Towards a New Electoral System

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Abstract

Under the present electoral system every citizen is entitled to voting for only one political party. However, pluralism is a cornerstone notion for democracies and consequently, when voters are entitled to voting for more than one political party, their option tends to extend on the grounds that they are provided with the capability of expressing their opinion holistically and are not confined to a single option. Such a method could be a point system, where each voter possesses a sum of points which are distributed in accordance with the voter's preferences. Consequently, this electoral system could be named "Preference -Point- Based Electoral System" (henceforth PPBES) and it should be noted that current developed would facilitate the existence of the aforementioned electoral system. The present paper aims at presenting a new electoral system, where voters are entitled to multiple options voting for.

Keywords: electoral system, voters, pluralism, point system

1. Introduction

Since the early days of democracy, electoral systems have undergone great shifts and alteration. It should be stressed that during the initial stages of the particular institution, the electoral system used to depend entirely on single member plurality (henceforth SMP)[3]. What is noteworthy is the fact that democracy is intrinsically linked to the notion and concept of satisfaction. In other words, the body of voters tends to gain more satisfaction when the political party they vote for enters the government[4]. Despite the wide range of electoral systems at a global scale, what is cornerstone in a democracy and of utmost importance is the fact that an electoral system should be designed in such a way that it would promote and express voter's intention in an as- clear- way- as possible.

In accordance to Powell research (as cited in Blais, Guntermann & Bodet, 2017), stress should be given on the representation of voters' preferences in government[5]. As it can be assumed, in a democracy it is possible that a voter's intention can be expressed by multiple political parties. Hence, was the voter able to vote for more than a single political party, they would vote probably more than one? Furthermore, they would be entitled to voting for political parties in order of preference. In other words, the body of voters would vote in the first option for the political party that depicts their intention at a greater extent, while the second position would be for the political party that less represents the intention of the voters' body. The present paper is dedicated to presenting and recommending a new electoral system called PPBES.

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As it will be deducted, PPBES would provide the voting body with the opportunity of expressing their voting and political intention much more clearly in light of not being confined to a single option. It can operate in numerous ways as the amount of possible potential option ranges from one to infinity[6].

2. Methodology

The present paper is not based upon literature review. On the contrary, examples and simple mathematics are utilized in order to facilitate and elaborate further on introducing a newly born idea.

3. Preference -Point- Based Electoral System
3.1 Introducing the new system

For PPBES, each voter should have a sum of points (electoral points). For instance, each candidate shall have 150 points which can be distributed. These points consist each voter's electoral power. The point system is of utmost importance and necessary so that each citizen is entitled to the same political power regardless the amount of the political parties they have voted. For instance, voter U having voted a single political party and voter Z having voted multiple political parties have the same political power as each of them has given 150 points, in a different ratio though. Hence, voter U has given 150 points to political party A, while voter Z, who has political party B as first and political party C as second, has given 100 points to B and 50 points to political party C, 150 points in total. In other words, regardless the amount of the political parties voted, the total amount of points that can be given is designated (in our example 150).

To be more specific, the political party collecting the most points would constitute the political party prevailing over the others. The percentages corresponding each political party would result in accordance with the amount of electorate's points. The comprehension of this statement could be facilitated by the use of an example. In case electorate consists of one million voters and the points accounted for each voter are 150, then the electorate's total electoral power will be 150 million points (150×10^6). If political party A collects 60 million points, political party B collects 45 million, political party C collects 30 million points and political party D collects 15 million points, it is assumable that the ratio of the sum points of each political party to the electorate's total electoral power constitutes the percentage of each party. The table below consists an illustration of the above example.

Political party	Percentage
A	$[(60 \times 10^6) \div (150 \times 10^6)] \times 100 = $ **40%**
B	$[(40 \times 10^6) \div (150 \times 10^6)] \times 100 = $ **30%**
C	$[(30 \times 10^6) \div (150 \times 10^6)] \times 100 = $ **20%**
D	$[(15 \times 10^6) \div (150 \times 10^6)] \times 100 = $ **10%**

It should be noted that for the sake of simplification there is an implicit assumption of no abstention. Nevertheless, even in case of abstention, the percentage distributing to each political party would result from those participating in elections in the same way as presented in the above example.

3.2 Points Accounting For Each Option

The issue arising from the analysis above and needs to be addressed concerns the process in which points will be given to each political party in case that more than one is voted. According to the process to be followed, each succeeding party will receive half points in comparison to the preceding party. In other words, the party of second choice will receive half points of the first-choice party (i.e first choice political party will receive twice the points distributed to the second- choice party). Likewise, the third- choice party will receive half points of the second- choice party and hence, an equation can be formulated:

Y= x + 2x + 4x + …..nx (Relation 1), where
Y= points given to each voter (electoral power)
x = points accounting for the least preferred political party
2x= points accounting for the penultimate political party
n = n^{th} multiple of 2 for any number of x greater than 1, where $n \in \mathbb{N}^+$
nx = points accounting for first- choice political party
Logically, if only one party has been voted for then Y= x.

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[6]It goes without saying that options cannot be ad infinitum due to the finite number of the political parties.

The above method is based on the reasoning that if the first political party did not exist, e.g. party A, the voter would vote for as the first the party they voted as the second, e.g. party B. In other words, a voter who voted for two parties, party A as number one and party B as number two, would vote only for party B if party A did not exist. The same applies also between the 2nd and 3rd party, if the party that was voted as the second one did not exist, the voter would vote as second the one that they voted to be the third. The same applies to every position accordingly, that is, 3rd and 4th, 4th and 5th and so on.

This method ensures that the party which was voted by someone as the first one will get most of the points in comparison to the total amount of points of the rest of the parties. This is important because the first party gets more than **50% of the voter's points** and this reflects his main preference. The first party has to maintain the majority of the points since it is the first option. The points it gets should not be less than the points of all the other parties as a whole, as the other parties constitute alternative options. It would not make sense if the party someone voted as the first one, that is, their first dominant choice, concentrated less electoral power than their alternative choices. This would be against democracy. **Since a party was voted as the first one, by a voter, it should take the majority of points, irrespective of the number of parties voted afterwards**.

3.3 Defining total points (electoral power)

The next issue has to do with the total points of each citizen. To define the points, we should first define the number of political parties that can be voted by the citizens. In other words, the total number of a citizen's points is different if they can vote for three parties, different if they can vote for four, and so on. The reason for this is purely mathematical. The aim is to avoid points with decimal digits, which in some cases may be irrational numbers (numbers with infinite decimal digits). This would first of all make collecting points difficult for every party and secondly, if there were an irrational number, the point collection would not be accurate. This last phrase is explained below with an example.

Suppose that there are two voters, U and Z, who can vote for up to 3 parties and their electoral power amounts to 150 points. Suppose that U votes for one party, let us say party A, and Z votes for 3 parties, let us say party B as the first, party C as the second and party D as the third.

From **Relation 1** it is derived that the points voter U will give to the sole political party they voted for amount to:
x=150
For Z respectively the following applies:
x+2x+4x=150=> 7x=150=> x≈21.4286

where x are the points that correspond to party D, namely the political party that was voted as the last one among the three. As we can see, number 21.4286 is not an easy number to collect points. In fact, the result of the division 150÷7 is a 13-digit number (21.4285714285714). It is definitely not easy to count the points using numbers with 13 or more decimal digits. So, in our example, <u>the third chosen party</u>, that is party D, will get **21.4285714285714 points**, <u>the second chosen party</u>, namely party C will get, 21.4285714285714×2= **42.8571428571429** points and finally the first chosen party, that is party B, will get 42.8571428571429×2= **85.7142857142857** points (it is necessary that 21.4285714285714+ 42.8571428571429+ 85.7142857142857= 150). The points of every party can be shown in the table below.

Political Party	Points
A	150
B	85.7142857142857
C	42.8571428571429
D	21.4285714285714

Precise counting of the points is impossible when there are irrational numbers, since it is not feasible to count infinite decimal digits. In such a case the total number of points given by a voter differs from the one they are entitled to[7].

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[7]If the electoral power is 100 points and one voter votes for two parties then the second party he chose will get 100÷3= 33.333…….. points, the result is an irrational number and full recording of points becomes impossible. The same applies to the points of the first party (33.333……×2= 66.666…..). So if we add 33.3333+66.6666= 99.9999 points. But 99.9999≠100, so the

So, for the aforementioned reasons, the number of political parties that someone can vote for must be defined first, and then we can define the electoral power. In the example, where 3 parties can be voted for, the electoral power of every voter could correspond to 21 points. These points do not have decimal results.

Voter Z would give x+2x+4x=21=> 7x=21=> x=3 points to party D, which was voted third. Accordingly, 3×2=6 points to party C, which was voted second, and 6×2=12 points to party B, which was voted first. Respectively, voter U would give 21 points to party A which is the only one they voted. The points that each party collected can be shown in the table below.

Political Party	Points
A	21
B	12
C	6
D	3

Basically, contrary to 150 points, counting with 21 points is easier and more accurate. It should be noted that the 21 points constitute "good" electoral power when voters can vote for up to 3 parties. If they can choose more parties, then there will not always be whole numbers in points, similarly to 150 which results in decimal numbers with 3 parties. We basically want a total number of points, for the number of options we have set, which always results in a whole number for every possible choice.

Finding this number is achieved by using the Least Common Multiple (LCM). If we want every voter to select up to two parties then we get x+2x=Y. In this case we have to find the LCM of 3 which is found by x+2x=3x. Number 3 is a factor of x if we add all the xs. Obviously, the LCM of 3 is 3, so the points of a citizen will be 3. If we want every voter to be able to select up to three parties, then we get x+2x+4x=Y. In this case we have to find the LCM of two numbers, 3 and 7. Number 3 because when the voter votes for two parties, instead of three, the relationship x+2x=Y applies. Number 7 because when the voter votes for three parties the relationship x+2x+4x=Y applies. The LCM of these two numbers, 3 and 7, is 21, and as a consequence a citizen will have 21 points. Respectively, if we want every voter to select up to four parties, then we get x+2x+4x+8x=Y. In this case we have to find the LCM of three numbers, 3, 7 and 15. Number 3 because when the voter votes for two parties instead of four, the relationship x+2x=Y applies. Number 7 because when the voter votes for three parties, instead of four, the relationship x+2x+4x=Y applies. Number 15 because when the voter votes for four parties the relationship x+2x+4x+8x=Y applies. The LCM of these numbers, 3, 7 and 15, is 105, and as a consequence the points a citizen will have will be 105. The points the voters will have for a number of possible options between 2 and 7 political parties are presented in the table below using the LCM method.

Number of options	Points(LCM)	Relation
2	3	x+2x=3
3	21	x+2x+4x=21
4	105	x+2x+4x+8x=105
5	3255	x+2x+4x+8x+16x=3255
6	9765	x+2x+4x+8x+16x+32x=9765
7	1240155	x+2x+4x+8x+16x+32x+64x=1240155

4. Implementation of the electoral system

It is worth pointing out the fact that current information systems enable the implementation and application of the Preference -Point- Based Electoral System. Such an electoral system could operate with the assistance of barcodes. To be more specific, each political party would correspond to a code (id code) of a central data base. During the count of votes, each voter's option would be scanned and registered in the corresponding code of the data basis. Simultaneously, the points corresponding to the political party would be registered as well.

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voter gave a different number of points than the one he is entitled to. In fact because 100>99.9999 the voter has less electoral power than the one he is entitled to.

For instance, during the count of vote's procedure, in case that voter U has voted for the political party A, their ballot paper would be scanned and automatically the points corresponding to the political party A would be registered in a data base. This will also apply to voter Z having voted three political parties, political party B as first, political party C as second, and political party D as third option. During the count of votes procedure, the ballot paper would be scanned and the points corresponding to the political parties B, C, D would be registered according to the sequence and the amount of options.

It should be stressed that this way other essential data could be recorded as well. For example, it could be shown how many political parties have been voted for on average, which political parties have been voted as first or second options multiple times, how options have been combined and if parties with similar ideology have been voted for. Such data would be useful not only for the political parties and political analysts but for the citizens as well.

5.   Feasible implementation

Similarly to a number of current electoral systems, in the Preference -Point- Based Electoral System the voters could use ballpoint papers as well. This particular ballpoint papers would include what is currently included in a conventional ballpoint paper such as the name and the logos[8]. However, in addition to the aforementioned elements, a sticker with the code of the political party would be also comprehended. In other words, this sticker would function as a barcode. For reasons of convenience and in order misunderstanding to be avoided, it is suggested that the barcode sticker should also contain the name and the logo of the political party it stands for.

When the voter reaches the voting station, apart from the ballpoint paper and the envelope, they would be given an additional sheet of paper. In this paper, which we are going to name *form of political preference statement*, the voter would register the political party they wish in order of preference. Furthermore, in order any attempt of distortion to be avoided, the competent authority of holding elections would have already integrated a unique id number in the *form of political preference statement*. Consequently, the same *form of political preference statement* could not be registered twice. In case that the same id number is scanned more than once, the options would not be recorded in the data base. Below an indicative form of political preference statement is presented.
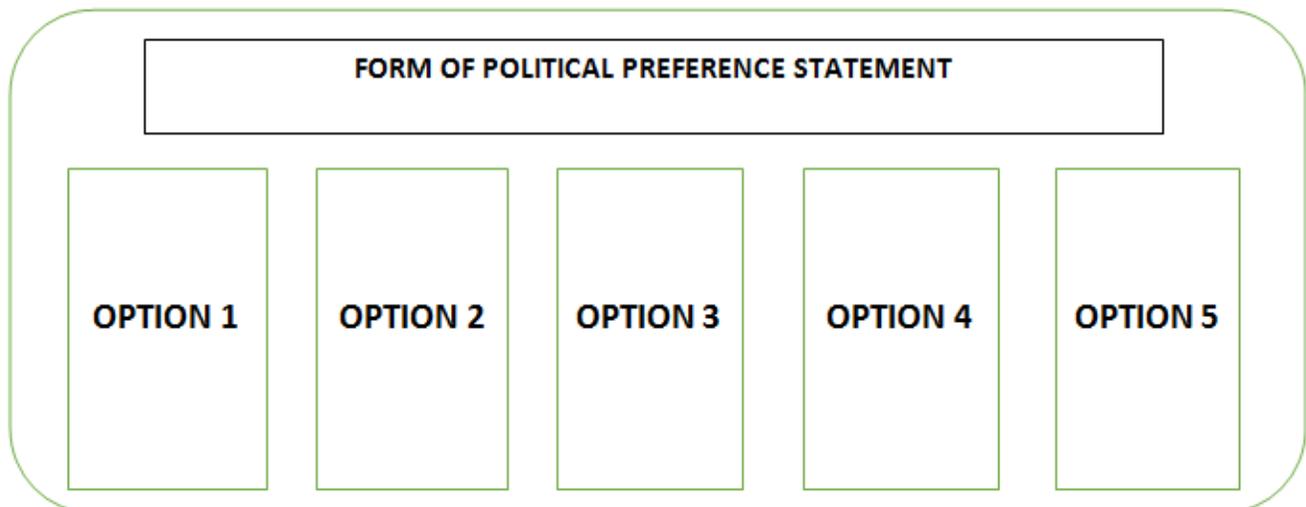
According to the above form of political preference statement, the voter is entitled to five options. In particular, being given the form, the voter would stick the sticker from the political party's ballpoint paper in the desirable position. Their first choice would be fitted in position "OPTION 1" and the other options would succeed accordingly. Having completed the form of political preference statement, the voter would put it in the envelope and cast in the ballot box. When voting has finished, the forms of political preference statement would be scanned and the results would be casted in a central data base. This way the vote counting would be less time- consuming, the likelihood of a mistake would be reduced, and the possibility of vote distortion would be considerably minimized.

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[8]Traditionally in a ballpoint paper the names of the candidates are enlisted. However, for simplicity reasons this step is skipped.

Taking the above into consideration, it should be stressed that the electoral system having been analyzed in this paper needs to be accomplished is the broad use of Information Technology. It is urged that programming language consist a tool of utmost importance as well as their combination with political will.

6. Conclusion remarks

"Electoral systems matter". This is a phrase by M. Gallagher and Paul Mitchell and it is more than true. Electoral systems constitute the manifestation of indirect democracies[9] and are able to highly increase the level of voters' satisfaction. Democracy consists of the composition of pluralism, which would lead to further development of societies. The above analyzed electoral system with the aid of Information Technology would provide the voters with the opportunity of voting for more than one political party, which will be the practical illustration of democratic institution.

Conflicts of Interest

The authors declare no conflict of interest.

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