profile consistent with $(\tau_L, \tau_R)$ such that, for each $q \in Q$ and $z \in A \setminus Q$, we have $(w_R; q) \ P_L \ (w_L; z)$ and $(w_L; q) \ P_R \ (w_R; z)$. Let $h \in Q$ be such that for each $k \in K \setminus \{r, s\}$, $h^k = x^k_{maj}(P_N)$. Since $h \in Q$ we know that $h^r = \tau^r_L = -x^r_{maj}(P_N) = 1$ and $h^s = \tau^s_R = -x^s_{maj}(P_N) = 1$, so clearly $h \neq x_{maj}(P_N)$. We now show that $m_L = m_R = h$ is a Nash Equilibrium of the electoral game. Note that $(tie; h)$ is the resulting electoral-outcome. Observe that candidate $L$ has no incentives to deviate to some $z \in A \setminus Q$ since by assumption $(w_R; h) \ P_L \ (w_L; z)$ and by preference for being in office $(tie; h) \ P_L \ (w_L; z)$. Thus, candidate $L$ would only consider deviations to policies that belong to the set $Q$. Let $m'_L \in Q$ such that $m'_L = g$ where $g \in Q \setminus \{h\}$. Since $g \neq h$, there exists at least $k \in K \setminus \{r, s\}$ such that $g^k \neq h^k$. By construction, $h^k = x^k_{maj}(P_N)$ while $g^k = -x^k_{maj}(P_N)$. Since $x_{maj}(P_N)$ is a Condorcet winner, by separability of voters' preferences we have $\# \{i \in N \ / \ h \ P_i \ g\} > \frac{n}{2}$. Hence, $(w_R; h)$ is the resulting electoral-outcome when $m'_L$ and $m_R$ are the candidates' announcements. By preference for being in office $(tie; h) \ P_L \ (w_R; h)$, so announcing $m'_L = g$ is not a profitable deviation for candidate $L$ when $m_R = h$. The analysis for candidate $R$ follows an analogous reasoning. Therefore, $m_L$ and $m_R$ are a Nash Equilibrium of the electoral

game.

CLAIM 2 (Sufficiency). *If $x_{maj}(P_N)$ is a Condorcet winner at $P_N$ and (i) $x_{maj}(P_N) = \tau_c$ for some $c \in C$, or (ii) candidates are maximally top-differentiated, then $x_{maj}(P_N)$ is the unique Nash Equilibrium outcome of the electoral game for every $P_C$ consistent with $(\tau_L, \tau_R)$.*

That $x_{maj}(P_N)$ is a Nash Equilibrium outcome of the electoral game for each preference profile of candidates consistent with $(\tau_L, \tau_R)$ follows from Proposition 2. It remains to be shown that it is unique. By way of contradiction, suppose that there exists a Nash Equilibrium of the electoral game such that $x_{maj}(P_N)$ is not the resulting outcome. From Lemma 1 we have that there are $m_L$ and $m_R$ such that $m_L = m_R = y$ where $y \in A \setminus \{x_{maj}(P_N)\}$ which are a Nash Equilibrium of the electoral game with $(tie; y)$ as the resulting electoral-outcome. We distinguish two cases:

- Case 1. $x_{maj}(P_N) = \tau_c$ *for some $c \in C$.*

  Assume, without loss of generality, that $\tau_L = x_{maj}(P_N)$. Let $m'_L = x_{maj}(P_N)$. Since $x_{maj}(P_N)$ is a Condorcet winner, $(w_L; x_{maj}(P_N))$ is the resulting electoral-outcome when $m'_L$ and $m_R$ are the candidates' announcements. By preference for being in office and separability of candidates' preferences, $(w_L; x_{maj}(P_N))$ $P_L$ $(tie; y)$, so announcing $m'_L = x_{maj}(P_N)$ is a profitable deviation for candidate $L$ when $m_R = y$. Therefore, $m_L = y$ and $m_R = y$ are not a Nash Equilibrium of the electoral game.

- Case 2. *Candidates are maximally top-differentiated.*

  We distinguish two subcases:

  - Subcase 2.1. *For some $c \in C$, $\tau_c = x_{maj}(P_N)$.*

    We come back to Case 1.

  - Subcase 2.2. *For each $c \in C$, $\tau_c \neq x_{maj}(P_N)$.*

    We distinguish two sub-subcases:

    - Sub-subcase 2.2.1. *For some $c \in C$, $\tau_c = m_c = y$.*

      Assume, without loss of generality, that $\tau_L = m_L = y$. By maximal top-differentiation, $y = -\tau_R$. Let $m'_R = x_{maj}(P_N)$. Since $x_{maj}(P_N)$ is a Condorcet

winner, $(w_R; x_{maj}(P_N))$ is the resulting electoral-outcome when $m_L$ and $m'_R$ are the candidates' announcements. By preference for being in office and separability of candidates' preferences, $(w_R; x_{maj}(P_N))$ $P_R$ $(tie; -\tau_R)$, so announcing $m'_R = x_{maj}(P_N)$ is a profitable deviation for candidate $R$ when $m_L = y$. Therefore, $m_L = y$ and $m_R = y$ are not a Nash Equilibrium of the electoral game.

○ <u>Sub-subcase 2.2.2.</u> *For each $c \in C$, $\tau_c \neq m_c = y$.*

Since $y \neq x_{maj}(P_N)$ by construction, there exists at least $h \in K$ such that $y^h \neq x^h_{maj}(P_N)$. Assume, without loss of generality, that $y^h = 1$ and $x^h_{maj}(P_N) = -1$. Furthermore, by maximal top-differentiation, we know that $\tau^h_L = -\tau^h_R$. Assume, without loss of generality, that $\tau^h_L = y^h = 1$ and $\tau^h_R = x^h_{maj}(P_N) = -1$. Let $m'_R = \tilde{m}_R$ where for each $k \in K \setminus \{h\}$, $\tilde{m}^k_R = y^k$ and for $h \in K$, $\tilde{m}^h_R = -y^h = x^h_{maj}(P_N) = -1$. Since $x_{maj}(P_N)$ is a Condorcet winner, by separability of voters' preferences we have $\#\{i \in N \, / \, \tilde{m}_R \, P_i \, y\} > \frac{n}{2}$. Thus, $(w_R; \tilde{m}_R)$ is the resulting electoral-outcome when $m_L = y$ and $m'_R = \tilde{m}_R$ are the candidates' announcements. Note that $\tilde{m}^h_R = \tau^h_R$. By preference for being in office and separability of candidates' preferences, $(w_R; \tilde{m}_R)$ $P_R$ $(tie; y)$, so announcing $m'_R = \tilde{m}_R$ is a profitable deviation for candidate $R$ when $m_L = y$. Therefore, $m_L = y$ and $m_R = y$ are not a Nash Equilibrium of the electoral game.

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Theorem 1 identifies necessary and sufficient conditions for the two considered procedures to make decisions, that is, by direct vote of voters over each single issue or allowing that decisions are made in a electoral game, to be equivalent in terms of the decision made for each issue when tops of candidates is all that is known about their preferences. We explain now why conditions in Theorem 1 are necessary and sufficient for the outcome of direct democracy being the unique Nash Equilibrium outcome of the electoral game in representative democracy.

We start by proving necessity. When $x_{maj}(P_N)$ is not a Condorcet winner, the existence of a Nash Equilibrium with $x_{maj}(P_N)$ as outcome is not guaranteed. Suppose that there is a candidate who prioritizes being in office.[10] Since $x_{maj}(P_N)$ is not a Condorcet winner, there

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[10]The type of candidate that in Section 2 we identified as "fully-office motivated".

is at least one policy that defeats $x_{maj}(P_N)$ in pairwise comparison. Thus, the office-oriented candidate has incentives to deviate and announce some policy which is preferred to $x_{maj}(P_N)$ by a majority of voters. This would allow her to win the election, which is the most important aspect for such a candidate regardless of the policy to be implemented. For its part, when there is neither a candidate with $x_{maj}(P_N)$ as top, nor are candidates maximally top-differentiated, the uniqueness of a Nash Equilibrium with $x_{maj}(P_N)$ as outcome is not guaranteed. Assume that the tops of both candidates are equal and different from $x_{maj}(P_N)$. Suppose that both candidates prioritize the policy.[11] Then, the top of these candidates, which is different from $x_{maj}(P_N)$, can be sustained as a Nash Equilibrium outcome of the electoral game.

We now show sufficiency of the conditions. Assume first that $x_{maj}(P_N)$ is a Condorcet winner and there is at least one candidate with $x_{maj}(P_N)$ as top. Existence of the equilibrium is guaranteed since both candidates announcing $x_{maj}(P_N)$ is a Nash Equilibrium of the electoral game. By Lemma 1, candidates announce the same policy in equilibrium. Note that a tie between candidates and the implementation of $x_{maj}(P_N)$ is the electoral-outcome in this case. Since $x_{maj}(P_N)$ is a Condorcet winner, no candidate has incentives to deviate and announce a different policy. In case of doing so, the deviant candidate loses the election while her opponent wins and carries out the policy $x_{maj}(P_N)$. But, by preference for being in office, such a candidate prefers to tie and implement $x_{maj}(P_N)$ rather than lose having that policy implemented, so no candidate has a profitable deviation. To show uniqueness of the equilibrium, suppose that both candidates are announcing the same policy but different from $x_{maj}(P_N)$. Announcing $x_{maj}(P_N)$ is a profitable deviation for the candidate with such a policy as top: if she announces $x_{maj}(P_N)$, she wins the election and carries out her top, which is the best possible scenario for such a candidate. Therefore, no policy other than $x_{maj}(P_N)$ can be sustained as a Nash Equilibrium outcome of the electoral game. Assume now that $x_{maj}(P_N)$ is a Condorcet winner and candidates are maximally top-differentiated. Existence of the equilibrium is similar to the previous case. For the uniqueness of the equilibrium, suppose again that both candidates are announcing the same policy but different from $x_{maj}(P_N)$. Consider one issue for which the decision announced by candidates is different from the decision included in $x_{maj}(P_N)$. By maximal top-differentiation, there is necessarily a candidate that, for such an issue, has the decision contained by $x_{maj}(P_N)$ on it as her most preferred decision. Consider

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[11] The type of candidate that in Section 2 we identified as "fully-policy motivated".

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a variant of the policy initially announced by the candidates, in which decisions announced for all the issues remain the same as at the beginning except for the issue at hand, which would now become the decision specified by $x_{maj}(P_N)$. Note that, by announcing this modified policy, the aforementioned candidate wins the election and such a policy is carried out. By separability of preferences and preference for being in office, this electoral-outcome is preferred by this candidate to the initial electoral-outcome in which she tied and a policy more distant from her top was carried out. Thus, there is a candidate with a profitable deviation so no policy other than $x_{maj}(P_N)$ can be sustained as a Nash Equilibrium outcome of the electoral game.

# 4. The Roots Of Opposition Towards Representative Democracy: A Discussion

The necessity and sufficiency of our conditions implies that, as long as at least one of them is not fulfilled, the equivalence between direct democracy and representative democracy in terms of outcomes ceases to exist. In this section, we show how our results help to explain when disaffection for representative democracy may arise in a population. Specifically, we argue that the individual failure of each of our conditions offers an explanation about the different reasons why mistrust in representative democracy systems could emerge.

Assume that $x_{maj}(P_N)$ is not a Condorcet winner relative to the voters' preference profile $P_N$. Buechel (2014) finds that, on our preferences domain, if $x_{maj}(P_N)$ is not a Condorcet winner, then a Condorcet winner does not exist.[12] That means that there is no policy whose implementation a majority of voters agree with. This could be understood as a situation in which voters are very heterogeneous in their preferences, in such a way that given any policy, some majority coalition among voters preferring a different policy can always arise. Such heterogeneity of preferences implies that whatever the outcome of the electoral game, there is another policy preferred by a majority of voters and so voices against the outcome of representative democracy will be always raised. It is noticeable that a society composed of

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[12]Buechel (2014) finds that, on the domain of separable preferences, if there exists a Condorcet winner, then it coincides with the median policy, which in our case is given by $x_{maj}(P_N)$.

citizens with very heterogeneous preferences fits the definition of *fractionalized society* proposed by Esteban and Ray (2008). They conclude that groups defying the existing political institution are more likely to flourish in highly fractionalized societies. In this sense, the threat we identify to the stability of the traditional system of political representation when the outcome of majority voting issue-by-issue is not a Condorcet winner is in line with their findings.

Assume now that there is neither a candidate with $x_{maj}(P_N)$ as top, nor candidates that are maximally top-differentiated. The concurrent absence of both requirements could be perceived as a situation in which representative democracy poses a threat to the representativeness of society's preferences. Having no candidate with $x_{maj}(P_N)$ as top may be due to the increased activity of lobbies and special-interest groups, which prevent the existence of a candidate with the preferences of the median voter. Using data on Swiss public referenda, Giger and Klüver (2016) offer empirical evidence on how lobbying by groups caring about the interests of a specific sector of society encourages members of parliament to deviate from the preferences of their voters when they cast their votes in the national legislature. Also considering Switzerland as a case study, Stadelmann and Torrens (2020) discover that, when deciding on legislative proposals, the weight assigned by politicians to the preferences of special-interest groups is higher than the one assigned to the preferences of their constituents. Similar findings have been reached in the case of the United States. Gilens and Page (2014) show how economic elites and organized business-oriented groups have a significant influence on US government policy, while the impact of average voters is negligible. Balles et al. (2018) find that when the aspirations of special-interest groups and the population at large are not aligned, representatives are more likely to vote in line with special interests and against voters' preferences. These pressure groups offer politicians some reward in exchange for acting for their benefit, which in most cases differs greatly from the interests of the majority of the electorate. In this context, social requests for the abolition of representative democracies is a natural reaction to the mistrust that has arisen about the motivations of the political class. In addition, insofar as the activity of these pressure groups influences the position of the representatives in the political spectrum, this could also lead to the non-existence of maximally top-differentiated candidates. The most immediate risk that may then arise would be a failure of electoral competition. Electoral competition between traditional left-wing and right-wing political parties comes to motivate the convergence towards the preferences of the median voter (see Hotelling, 1929; Duverger, 1954; Black et al., 1958; Downs, 1957). It is, therefore, a way to discipline self-seeking

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politicians to act in the best interests of the majority. However, the recent disappearance of the classic distinction between left and right in politics, as a result of the growing influence of lobbies in government policy, compromises that convergence toward the median. Padovano (2013) focuses on the crisis of the Downsian model of political competition and identifies interest groups' activities as a source of deviation from an equilibrium in the median voter's preferences.[13] This circumstance makes people distrust electoral competition, thus motivating the disapproval of representative democracies.

# 5. Conclusion

More and more social movements and political parties are claiming that true respect for the will of a society lies in carrying out, for each single issue, what the majority desires. Given the risk of having self-seeking politicians in representative democracy, these groups defend the better suitability of direct democracy when respecting the interests of society. We have proposed a model to study when a system of representative democracy would be equivalent to a system of direct democracy in terms of the developed policy. We find necessary and sufficient conditions such that, decisions made on each issue in representative democracy coincide with the decisions that would have been chosen in direct democracy by majority voting issue-by-issue, regardless of whether candidates are either policy-motivated or office-motivated. The first condition can be interpreted as the need for some degree of homogeneity among voters' preferences about the suitability of the implementation of decisions yielded by majority voting issue-by-issue. The second condition can be understood as the requirement that at least one of the following circumstance occurs: either there is at least one candidate whose preferences are in line with preferences of society, or candidates have sufficiently different preferences. The concurrent fulfillment of both conditions guarantees that the equilibrium outcome of the electoral game induced by a representative democracy is unique and coincides with the policy chosen in direct democracy. The reason is that, under these conditions, there is no room for a mutually beneficial agreement for both candidates which may violate the interests of the majority. This study has also allowed us to identify the class of societies in which anti representative democracy sentiments can be expected to emerge. When any of these

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[13]This observation in Padovano (2013) applies to a context in which the proposed policies in equilibrium by the representatives converge, as happens in our model.

conditions are not being met, the breakdown of the equivalence between the systems of direct and representative democracy happens. It is then that social demands claiming the need to remove the traditional system of political representation are likely to arise, as a response to the fear that the will of the majority becomes violated under this system. Deeply divided societies, the activity of lobbies and special-interest groups, and the failure of electoral competition stand as the reasons explaining the emergence of mistrust in the systems of representative democracy.

# Appendix A

Example 1 shows several preference relations which are admissible for a candidate in our framework and that vary in terms of the relevance assigned by such candidate to both the policy and being in office.

**Example 1.** Consider, without loss of generality, candidate $L$. Let $K = \{1\}$ and $\tau_L = (\tau_L^1) = 1$. The most preferred electoral-outcome for candidate $L$ will then be $(w_L; 1)$, that is, being in office and decision 1 being carried out for issue $k = 1$. Let $P_L, \bar{P}_L, \tilde{P}_L, \hat{P}_L \in \mathcal{P}_L$ be four preference relations for candidate $L$ where

| $P_L$ | $\bar{P}_L$ | $\tilde{P}_L$ | $\hat{P}_L$ |
|---|---|---|---|
| $(w_L; 1)$ | $(w_L; 1)$ | $(w_L; 1)$ | $(w_L; 1)$ |
| $(w_L; -1)$ | $(w_L; -1)$ | $(tie; 1)$ | $(tie; 1)$ |
| $(tie; 1)$ | $(tie; 1)$ | $(w_L; -1)$ | $(w_R; 1)$ |
| $(tie; -1)$ | $(w_R; 1)$ | $(w_R; 1)$ | $(w_L; -1)$ |
| $(w_R; 1)$ | $(tie; -1)$ | $(tie; -1)$ | $(tie; -1)$ |
| $(w_R; -1)$ | $(w_R; -1)$ | $(w_R; -1)$ | $(w_R; -1)$ |

Note that preference relations $P_L$ and $\hat{P}_L$ could be understood as two extreme cases of fully-office motivation and fully-policy motivation, respectively. At $P_L$ candidate $L$ prioritizes being in office while at $\hat{P}_L$ the policy is given priority. Meanwhile, preference relations $\bar{P}_L$ and $\tilde{P}_L$ could be seen as in-between cases with different levels of office- and policy-orientation. At $\bar{P}_L$, initially there is a greater office-orientation since the candidate still prefers electoral-outcomes in which she is in office, even if her least preferred policy (*i.e.*, -1) is implemented to any other electoral-outcome. However, at one point she starts to care about the policy and consequently prefers the electoral-outcome in which she loses (*i.e.*, $w_R$) but her most preferred policy is implemented to the electoral-outcome in which she would be in office with some positive probability (*i.e.*, *tie*) but her least preferred policy is carried out. For its part, at $\tilde{P}_L$ a greater policy-orientation is perceived at the beginning since the candidate prefers the electoral-outcome in which she is in office with probability less than one but still her most preferred policy is implemented to any other electoral-outcome. Yet, at a certain stage being in office comes into play and candidate $L$ prefers to be in office for sure, even if her least

preferred policy is implemented to the electoral-outcome in which her most preferred policy is executed but she would not be in office.

♦

From Example 1 it can be noticed that, for any candidate, there will be different preference relations that share the same top. As a result, different preference profiles of candidates can generate the same pair of tops $(\tau_L, \tau_R)$. Consider a preference relation $P_R \in \mathcal{P}_R$ for candidate $R$. Let $P_C = (P_L, P_R)$ and $P'_C = (\hat{P}_L, P_R)$ be two preference profiles of candidates where $P_L$ and $\hat{P}_L$ are as in Example 1. Even when $(\tau_L(P_L), \tau_R(P_R)) = (\tau_L(\hat{P}_L), \tau_R(P_R))$, candidate $L$'s motivations vary from $P_C$ to $P'_C$: while at $P_C$ candidate $L$ prioritizes being in office, at $P'_C$ she prioritizes the policy.

# Acknowledgments

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