Which result for which voting rule?

An analysis based on a framed-field experiment on approval and evaluation voting

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Abstract

This paper aims at comparing the influence of voting rules on results of election. The analysis is based on the Framed field experiments on the Approval Voting and (2,1,0) Evaluation Voting rules that took place during the 2002 French presidential election and the 2007 ones, in which majority run-off is used. We compare, for given individual political preferences, the kind of rankings and winners induced by the use of distinct voting rules in actual political settings.

Classification JEL: D71, C93

Keywords: Voting, Field Experiment, Approval Voting, Evaluation Voting, Majority Runoff, Comparing results

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1   Introduction

Even though it is not its unique feature, the idea of democracy is more than often associated with the possibility of voting. Further, the selection of voting rules is an important stake of the kind of democracy we wish to live in. Voting theory teaches us much about the compared properties of different voting rules, or the compared likelihood of certain paradoxes such as the ability to elect or not the Condorcet winner, the Condorcet looser, the Dominated Candidate, and so on (see, among others, Nurmi 1999). Other kind of knowledge concerns the structure of the political landscape: for instance, according to the well-known so-called Duverger law in political science (see Duverger 1951), one round plurality vote should favor bi-partism. Last but not least, it is hearsay that some voting rules favor 'certain kinds of results': such as the fact that they favor more or less extreme candidates, more or less consensual candidates, that the votes gather on a small set of "viable" candidates, and so on. This is the issue we wish to study in this paper.

The notion of 'kind of results' is nevertheless difficult to capture in a theoretical framework for two reasons. Firstly, no substantial interpretation of candidates, electoral positions or political preferences may be captured in the standard social choice framework. Interpretations of preferences or candidates should indeed be given in reference **to** political dimension(s). On one dimension, single-peaked preferences are usually interpreted as a left-right political axis, whatever left and right should mean. Such is for instance the case in a many theoretical models of Political Economy (see Persson and Tabellini 2000) and in some laboratory experiment (see Blais, Laslier, Laurent, Sauger and Van der Straeten among others) —just one dimension may eventually be at stake in the standard lab experiments because of the monetary incentive design which allows to mimic the theory. (Quasi-)field experiments are closer to the real world and capture preferences for which do not fit so easily in the simple one-dimensional framework. In that case multi-dimensional data mining (see Laslier 2006; Baujard, Igersheim and Senné 2009) is required. In both contexts, a 'kind of results' should be given a definition. It could be, for the uni-dimensional case, favoring or excluding extreme candidates, centrist positions, regular left/right candidates. It could be, for the multi-dimensional case, favoring or excluding the consensual candidate for instance.

Secondly, the role of voting rules in influencing 'kinds of results' is conditional, in the sense that it depends on the actual profile of voters' preferences. It is hence necessary to describe some specific profiles of preferences. Simulation may do the job to consider all possible cases, although this is only feasible for small problems. Data based on lab experiments may help to study profiles with specified preferences. Besides, quasi-field experiments are able to provide sound information on profiles (see Laslier 2003; Baujard and Igersheim 2003c ; Baujard, Igersheim and Senné 2009). In such contexts, it is possible to describe the profile of preferences for which a rule is more or less likely to favor a 'kind of result'.

To enlighten the uni-dimensional case, we may use data based on a laboratory experiment whose protocole has been designed by Blais, Laslier, Laurent, Sauger, and

Table 1: Election wins, last two sessions for each voting rule, *in* Blais, Laslier, Sauger and van der Straten 2008

	1R	2R	AV	STV
Centrist candidate	52%	50%	100%	0
Left or right candidates	48%	50%	0	100%
Extreme candidates	0	0	0	0

Van der Straten (2007; 2010, Van der Straeten et al. (2010) 2008), and compare results according to voting rules. For a single-peaked preferences profile as the protocole is enforcing it (see Blais et al. 2010 2008 among others for a minute presentation of the protocole), it is quite straightforward that some candidates may be interpreted as extreme, centrist, left/right candidates. As the preferences are uniformly distributed on the left-right axis, fewer voters are interested in electing extreme candidates; the centrist candidate is the median candidate; there is no reason to favor more left or rightist candidate (the left right axis has no political interpretation). For instance, table 1 provides a picture of the power of different rules to exclude or favor certain kinds of results. Read 1R as one round majority rule, 2R as Two-round majority rule, AV as Approval voting, STV as single transferable vote with Hare transfers.

In this paper, we aim to study how, for certain preferences profiles, a voting rule is more or less likely to favor a type of candidate rather than another, on the basis of quasi-field experimental data. We shall restrict our attention to the comparisons of elections wins and elections rankings for approval voting (henceforth AV), (2,1,0)-evaluation voting (henceforth EV) and two-rounds majority rule (henceforth 2R).

The design of the protocol is based on the experiment of Balinski, Laraki, Laslier and van der Straeten 2003, as decribed in Laslier and van der Straeten 2004. For a presentation of the experiment whose data shall be here used, see Baujard and Igersheim 2007, 2010a. For a presentation of raw results, see Baujard and Igersheim 2009. For a presentation of the different teachings of these kinds of experiments, see Baujard and Igersheim 2010b.

Our data provide straightforwardly the means to compare evaluation voting rule and approval voting. The official voting rule is two-round majority rule. In order to compare official and experimental results, it proves necessary to extrapolate at the national level the data which have been collected during the 2002 or 2007 experiments. The first difficulty for this purpose is due to a possible participation bias: all voters who did vote officially did not show up at the experimental stations; it is possible that non-participating voters over or under-represent any type of electoral preference. A model (See Laslier 2007) is designed to estimate what they would have done if they had participated to the experiment.

Types of results may be considered as types of rankings or types of wins. The problem at stake is to give an interpretation of the type of winning candidate, which would be endogenous to the preference profile. We shall propose definitions of properties of

candidates that are directly dependent on the characteristics of the profile. A new issue then arises: no information on the profiles as such is available, but the result of votes. We shall make no assumptions to reconstruct profiles on the basis of such data, but we will consider these raw materials as relevant for the problem at stake. We will provide definitions of different aspects of their attractiveness. Intuitively, a higher focus for a candidate denotes a higher chance of taking advantage of supports from the voters of his or her rivals. A high dilution for a candidate indicates that voters of the considered candidate have a higher probability to increase their supports to other candidates. The attractiveness of a candidate is perfectly symmetrical if the supports he or she receives are equally distributed among all other political supplies. The questions we may tackle are then the followings. Which voting rule favor candidates with higher (or lower) degree of focus, of dilution, of symmetry, and of combination of these three elements?

On the basis of the given profile of the experiment, we shall confirm the intuitions according to which 1) AV, and even more EV, are more likely to favor "consensual candidate", i.e. candidates with high focus, low dilution, high symmetry than 2R. Yet, in the multi-dimensional case, we shall see that being a consensual candidate does not imply being a 'centrist candidate' on all dimensions. 2) AV and EV favor certain 'little candidates' characterized by high focus yet important dilution over 2R. 3) 2R may favor certain 'extreme candidates' with high focus and very low dilution over AV and EV.

The paper is organized as followed. Section 2**??** presents the model designed to correct representation bias. Section 3**??** defines different aspects of attractiveness, necessary to give a substantial interpretation of the results. Section 4**??** provides first evidence of a link between rules and 'kinds of results' for the given profile of the 2007 French Presidential election.

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