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New electoral systems and old referendums

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Abstract

I discuss the future of electoral systems' design. Two routes are worth investigating. First, new voting procedures can be designed and implemented due to new computing and communication facilities. I illustrate with two positive recent experiments in France and Switzerland. Second, the well-known old referendum needs to be investigated more thoroughly, especially because it is being increasingly popular in a variety of situations. I discuss some issues and directions for its improvement.

Keywords: Approval voting, New Apportionment Procedure, bi-apportionment, referendum.

Introduction

With the development of computing and communication facilities, the approaches of social choice and game theories are being used to design and implement rules in a large and growing number of areas such as market design, assignment mechanisms, recommendation systems and rating procedures on Internet, or electoral systems. I focus here on the latter.

Changing an electoral system is presumably more difficult than setting new venues of exchanges or allocation mechanisms. Though, promising experiments allowing for a broader and fairer voters' expression than the current rules are being conducted. I describe two of them in Section 1. At the same time, I have been struck –as many others- by recent voting events such as the EU referendum in UK, 2016 (the so-called Brexit). In Section 2, I first discuss the UK process in light of social choice theory and the surveys and statistical analysis that have been conducted after the vote; I then consider some issues that could be investigated to improve the use of referendums.

1. Changing the electoral system: two experiments

A set of experiments has been conducted in France to assess the acceptance of new systems for electing the French President. The current system is a two-round vote. According to polls, several times, a Condorcet winner has been eliminated in the first round. There is a call for changing the system to remedy this drawback as well as to allow for a more nuanced and broader voters' expression. In particular, experiments have been conducted to test how voters understand and accept new voting rules. The first experiments tested approval voting in 2002 'in situ' in a number of selected voting posts (see the account in Laslier and Van der Straeten 2008). In the selected posts, voters could vote under approval voting if they wanted to (after receiving some explanation on the rule). These votes had no influence on the electoral outcome as voters also cast their vote to the 'real' election. The test was successful in the sense that the participation was large. Other rules -Borda scores and majority judgment- have been tested

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recently, taking advantage of Internet.² These experiments are encouraging, as they reveal the interest and concern for voting rules of both the population and media.

The second experiment, conducted in Switzerland, is a real one. During a trial period starting in 2004, a new method -hereafter called the New Apportionment Procedure- has been used in the Zurich canton to allocate seats to parties and districts. The method is now definitely adopted in the Zurich canton and some other cantons as well. The main motive for changing the system was to offer a solution to the problem of 'lost ballots', which was highlighted in 2002 by the Swiss Federal Court. In small districts, the low number of seats did not give any chance to small parties to obtain a seat. As a result, some supporters of small parties complained: their votes were lost and, furthermore, they were not treated on an equal footing with the supporters of the same parties in larger districts in which the number of seats at stake enabled their representation. Of course, some ballots are necessarily lost in an election, those in favor of a loser. It was the 'unfair' treatment of supporters of the same party that triggered the reform.

The problem of lost ballots arises in a large number of elections for the representatives of distinct areas in an assembly. Such elections entail two dimensions, a geographical one linked to areas (districts in Switzerland or countries in EU) and a political one linked to parties. A representation is called bi-apportionment to refer to these two dimensions. In many instances, the allocation of seats to areas is pre-determined. When the sizes of the areas widely differ, as is the case for districts in Switzerland or countries in EU, small areas obtain fewer seats than the large ones so that there are lost ballots. Ballots are lost even though the allocation of seats to areas is distorted in favor of small areas, meaning that the ratios of the number of assigned seats to population size decrease in the size. The distortion can be huge. To illustrate, in the EU parliament as of 2017, the largest ratios are those for Luxembourg and Malta, which are more than 11 times those for Germany, France, Spain and UK. This distortion raises a new issue: the parties' representation is distorted as soon as the votes for parties are not proportional across areas between each other. In other words, the distortion in the geographical allocation of seats induces a distortion in the political representation. In particular, a proportional representation of the parties is far from being feasible when the seats to parties are determined in an area on the basis of the votes obtained in that area only, independently of the votes in the other areas. In some countries, electoral rules try to correct distortions by introducing cumbersome features such as a variable number of seats, resulting in 'bugs' as in Italy and Germany.³

Such flaws are corrected by bi-divisor methods, introduced in Balinski and Demange (1989-a and b). At that time, I doubted that the methods would be used for real political elections, mainly because they are not computable by hand. Despite these difficulties, the New Apportionment Procedure (NAP) in Zurich is based on such a method. Pukelsheim (2006) made a tremendous job by implementing the procedure and obtaining the support of the politicians and the population, who accepted the NAP by referendum. Roughly speaking, a bi-divisor method works as follows: the votes are adjusted by 'divisors', one for each party and one for each district, and then rounded up to obtain the number of seats of each party in each district. Divisors thus introduce a link between the votes in different areas, thereby avoiding lost ballots, while keeping the prescribed allocation of seats to districts. They are necessary because of the distortions in the allocation of seats to districts and (to a lower extent) the indivisibility in the seats. Although the outcome is not computable by hand, voters can easily check it once they know the divisors. This might explain why the NAP was adopted by referendum in Zurich.⁴

²For experiments conducted in the 2017 presidential election, see 'Voter autrement' <https://vote.imag.fr/> and <http://www.jugementmajoritaire2017.com/>.

³For a recent account of bi-apportionment problems, see Demange (2012); for a review of electoral systems in various countries, see Simeone and Pukelsheim (2006).

⁴The bi-divisor methods could be applied in other contexts than the political one.

These experiments are promising: voters are open to changes in voting systems and new rules can be defined with the help of computing facilities. Designing new voting procedures is definitely a promising line of research for social choice theory.

I now turn to one of the oldest rules, the referendum.

2. Referendums

The number of referendums has increased in Western Europe (for an analysis of this trend and a classification of referendums, see e.g. Setälä 1999). One factor explaining this trend is the evolution of the EU: proposed changes such as enlargement or new constitution trigger referendums in many countries due to their constitutional rules. Another factor put forward by political scientists would be related to citizens' preferences, specifically to the 'unfreezing' of alignments, according to which voters no longer 'belong' to a party. Misalignments could explain why voters may not want to delegate all decisions to their representatives and increasingly demand referendums on specific topics (as revealed in surveys, see Donovan and Karp 2006, Bowler, Donovan and Karp 2007).⁵

From the point of view of social choice theory, the referendum setting, in which people choose between two alternatives, works well for aggregating either preferences or dispersed information. When individuals differ only in their preferences, the majority rule is well defined and strategy-proof. When they share the same preferences but are uncertain as to which alternative is preferred, the majority rule is more likely than each single individual to select the correct alternative if votes are sincere (the Condorcet jury theorem).

Various works have scrutinized these positive results. The Condorcet jury theorem has been challenged because sincere voting might not constitute an equilibrium behavior under private information, resulting in a biased outcome (Austen-Smith and Banks 1996). The argument however relies on rather sophisticated voters, and has not much bite when the electorate is large with no pivotal player (see e.g. Laslier and Weibull 2013). Another criticism is that the reality is more complex than the two polar cases described above, mixing heterogeneity in preferences and private information on the alternatives. Also, it has been known for a long time that voters may not answer the question but rather signal their mistrust in the current authorities or communicate on a different issue.⁶ So what about the EU referendum in UK, 2016? How does the social choice analysis guide our understanding?

The EU referendum in UK, 2016

Many think that something went wrong. Let us first remark that the mistrust in Cameron government does not seem to have played an important role in the vote, as shown in the references in footnote 7. Consider now sophisticated voting induced by private information. Assuming information to have been determinant in the votes and applying Austen-Smith and Banks argument, the result would have been biased if, knowing that Leave had a chance to win, a voter thought that the proponents of Leave had an information of better quality than those of Remain. But detailed analyses show⁷ that votes were mainly dictated by education, age, ethnicity

⁵These works refer to referendums at the national level. There is also an increasing demand for participatory democracy at the local level.

⁶ See, e.g., Piketty (2000).

⁷ <http://www.bbc.com/news/uk-politics-38762034#share-tools>, <https://www.economist.com/news/britain/21720576-migration-good-economy-so-why-are-places-biggest-influxes-doing-so> and Becker, Fetzer and Novy (2017)

and recent changes in immigration in their area, all of which determine preferences. Of course this does not mean that information did not matter, but probably not private information.

The referendum was incredibly ill prepared with an electorate under fundamental uncertainty. The overall consequences are still to be interpreted' as stated in 'The six flavours of Brexit', *The Economist*, 22 July 2017. As analyses in mid 2017 indicate,⁸ a large majority would prefer a 'soft' Brexit, suggesting that the question was not well formulated. Though, overall, the EU referendum seems to have worked well in the sense that it has correctly aggregated voters' preferences. This is supported by the surveys, which indicate that Leave would have still won a few months after the referendum.⁹ Furthermore, most of those who voted Remain accept the result and do not want a second vote.¹⁰

Has social choice theory something to add, apart from the obvious facts that a referendum should be prepared and the electorate should vote under a clear picture of the consequences? Given the trend towards an extensive use of referendums, and more generally towards participative democracy, there are open issues worth investigating.

How to revisit referendums?

How can the use of referendums be improved? By its very definition, a referendum is simple: it applies to a set of voters who face a binary decision, typically the status quo against a reform. Despite its simplicity, a variety of options pertaining to its organization and design have not been much investigated in social choice theory. Here are a few ones:¹¹

Who is allowed to vote?

Most of the studies start with 'Let N be the set of voters'. The problem of a changing electorate is accounted for in studies in public goods by the 'Voting with their feet' made famous by Tiebout, which reflects a rather extreme form of voting. The design of an electorate has not been much analyzed from a normative point of view (as far as I know). Due to the increased mobility of people, this issue is becoming increasingly important, especially in the decisions bearing on the splitting or merging of populations. The Scottish independence referendum in 2014 and the votes for independence in Cataluña in 2014 and 2017 adopted very different participation rules than the EU referendum in UK, 2016. Should the rule determining the electorate of such referendums be defined more precisely *ex ante*? And how?

Which information on the reform is available?

To help voters assess properly the issue at stake and to incentivize the proponents or opponents of a reform to provide accurate and relevant information on its consequences, the period before the referendum is crucial. Politicians, standard media or social networks provide information. Information from voters can also be elicited by introducing sequential or iterative procedures (keeping in mind that incentive properties are altered). One possibility suggested to me by K. Nehring is to organize a first round bearing on whether a referendum should be organized on a given issue. In the case of UK, if the first round vote on contemplating exiting EU had been

⁸ <http://uk.businessinsider.com/yougov-british-people-have-turned-against-a-hard-brexite-2017-6>.

⁹<https://yougov.co.uk/news/2017/03/29/attitudes-brexite-everything-we-know-so-far/>

¹⁰ <http://whatukthinks.org/eu/questions/if-a-second-eu-referendume-were-held-today-how-would-you-vote/>

¹¹ In the case of a reform versus the status quo, a qualified majority can be used instead of a simple one, raising the issue of how to choose the threshold that determines the acceptance of a reform. This issue is typically tackled in a constitution and has been investigated theoretically from different perspectives contrary to the other issues raised in the text.

positive, this would have forced more discussion and public deliberation on the Brexit program, and presumably a more concrete proposal. Gersbach, Mamageishvili and Tejada (2017) propose two-rounds votes, in which a (randomly drawn) sample of voters votes in the first round and the remaining population in the second. They argue that such a procedure may help solving low turnout due to costly participation. It might also help raising voters' concerns thereby increasing their search for information.

What type of issues can be solved by a referendum and who can initiate a referendum?

Are there better systems than referendums to decide on the splitting or merging of areas? Who should decide on initiating such a referendum? The huge discrepancy in the rules governing the use of a referendum across Western countries explains the large difference in their numbers, with Switzerland and Italy standing apart due to the possibility of 'active' referendums initiated by citizens (Setälä 1999). Peter (2016) empirically studies the interaction between the type of referendum and the turnout in representative elections. She shows that the turnout in representative elections tends to increase when citizens can initiate referendums but not when only politicians can initiate them. This suggests investigating thoroughly the rules governing referendums in conjunction with the other elections taking place in a country.

More generally a promising route for social choice theory would be to analyze the architecture of the set of voting rules governing a jurisdiction. This would fill an important gap since social choice theory has so far focused on the choice of a single voting rule.

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