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A "winner" under any voting rule?

An experiment on the single transferable vote

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Abstract:

In this paper, we expose the results of a voting experiment realised in 2007, during the French Presidential election. This experiment aimed at confronting the Single Transferable Vote (SVT) procedure to two criteria: simplicity and the selection of a Condorcet-winner. Building on our electoral sample's preferences, we show that this voting procedure can design a different winner, depending on the vote counting process. With the vote counting process advocated by Hare, the winner is Nicolas Sarkozy, while the Coombs vote counting process has François Bayrou as winner. For these two vote counting processes, the details of the experiment are the same and it is shown that the simplicity criterion is respected. However, with regard to the Condorcet-winner criterion, the Coombs method is the only one to elect the Condorcet-winner, i.e. François Bayrou.
JEL classification : C93, D72
Keywords : Field experiments, Elections, Single Transferable Vote, Voting system, Condorcet Winner

Résumé:

Dans cet article nous présentons les résultats d'une expérience électorale réalisée durant l'élection présidentielle de 2007 qui avait pour objectifs de confronter le vote préférentiel transférable à deux critères : la simplicité et la sélection du vainqueur de Condorcet. A partir du profil des préférences des électeurs qui ont participé à cette expérience électorale, nous montrons que cette procédure de vote peut conduire à la désignation d'un vainqueur différent suivant la mèthode de dépouillement employée. Avec la méthode de Hare, le vainqueur est N. Sarkozy, tandis que la méthode de Coombs conduit à l'élection de F. Bayrou. Pour ces deux méthodes, les modalités pratiques du scrutin restent les mêmes et l'expérience a montré que ce processus répond bien au critère de simplicité. Par contre, au regard du principe de Condorcet, seule la méthode de Coombs, pour ce profil des préférences a conduit à l'élection du vainqueur de Condorcet, à savoir F. Bayrou.
JEL classification : C93, D72
Mots clés : Economie expérimentale, Elections, Vote préférentiel transférable, Mode de scrutin, Vainqueur de Condorcet.

> Good sense is, of all things among men, the most equally distributed; for everyone thinks himself to be so abundantly provided with it, that even those who are the most difficult to satisfy in everything else do not usually desire a larger measure of this quality than they already possess. In this matter, it is not likely that everyone is mistaken: this is rather a testimony that the power of judgment and distinguishing right from wrong is actually what we call good sense or reason, and this is naturally equal in all men (…)"
> Descartes, 1637, *Discourse on Method*, §1-1

A number of electoral experiments have recently been conducted, notably in France, with the aim of testing current electoral systems, and showing the qualities of alternative ones. For example, Baujard and Higersheim (2007) conducted experiments on ranked choice voting and approval voting, which allow voters to express the intensity of their preferences. In addition, Balinski and Laraki (2007, a & b) tested the majority judgment system, in which voters can judge the degree to which they believe a candidate would be suited to take on the role of president. Furthermore, Lewis-Beck and Wittrock (2007) show how a two-round electoral system can be more favorable to extremist candidates than a one-round system, confirming an interest in studying other electoral systems.

The results of the experiments, also confirmed by theoretical results (cf. Nurmi, 2002), show that no two electoral systems are equal. Thus, when there is only one seat to be filled (in a presidential election, for example), the use of a two-round majority electoral system leads voters to make a choice in the second round, based on a reduced political selection compared to the first round. Voters' powers are therefore largely reduced in this case, a fact that was initially signaled by Hare in 1873, defending an electoral system that we now know as the Single Transferable Vote (STV). Under this voting procedure, in which only one round is necessary, the voter is asked to rank all candidates, or a selection of them, by order of preference. According to Hare (1973), this voting procedure brings "to the duty of voting reflection, judgment and moderation," and consequently, "by using the opportunity to separate, distinguish between and express every form of political opinion," gives strength to the representative mandate.[1]

We can immediately note that such an electoral system is perfectly consistent with Descartes' theory of shared good sense, and that it is possibly even easier for a voter to have to rank several candidates by order of preference, rather than having to

[1] For a detailed presentation, see Reilly and Maley (2000).

select one amongst all those that present themselves. Grofman and Feld (2004) also show formally that the STV satisfies the simplicity criteria better than the alternatives.[2] Likewise, Farrel *et al*. (2000) show the practicality of such an electoral system, used in Australia since the beginning of the 20th century, in Ireland (where it has been applied to the presidential elections since 1937) and at the heart of professional associations (including the *American Psychological Association*). Despite this, many opponents to the adoption of this system say that the single transferable vote appears too complicated. Grofman and Feld (2004, p.644, n. 11) also cite the fierce opposition displayed by the Mayor of San Francisco, although the local citizens voted to adopt this electoral system nonetheless, in a referendum in 2002. The advantages of the STV have again recently enabled its adoption elsewhere, in the city of Takoma Park (Maryland, United States, January 2007) and for the Scottish local elections in May 2007.

The first objective of this article is therefore, through an experiment on the French presidential election in 2007, to study whether the STV can offer a credible alternative to majority voting, in terms of simplicity from the voter's point of view.

Apart from simplicity, a certain number of other criteria have been put forward and discussed in the literature on the subject, attempting to evaluate different electoral systems (cf. Nurmi, 2002, for a synopsis of electoral systems). Currently, amongst the most discussed criteria, selecting the Condorcet winner and the idea of *Condorcet efficiency* is probably fundamental. To recap, the Condorcet winner, if one exists, is the candidate against whom no other candidate is preferred. In bilateral opposition to each other candidate, he/she would be elected with a majority. An electoral system, which would systematically lead to the Condorcet winner being put at a disadvantage, would in all likelihood lead to a rapid reconsideration of the country's political institutions. If such a difference between voters' preferences and election results is not systematic with a majority vote, this electoral system does not however necessarily guarantee that the Condorcet winner will be selected (cf. Saari, 1995, but this characteristic had already been shown in Black, 1958). Indeed, using a majority voting system, moderate candidates (potential Condorcet winners) are not necessarily an individual's first choice. A majority voting system therefore does not allow them to influence the voting issue, in contrast to the transferable voting procedure, which allows voters' preferences to be transferred from one candidate to another during the sequences (or repetitions) of the of the vote counting system.

However, the arguments regarding the selection of the Condorcet winner remain largely theoretical. The second objective of this article is also to use experiments to check whether the STV is effective in allowing the selection of the Condorcet winner, if one exists, and when the profile of people's preferences does not necessarily correspond to the theoretical ideal of unimodal preferences. The difficulty of an electoral system using the single transferable vote is the creation of two distinct vote-counting methods, which can be used to choose the elected candidate: The Hare method (or ranked-choice voting, Hare, 1873) and the Coombs' method (1964). Concerning the latter, Grofman and Feld (2004) show that the Coombs' method always leads to the Condorcet winner being elected, as long as the voters' preferences are unimodal.

Our electoral experiment therefore aims to examine the qualities of an alternative electoral system, which has greater respect for the series of preferences expressed by the electorate, when the single transferable vote is applied. It is shown

[2] See Laslier and Van der Straeten (2004, 2008) for an experiment showing that, in practice, approval votes equally satisfy the simplicity criteria.

that the two criteria - simplicity and the selection of a Condorcet winner – can be checked for.

The article is organized as follows. In a first section, we present the single transferable vote and the counting method in detail, along with the practical details of the electoral experiment and the official results. The second section confronts the initial results of the experimental vote and the simplicity criteria. The results using the Hare vote counting method are outlined in the third section. The fourth section presents the results that were obtained using the alternative vote counting method, namely that of Coombs. Finally, the last section studies the existence of a Condorcet winner. The conclusion summarizes our results and proposes future research possibilities.

1. The Single Transferable Vote

The term 'single transferable vote' in reality refers to two different processes, which can only be distinguished by the vote counting methods: The Hare method (*ranked choice voting*) and the Coombs' method. The first is used for the presidential elections in Ireland and Sri Lanka, and was organized for the national elections on the islands of Fiji and Papua New Guinea at the end of the 1990s and the beginning of the 2000s. Australia has used ranked choice voting for elections to the House of Representatives (or Lower House) since 1918, and finally, at a local level, this method has been employed for the San Francisco municipal elections since 2002. No examples exist showing the application of the Coombs' method.

Whichever of the methods is applied, voters receive a single ballot paper, containing the names of each candidate, and they must rank them in order of preference. Number 1 refers to the voter's first choice, number 2 to the second, and so on. The voter is not forced to rank all of the candidates.[3] Considering that the vote can be transferred to each candidate that the voter gives a rank for, the voter refusing to give a rank to a candidate means refusing to give that candidate a say at any point in the vote counting process. If no candidate wins the majority of the votes when they are counted (the number of votes corresponds to the number of ballot papers placing the candidate as first choice), the candidate with the *worst result* is then eliminated, and votes for the second choice candidate on each paper ranking the eliminated candidate as first choice are then transferred to that candidate. This process is then repeated until one candidate obtains more than half of the votes cast. The distinction that can be made between the Coombs' and Hare methods is based on the way of defining the candidate with the *worst result* (see below and Grofman and Feld, 2004).

Compared to a two-round electoral system, one of the advantages of this system is that it avoids voters going back to the polls, as all preferences are expressed from the first and only round. It thus allows the voter to fully express his or her preferences between all listed candidates. The single transferable vote is based on the largest possible electoral participation, avoiding supporters of lesser candidates refusing to take part in the second of a two-round system. On the other hand, ranked choice voting could potentially allow the election of a candidate representing the first choice of a small portion of the electorate. Therefore it does not necessarily favor the "larger parties." As it is based on initial preferences, voters' choices are, by definition,

[3] This point does however vary between elections. In the Australian case, the voter must complete the entire ballot, but in San Francisco, the voter only needs to rank three candidates.

not influenced by the first-round results, and therefore by the opinions of other voters which were expressed in the first round. As the voters have to make their choices just once and allow their vote to be transferred to the other ranked candidates, this electoral system greatly reduces voters' incentives to not vote sincerely. However, this electoral system does not completely eliminate the possibility of manipulation (insincere voting, cf. Peress, 2008).

A final advantage to this voting procedure, whichever vote counting method is applied, is that, as the two-round electoral system, it produces a majority winner.

One has to note one inherent difficulty with this electoral process: vote-counting stations. The votes in this system, in contrast to the current two-round voting system, cannot be counted in local offices[4], with the national result being the aggregate results of all local offices. With the single transferable vote, the sum of all vote counts in each counting station does not lead to the same result as the count on the total number of ballot papers from the entire electoral district. The count should be made only once and at a district level, whichever counting method is applied. Furthermore, as all ballot papers ranking an eliminated candidate as first choice need to be reprocessed, the counting process is strongly facilitated through the use of information technology, as soon as the number of voters increases. Equally, voters could find this system more complicated than the current electoral system. On the face of it, choosing **one** single candidate can seem easier than selecting a list of candidates and ranking them by order of preference. However, as we will see, this suggestion seems to have only a weak empirical impact.

1.1. The Hare Method (Ranked Choice Voting)

According to this method, the *worst result* will be defined based on the way in which *support can be brought together*: The candidate with the lowest number of votes as first choice is eliminated, and these votes are then recounted and passed on to the candidate which the voter placed as second choice on the ballot paper. If a candidate receives the majority of votes as a result of this transfer, she is elected. Otherwise, the process will be repeated until a majority winner is identified (Hare, 1873, Farrell *et al*. 1996).

This electoral system is therefore based on relative opinions, as is the majority electoral system. In general, but not systematically, it leads to similar results, as the vote-counting method is actually very similar to that of a two-round electoral system. In the counting procedure, the later repetitions can be seen as another fictional voting round in the electoral process. The worst candidate is eliminated in each *round*. As voters express the order of their preferred candidates, they are not required to return to vote again in further rounds. The only task to be done between each of these virtual voting rounds is to alter the ballot papers, transferring the votes to the candidate immediately following the eliminated candidate, and to keep a score for each of the candidates who remain on the list. In the 2007 French presidential election, a two-round electoral system, the 10 worst candidates were eliminated between the first and second rounds, but with the single transferable vote, candidates are eliminated one at a time. Such a difference is not only formal, in certain configurations it can affect the final results of an election. This was the vote-counting method that was outlined in the letter to voters, used to announce and present the experiment.

[4] Or simply for information, to know how voters in the area voted.

1.2. Practical Details of the Electoral Experiment

The electoral experiment was conducted in two of the eleven voting districts in the town of Faches-Thumesnil: District no.1 (Ecole Pasteur-Curie) and district no. 6 (Centre Médico-social). The voters in the two districts received a letter, signed by the Mayor of the town and the Dean of the Economic and Social Science Faculty (cf. Annex D). The letter informed voters that the experiment would take place during the first round of the presidential election, and of its practical details, also inviting them to take part. On the back of the letter, an explanatory note presented the single transferable vote and how it works. After having voted, the voters were then invited to take part in the electoral experiment in a voting office adjacent to the official office. The voters taking part in the experiment were reminded orally of the practical details, just before they filled in their ballot papers. We reconstructed all characteristics of a real polling station, including booths, boxes and ballot papers (cf. Annex A).

1.3. The official and aggregated results of districts 1 and 6 in Faches-Thumesnil

Considering that the voting procedure allows a second round of voting to be avoided, the experiment naturally took place on April 22, 2007. The aggregated results of districts 1 and 6, shown in a table in Annex B, present the way in which the voters cast their votes for all presidential candidates in the official election. The national results are also presented in the same table.

If we compare the results, we can see that participation was a little lower in the districts where the experiment took place, in both the first and second rounds, but the general results are very similar to those observed at a national level. The correlation coefficient between the two sets of results is greater than 0.99, showing that the two data sets are practically identical. Furthermore, the statistical tests that were conducted do not show any significant difference between the two sets of results.

2. The single transferable vote and the simplicity criteria

If we look at the criteria, which are set out to define a “good” electoral system, it is clear that simplicity is essential if democracy is to work successfully. A relatively complicated electoral system could eventually hinder universal suffrage, in which case it would no longer be citizens that appear on a *census* who vote, but those who understand the *sense*, the practical details of an electoral system.

Analyzing the results of the experiment regarding the simplicity principle, we can attempt to confirm that the electoral system presented to voters was well understood, and the results have not been marred through misunderstandings. We can note first of all that the experiment was warmly welcomed by the voters in the districts involved, as 60.30% accepted to take part (cf. table 1). Among the ballots completed by voters, a little less than 7% proved to be blank or spoilt. However, to understand the participants’ level of comprehension of the proposed electoral system, a closer analysis of the blank and spoilt votes was conducted (cf. table 2). Amongst the blank and spoilt votes, around 3% were abusive, and around 12% were genuine blank votes. In total, these two categories represented 1.04% of votes, a rate which is, once again, very comparable with the complete sample of the two districts which took part, which received 1.51% of ballots as either blank or spoilt. The remainder of the

blank and spoilt ballots (85% of the blank or spoilt papers in our sample) were those on which the voters expressed their choices with a simple cross, or contained a mistake in the ranking of candidates.[5] These two error categories can be assimilated to a lack of understanding of this electoral system on the part of the experiment's participants. Therefore, mistakes made by participants represented a total of 5.94% of ballot papers. If this figure seems somewhat high, it is in fact relatively low when we consider that the experiment did not benefit from a strong mobilized campaign, explaining the new voting system to voters (who received a letter one week before the election and then oral explanations at the polling station), which would be carried out if this electoral system were to be adopted. We can note that in Australia, a country where this electoral system has been used in legislative elections since the beginning of the century and where voting is obligatory, blank and spoilt votes accounted for 3.8% of ballots in the 1998 election.

TABLE 1 – Participation in the electoral experiment

	Number	**% of official votes**
Voters	960	60.30
	Number	**% of voters in experiment**
Blank or Spoilt	67	6.98
Votes Cast	893	93.02
Number of ballots according to number of candidates ranked		
Number of candidates ranked	**Number of ballots**	**in %**
1	30	3.36
2	67	7.50
3	163	18.25
4	95	10.64
5	78	8.73
6	37	4.14
7	17	1.90
8	9	1.01
9	3	0.34
10	9	1.01
11	15	1.68
12	370	41.43

[5] Some of the mistakes can be attributed to us. We neglected to precise in the letter addressed to the participants that ranking candidates with an equal number would not be allowed.

TABLE 2 – Nature of blank and spoilt ballots.

	Number	in %
Abusive	2	2.99
Blank	8	11.94
Cross	22	32.84
Ranking error	35	52.54
Total	67	100

One characteristic of this electoral system, which can appear complex at first sight, is the requirement to rank (all or some of) the candidates. From this point of view, the results are again reassuring. Indeed, if we count the ballots in terms of the number of candidates ranked, we see a bimodal distribution, with a first peak between 3 and 4 ranked candidates (18.25% and 10.64% of ballots respectively, cf. table 1) and a second peak at 12 candidates, with more than 41% of voters. This result shows without question that a large number of voters did not find it prohibitive to rank the candidates in this way, only 3.36% of voters ranked only one candidate. However, this does not necessarily signify that the choice to rank only one candidate means the voter has difficulty in ranking a certain number of candidates, as it could represent a sincere vote (one single candidate deserves their vote, and they will not allow it to be eventually transferred to another candidate during the counting process).

Finally, it would appear that the level of mistakes and blank votes is relatively low, and that the need to rank candidates did not create a barrier against participation in this electoral system. Coupled with voters' high level of participation in this experiment, the results lead us to consider that the single transferable vote can be considered as a relatively simple, and therefore practical, electoral system. This result is not really surprising when we consider that this system has been in place and working in the Australian Lower House since 1918, and in the Irish presidential elections since 1937.

3 The single transferable vote results (Hare method)

The first candidate to be eliminated is Gérard Schivardi (cf. table 3), as only a single voter cast him in first position (meaning that he received 0.11% of votes cast). This ballot indicated Olivier Besancenot as second choice candidate. With Schivardi eliminated, this voter's choice is therefore transferred to Besancenot.[6] After counting the votes (cf. table 3), Besancenot's result now improves (passing from 6.49% after the first repetition to 6.61% after the second), with all other candidates' scores remaining unchanged. In this second repetition, the candidate with the worst score according to the Hare method is Frédéric Nihous. After this candidate is eliminated, the ballots placing him in first position have the votes transferred from this candidate to the candidate ranked in second position. After this transfer, we recount the votes received by each candidate to identify the one with the worst score (3rd repetition), and so on.

[6] In annex C, we explain the manner in which votes are transferred during each repetition of the voting process, based on this ballot paper.

TABLE 3 – vote count according to the Hare method.

Candidate	Repetition (% of votes received)										
	1	2	3	4	5	6	7	8	9	10	11
Besancenot	6.49	6.61	6.72	7.17	7.17	7.74	8.98	10.59	**12.42**	-	-
Buffet	2.13	2.13	2.24	2.24	2.24	2.81	**3.37**	-	-	-	-
Schivardi	**0.11**	-	-	-	-	-	-	-	-	-	-
Bayrou	21.16	21.16	21.28	21.64	21.97	22.45	22.78	22.86	23.25	**27.45**	-
Bové	1.68	1.68	**1.68**	-	-	-	-	-	-	-	-
Voynet	2.02	2.02	2.02	2.24	**2.24**	-	-	-	-	-	-
De Villiers	1.90	1.90	1.90	**2.02**	-	-	-	-	-	-	-
Royal	22.28	22.28	22.28	22.53	22.53	23.12	23.23	24.44	25.17	32	**45.85**
Nihous	0.45	**0.45**	-	-	-	-	-	-	-	-	-
Le Pen	6.72	6.72	6.83	6.84	7.51	7.52	7.52	**7.77**	-	-	-
Laguiller	2.24	2.24	2.24	2.47	2.58	**2.58**	-	-	-	-	-
Sarkozy	32.81	32.81	32.81	32.85	33.74	33.78	34.12	34.35	39.16	40.55	**54.15**

Using this procedure, the candidates to be eliminated after Schivardi and Nihous, in order, are José Bové, Philippe de Villiers, Dominique Voynet[7], Arlette Laguiller, Marie-George Buffet, Jean-Marie Le Pen, Olivier Besancenot and François Bayrou. In the 10th repetition, at which point only three candidates remain (Bayrou, 27.45%, Ségolène Royal, 32% and Nicolas Sarkozy, 40.55%), this method therefore eliminates Bayrou, who had received the least votes. Only Royal and Sarkozy remain on the list. After transferring votes cast in favor of Bayrou, this counting method results in Sarkozy being elected with 54.15% of votes cast, against 45.85% of votes for Royal.

Therefore, *ranked choice voting* (the single transferable vote with the Hare method) leads to a result, which is very similar to that obtained using the two-round system (the official vote). Both systems result in the same winner, Sarkozy, with very similar scores – Sarkozy achieving 53.38% in the official election and 54.15% in the experimental election, and 46.62% and 45.85% respectively for Royal.

This result is not really surprising, as numerous similarities exist between the two electoral systems, a fact that we already developed upon in the section that presented this method.

We can however go further in our analysis of the experimental election, on the one hand studying the composition of the electorate eventually voting for one of the two finalists, and on the other hand their levels of attraction, based on the ranking position which was ultimately given to them.

[7] We can see that in this 5th repetition, Voynet shares the worst score with Buffet. They are in a dead heat in terms of votes; therefore we need to determine which one should be eliminated. The electoral process should define these criteria before the vote takes place. We envisaged two possible criteria: eliminate the candidate with the worst initial score (in the first round), in this case Voynet; or eliminate the candidate with the least number of second place votes in this 5th repetition (Voynet 34, Buffet 46). Voynet is therefore eliminated, whichever of the criteria, which would have been upheld at the beginning, is applied.

The first column in table 4 corresponds to the distribution of the electorate whose votes were ultimately cast for Sarkozy, therefore finding themselves competing against Royal in the final repetition of the electoral process. Thus, 1.94% of Sarkozy's voters (in the 11th repetition) initially wanted to vote for Besancenot (ranking him in first position on their ballots). More than 63% of them placed Sarkozy as first choice from the beginning, 9% initially preferred Le Pen, 3% de Villiers and more than 19% Bayrou. Almost 75% of his voters initially voted for a right-wing candidate (including him), or one from the extreme right. Including Bayrou, this figure reaches 95%.

TABLE 4 – Hare: distribution of voters who eventually voted for one of the 2 finalists

	Initial intention (in %)		**Proportion of voters who initially voted for (in %):**	
	Sarkozy	Royal	Sarkozy	Royal
Besancenot	1.94	10.97	15.52	74.14
Buffet	0.22	4.08	5.26	84.21
Schivardi	0.22	0	100	0
Bayrou	19.65	21.43	48.15	44.44
Bové	0.43	3.06	13.33	80
Voynet	0.65	3.32	16.67	72.22
De Villiers	3.02	0	82.35	0
Royal	0	50.77	0	100
Nihous	0.65	0	75	0
Le Pen	9.07	3.06	70	20
Laguiller	0.86	3.32	20	65
Sarkozy	63.28	0	100	0
Total	100	100	-	-

If we now look at each candidate's supporters, whose votes were eventually cast for Sarkozy instead, we find the information in the third column of table 4. Thus, 15.52% of voters who ranked Besancenot as first choice (his supporters) indicated that they preferred Sarkozy to Royal, and therefore voted in his favor during the final run off between the two at the end of the process. In descending order[8], the figure reaches almost 82% of de Villiers' supporters, 75% of Nihous', 70% of Le Pen's, 48% of Bayrou's, then falling to 20% of Laguiller's supporters, and finishing with 5% of Buffet's.

Of the electorate voting for Royal at the end of the process, 50% of her voters had initially ranked her as first choice, 21% had initially ranked Bayrou as first choice and 10% for Besancenot. Interestingly, none of the voters who ranked de Villiers or Nihous in first position ranked Royal ahead of Sarkozy. In terms of the transfer (4th column), we see that, in descending order, almost 85% of voters who placed Buffet as first choice voted for Royal. This rate is as high as 75% of Besancenot's supporters, 72% of Voynet's, 65% of Laguiller's and 44% of Bayrou's. It goes down to 20% in the case of Le Pen's supporters.

The majority of voters (between 65% and 85%) who initially supported another left-wing candidate transferred their vote to Royal rather than Sarkozy. On the contrary, none of de Villier's or Nihous' supporters eventually voted in favor of Royal.

[8] In the case of Schivardi, the share is not of great significance, as only one single voter ranked this candidate in first position.

We notice that, if we add up the numbers for each term in the second and fourth columns of table 4, the total does not reach 100%. The difference represents the proportion of voters who did not rank both Sarkozy and Royal, and therefore did not want for their vote to be transferred to one of the candidates against the other in the counting process. Thus, 48,15% of voters who ranked Bayrou as first choice indicated that they preferred Sarkozy, and 44.44% preferred Royal, meaning that 7.41% of them did not want their vote to be transferred two one of the two finalists chosen using this counting method.[9]

TABLE 5 – distributions of votes according to rankings, where the vote was eventually transferred to one of the two finalists.

	Sarkozy		**Royal**	
	Ballots classing them in position:			
	Number	**in %**	**Number**	**in %**
1	293	63.28	199	50.77
2	132	28.51	96	24.49
3	18	3.89	30	7.65
4	5	1.08	29	7.4
5	4	0.86	9	2.3
6	0	0	8	2.04
7	3	0.65	5	1.28
8	3	0.65	3	0.77
9	2	0.43	3	0.77
10	1	0.22	7	1.79
11	2	0.43	3	0.77
12	0	0	0	0

Around 63% of the voters who eventually voted for Sarkozy ranked him as first choice, and more than 28% of them ranked him as second choice (cf. table 5). Thus, more than 90% of the electorate who voted for Sarkozy against Royal ranked him as either first or second choice on their ballot papers, representing a relatively high level of support.

Of the voters who indicated in their ranking that they preferred Royal to Sarkozy (meaning those that voted for her), 50% ranked her in first position and 25% in second position, a total of 75% for one of these two first positions. We need to go as far as the fourth position to reach 90% of the voters, which proves a lower level of support compared to that of Sarkozy.

4. The Coombs' method

It could be interesting to test the influence that the vote counting method has on the election result. However, we should be very careful when applying the Coombs' method to the ballot papers completed during this electoral experiment. In truth, only the Hare method of vote counting was announced to voters (cf. the letter sent to voters, Annex D), and nothing can ensure that the voters taking part in the experiment would not have altered their ranking if a different counting method had

[9] These ballots are therefore considered to be blank votes for this final round, and they are no longer counted as votes cast. The number of votes cast therefore evolves (by falling) during the vote counting process.

been announced. We therefore explicitly assume in this section that the ranking choices expressed by voters were not affected by the counting method, and that voters gave their true preferences (no manipulation or strategic voting).

The subjects were certainly asked to rank candidates according to their preferences, given as an instruction in the explanatory note and on the ballot paper (see annexes A and D). This could be understood as asking voters to vote sincerely, as long as voters understand the instruction as being a necessity and not a guideline. Two remarks can be made on this point.

Firstly, it could be argued that the instructions given to voters should sufficiently define the electoral system (meaning that they explain *how* the ballot paper should be filled in), without indicating for *whom* the subjects of the experiment should vote. In addition, it is not necessarily shocking to ask voters to rank candidates according to their preferences. In fact, if this reduces voters' tendencies to vote tactically (as a form of manipulation), it would actually improve the perspective usefulness of rankings given by voters, allowing results produced by different methods to be compared.

Furthermore, the wording that was used attempted to explain to the subjects, who were just discovering this type of ballot paper, in the simplest possible way, how to cast their vote.

Moreover, it should be recognized that in the framework of our experiment, the single transferable vote offered voters little opportunity for manipulation. A voter's incentive to manipulate the election is very small as soon as voters form a sufficiently large sample (becoming larger than a small group) and the candidates (or their representatives) are unable to exert their influence over the experiment's participants. Manipulation is even less likely in our experiment as the electoral system which was tested had not previously been seen by the voters, which rules out the possibility of people learning how to manipulate the system easily.

In addition, we assume that voters, when asked to vote by ranking the candidates, rank them according to their order of preference, without conducting an opinion poll. In fact, the communication of opinion poll results does not, in reality, only eliminate undecided voters; in addition they generally do not include all of the candidates in the election (cf. Abramson, 2007). Finally, the ranking system which voters are asked for in a single transferable vote is advantageous in reducing the number of dead heats (as it asks voters to order their preferences), as opposed to an opinion poll or even approval voting (cf. Balinski and Laraki, 2007, a and b).[10]

The Coombs' method (1964) is an alternative to that of Hare. The *worst* result, according to the Coombs' method, is defined by the *level of rejections* that a candidate and his manifesto accumulate. It uses a completely different philosophy to that which is prevalent in current electoral systems. Contrary to the Hare method, the operating criterion is no longer the level of support, but the level of rejection. Concretely, during the first repetition, the candidate with the highest number of ballot papers where he/she is either not ranked or ranked in last position (the twelfth position in this case at the time of the first repetition) is eliminated, and votes in his/her favor are transferred to the candidates ranking in second position on those ballot papers. If a candidate receives the majority of votes as a result of this transfer, they are elected. Otherwise, a new repetition takes place, and the candidate who has the highest number of ballot papers where he/she is either not ranked or ranked in last position (the eleventh position in this case) is eliminated, and this process is repeated until a majority winner is found. Concerning this procedure, one of its main

[10] On this point, we thank Paul R. Abramson for his input.

advantages is that it always leads to the Condorcet winner being elected, as long as the voters' preferences are unimodal, as shown by Grofman and Feld (2004).

Using this vote counting method, we radically change philosophy, as the criteria for eliminating a candidate is no longer the level of support, but the level of rejections level that a candidate and his manifesto accumulate. Concretely, during each repetition, the candidate who has the highest number of ballot papers where he/she is either not ranked or ranked in last position is eliminated.

According to this procedure, and therefore accepting the hypothesis of voters' sincerity,[11] the first candidate to be eliminated (cf. table 6) is no longer Schivardi, but Le Pen. Out of the 893 ballot papers, 549 voters did not rank him, or ranked him in 12th position. The order of elimination during the course of the repetitions is as follows: Schivardi, Nihous, de Villiers, Bové, Laguiller, Buffet, Voynet, Besancenot and Royal. With this method, the two finalists are Bayrou and Sarkozy. Indeed, even though Royal collected more support than Bayrou, 32% versus 27.45% respectively (cf. table 3 or table 7), she is eliminated because she received more rejections, with 452 ballot papers, compared to 395 for Sarkozy and 215 for Bayrou. The latter appears to be the most consensual candidate, in other words the candidate collecting the least number of rejections.

TABLE 6 – vote count according to the Coombs' method.

Candidate	Repetition (% of votes received)										
	1	2	3	4	5	6	7	8	9	10	11
	Number of ballots where the candidate was not ranked or ranked in last position.										
Besancenot	345	347	351	354	357	373	403	439	**517**	-	-
Buffet	390	395	400	401	407	425	**454**	-	-	-	-
Schivardi	507	**522**	-	-	-	-	-	-	-	-	-
Bayrou	151	151	151	152	153	154	154	156	164	215	
Bové	430	441	455	468	**490**	-	-	-	-	-	-
Voynet	385	385	388	394	407	423	446	**474**	-	-	-
De Villiers	416	471	479	**486**	-	-	-	-	-	-	-
Royal	232	235	235	237	242	245	252	260	279	**452**	-
Nihous	471	482	**490**	-	-	-	-	-	-	-	-
Le Pen	**549**	-	-	-	-	-	-	-	-	-	-
Laguiller	430	445	448	454	468	**494**	-	-	-	-	-
Sarkozy	221	265	266	268	303	309	311	314	337	395	-

Table 7 shows the percentages of votes received by each candidate over the duration of the repetitions. With this method, the two finalists are Bayrou and Sarkozy. In this configuration, it is Bayrou who is elected with 51.97% of the votes, against 48.08% for Sarkozy.

The choice between vote counting methods, the Hare method *versus* the Coombs' method, therefore appears to be pivotal in deciding which candidate is elected. In our experiment, the Hare method leads to a final run-off between Sarkozy and Royal, with the former being the winner, but the Coombs' method brings about a final confrontation between Sarkozy and Bayrou, with the latter being elected as the winner.

[11] Testing the sincerity of voters in our sample is impossible in reality; our experiment takes place in the field, and not in a laboratory (in which case the initial allocations as well as participants' profiles can be defined, allowing one to measure the difference between their behavior and their "real" preferences).

TABLE 7 – vote count according to the Coombs' method – continued.

Candidate	Repetition (% of votes received)										
	1	2	3	4	5	6	7	8	9	10	11
	Votes received as % of all votes cast.										
Besancenot	6.49	7.62	7.74	7.85	7.96	8.53	9.89	11.39	**12.42**	-	-
Buffet	2.13	2.13	2.13	2.24	2.24	2.24	**2.81**	-	-	-	-
Schivardi	0.11	**0.11**	-	-	-	-	-	-	-	-	-
Bayrou	21.16	21.41	21.41	21.52	21.86	22.22	22.70	22.77	23.25	27.45	**51.97**
Bové	1.68	1.68	1.68		**1.68**	-	-	-	-	-	-
Voynet	2.02	2.02	2.02	2.02	2.02	2.24	2.36	**2.59**	-	-	-
De Villiers	1.90	2.13	2.13	**2.13**	-	-	-	-	-	-	-
Royal	22.28	22.76	22.76	22.87	22.87	23.12	23.37	24.24	25.17	**32**	-
Nihous	0.45	0.56	**0.56**	-	-	-	-	-	-	-	-
Le Pen	**6.72**	-	-	-	-	-	-	-	-	-	-
Laguiller	2.24	2.58	2.58	2.58	2.8	**3.14**	-	-	-	-	-
Sarkozy	32.81	37	37	37.11	38.45	38.5	38.88	39.01	39.16	40.55	**48.03**

This result shows that this method favors consensual candidates in the vote counting process, the one that collects the least rejections. Also, if we look at the results in the first column of table 6, we can see that the three candidates for whom the level of rejections (in the same sense as previously) is lowest for Bayrou (151 ballots), Sarkozy (221 ballots), and Royal (232 ballots). During the last but one repetition (the tenth), these are the exact candidates that remain on the list. The vast majority of Sarkozy's supporters ranked Royal after Bayrou, and similarly Bayrou's supporters ranked Royal after Sarkozy, although in a smaller proportion, and it is therefore Royal who attracted the most rejections, and is eliminated according to this method. This result gives us an initial indication concerning the existence of an eventual Condorcet winner. If one exists, it cannot be Sarkozy, because he loses in a direct run-off against Bayrou, as indicated by the result obtained through the Coombs' method.

5. Does the Hare method respect the Condorcet principle?

Our analysis of the different procedures of the single transferable vote forms part of a debate on the choice of a voting system with satisfactory qualities, which goes back as far as the eighteenth century and the rivalry between Condorcet and Borda.[12] The existence of Condorcet cycles prohibits the construction of a general procedure that, beginning with run-offs between candidates, would allow a relationship of collective preferences to be formed. Indeed, whenever a Condorcet cycle is present, the relationship formed by run-offs is no longer transitive.

If the candidates cannot be ordered based on the results of run-offs, which

[12] We find an introduction to this debate in Truchon (1999). For a more general view, see Diamantopoulos (2004).

candidate should be chosen? The answer proposed by Condorcet is a partial response: If at the very least one candidate exists, winning run-offs against each of the other candidates and is thus the Condorcet winner, he/she must be chosen. Consequentially, following Condorcet, many Social Choice Theorists consider a satisfactory voting system to be one, which identifies the Condorcet winner, as long as one exists.[13]

In this context, it is interesting to examine if there are Condorcet cycles in the votes that are studied here. The specific practical details of the transferable vote allow us to analyze the potential presence of a Condorcet winner, and to see whether or not the Condorcet winner is identified via one of the two transferable vote procedures.[14] If there is no cycle, the candidates can be ranked based on the results of run-offs against one other. We can therefore compare the ranking orders produced by each of the two vote counting methods.

To this end, we have reconstructed the results of each run-off using the ranking order expressed on each ballot paper. More precisely, for any given ballot paper, we consider that the voter elects for candidate A in a run-off with candidate B if candidate A is ranked ahead of candidate B, or if candidate A is ranked and candidate B is not. We find the results of all the run-offs in the (symmetric) matrix of associated vote (table 8).

Upon reading table 8, we can see that there are no Condorcet cycles which allow us to rank all of the candidates based on bilateral run-offs. Bayrou is the highest ranked, making him the Condorcet winner. He wins each of his 11 run-offs. Sarkozy comes next, winning 10 of his 11 run-offs (losing to Bayrou) followed by Royal, who is preferred in 9 out of 11 run-offs (losing to Bayrou and Sarkozy). In fourth place is Besancenot with 8 victories (he loses against the three previous candidates), confirming his good performance under the counting process of the single transferable vote, as he finds himself in the final four using both the Hare and the Coombs' methods. On the other hand, Schivardi loses all of his run-offs, and Le Pen wins only the run-off against Schivardi.

All together, the ranking of candidates using table 8 runs as follows:

Bayrou ≻ Sarkozy ≻ Royal ≻ Besancenot ≻ Buffet ≻ Voynet ≻ Laguiller ≻ de Villiers ≻ Bové ≻ Nihous ≻ Le Pen ≻ Schivardi

We can compare this to the ranking orders that use successive eliminations, produced using each of the two vote counting methods. The reverse order of eliminations using the Coombs' method is as follows:

Bayrou ≻ Sarkozy ≻ Royal ≻ Besancenot ≻ Voynet ≻ Buffet ≻ Laguiller ≻ Bové ≻ de Villiers ≻ Nihous ≻ Schivardi ≻ Le Pen

This order is very similar to that based on the ranking of candidates using run-offs. The Coombs' method successfully allows the election of the Condorcet winner, and beyond this, it ranks the first four candidates in the same order (Bayrou, Sarkozy, Royal and Besancenot). There are three instances where differences between the two ranks occur, where consecutive candidates swap positions: between Buffet and Voynet, between de Villiers and Bové and, at the bottom of the list, between Le Pen and Schivardi. However, we see far greater differences in the reverse order of

[13] See also Grofman and Feld (2004).

[14] As noted above, the theory gives a partial response to the question of whether the Coombs' method allows the Condorcet winner to be identified when preferences are unimodal (Grofman and Feld, 2004). However, we can easily show that the preferences expressed in our sample are not compatible with unimodality.

eliminations expressed by the Hare method:

Sarkozy ≻ Royal ≻ Bayrou ≻ Besancenot ≻ Le Pen ≻ Buffet ≻ Laguiller ≻ Voynet ≻ de Villiers ≻ Bové ≻ Nihous ≻ Schivardi

Indeed, we now require 9 swaps between consecutive candidates to pass from one list to the other, with two major changes. The first concerns Condorcet winner Bayrou's ranking in only third position according to the Hare method, behind Sarkozy and Royal. As a result of this, the Hare method does not respect the Condorcet principle. The second major difference is based on the ranking position of Le Pen. Despite losing all bilateral run-offs, apart from one against Schivardi, Le Pen is ranked in fifth position according to the Hare method, just behind Besancenot.

Consequentially, if the Coombs' method appears largely compatible with preferences using bilateral votes, based on this experiment, this is not the case with the Hare method.

6. Conclusion

A "good" electoral system must be simple, select the Condorcet winner (if one exists), and should limit the possibility to manipulate as much as possible (through insincere voting). Based on the preferences of voters taking part in this experiment, we have shown that the single transferable vote can lead to differing results, depending on the vote counting method that is used. With the Hare method, based on the capacity to unite support to eliminate candidates, the winner is Sarkozy (opposed in a final run-off by Royal). However the Coombs' method, based on the rejection level, gives victory to Bayrou (opposed by Sarkozy at the end of the process).

Whichever vote counting method is proposed, the practical details of the system remain the same, and our experiment showed that they do not form an insurmountable barrier for the voters. The single transferable vote is therefore considered to be a relatively simple electoral process. However, regarding the Condorcet principle, only the Coombs' method, and its profile for identifying voters' preferences, led to the Condorcet winner being elected, namely Bayrou. As for the Hare Method, the winner was deemed to be Sarkozy, who was equally the candidate to be elected by the two districts involved in the experiment in the two-round electoral system. Moreover, in this experiment, the use of the run-off results between candidates enables us to construct a system to rank candidates, which is much closer to the results of the Coombs' method than that of the Hare method.

In this article, we have shown that the single transferable vote (STV) responds well to the simplicity criteria, and it can identify the Condorcet winner, if one exists, as long as the adopted counting method is that recommended by Coombs (1964).

Amongst the research paths, which we intend to explore, is to test the hypothesis of non-monotonicity and unimodality of preferences which could, at least in theory, affect an electoral system's qualities (cf. Laslier, 2004). Our topic in this article was not to support or condemn the current electoral system, but more modestly to contribute to the Marquis of Condorcet's recommendation in his *Mémoires sur l'instruction publique*, according to which: "The more a population is enlightened, the more difficult its votes are to surprise."

TABLE 8 – Voting matrix – run-offs (candidate in column vs. candidate in line)

in % of cast (run-offs won by candidate in column shown in bold)

	Besancenot	**Buffet**	**Schivardi**	**Bayrou**	**Bové**	**Voynet**	**de Villiers**	**Royal**	**Nihous**	**Le Pen**	**Laguiller**	**Sarkozy**
Besancenot	-											
Buffet	**62.8/37.2**	-										
Schivardi	**86.4/13.6**	**78/22**	-									
Bayrou	25.3/74.7	18.6/81.4	8.6/91.4	-								
Bové	**74/26**	**64.2/35.8**	31.9/68.1	**82.8/17.2**	-							
Voynet	**60.2/39.8**	**50.1/49.9**	23.2/76.8	**83.1/16.9**	37.9/62.1	-						
De Villiers	**63.4/36.6**	**55/45**	39.1/60.9	**83.8/16.2**	49.1/50.9	**55.6/44.4**						
Royal	28.6/71.4	21.7/78.3	12.5/87.5	**60.1/39.9**	20/80	23/77	28.3/71.7					
Nihous	**76.4/23.6**	**68.4/31.6**	41.7/58.3	**88.6/11.4**	**61.6/38.4**	**70.2/29.8**	**59.7/40.3**	**82/18**				
Le Pen	**62.1/37.9**	**56.6/43.4**	47.1/52.9	**79.9/20.1**	**52.2/47.8**	**56.4/43.6**	**59.3/40.7**	**72.9/27.1**	**50.2/49.8**			
Laguiller	**69.1/30.9**	**58/42**	28.3/71.7	**81.6/18.4**	44.5/55.5	**53.1/46.9**	47.9/52.1	**80.3/19.7**	37.9/62.1	45.7/54.3		
Sarkozy	35.3/64.7	29.3/70.7	18.9/81.1	**52/48**	27.5/72.5	29.2/70.8	17.2/82.8	45.9/54.1	21/79	16.6/83.4	28.4/71.6	
Run-offs won:	**8**	**7**	**0**	**11**	**3**	**6**	**4**	**9**	**2**	**1**	**5**	**10**

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A The Ballot Paper

O. Besancenot	
M. G. Buffet	
G. Schivardi	
F. Bayrou	
J. Bové	
D. Voynet	
P. de Villiers	
S. Royal	
F. Nihous	
J. M. Le Pen	
A. Laguiller	
N. Sarkozy	

Rules of the single transferable vote: the voter ranks candidates in order: write 1 in the box next to the name of the candidate that you prefer; write 2 in the box next to the name of the candidate to whom you would like your vote to be transferred, should your first choice be eliminated; write 3 in the box next to the name of the candidate to whom you would like your vote to be transferred, should your first and second choices be eliminated, etc…

B Official national results and aggregated results of districts 1 and 6

	National Results				Local Results					
	First Round		Second Round		First Round			Second Round		
	Number	% turnout	Number	% turnout	Number	% turnout	% difference between local and national results	Number	% turnout	% difference between local and national results
Registered	44472834		44472733		2016			2016		
Votes cast	37254242	83.77	37342004	83.97	1592	78.97	-4.80	1621	80.41	-3.56
	Number	**% of votes**	**Number**	**% of votes**	**Number**	**% of votes**		**Number**	**% of votes**	
Blank/Spoilt	534846	1.44	1568426	4.2	24	1.51	0.07	68	4.19	-0.01
Counted	36719396	98.56	35773578	95.8	1568	98.49	-0.07	1553	95.81	+0.01
	Votes	**% of votes cast**	**Votes**	**% of votes cast**	**Votes**	**% of votes cast**		**Votes**	**% of votes cast**	
Besancenot	1498581	4.08			58	3.70	-0.38			
Buffet	707268	1.93			38	2.42	0.50			
Schivardi	123540	0.34			4	0.26	-0.08			
Bayrou	6820119	18.57			309	19.71	1.13			
Bove	483008	1.32			14	0.89	-0.42			
Voynet	576666	1.57			22	1.4	-0.17			
De Villiers	818407	2.23			37	2.36	0.13			
Royal	9500112	25.87	16790440	46.94	400	25.51	-0.36	724	46.62	-0.32
Nihous	420645	1.15			7	0.45	-0.7			
Le Pen	3834530	10.44			189	12.05	1.61			
Laguiller	487857	1.33			24	1.53	0.20			
Sarkozy	11448663	31.18	18983138	53.06	466	29.72	-1.46	829	53.38	+0.32

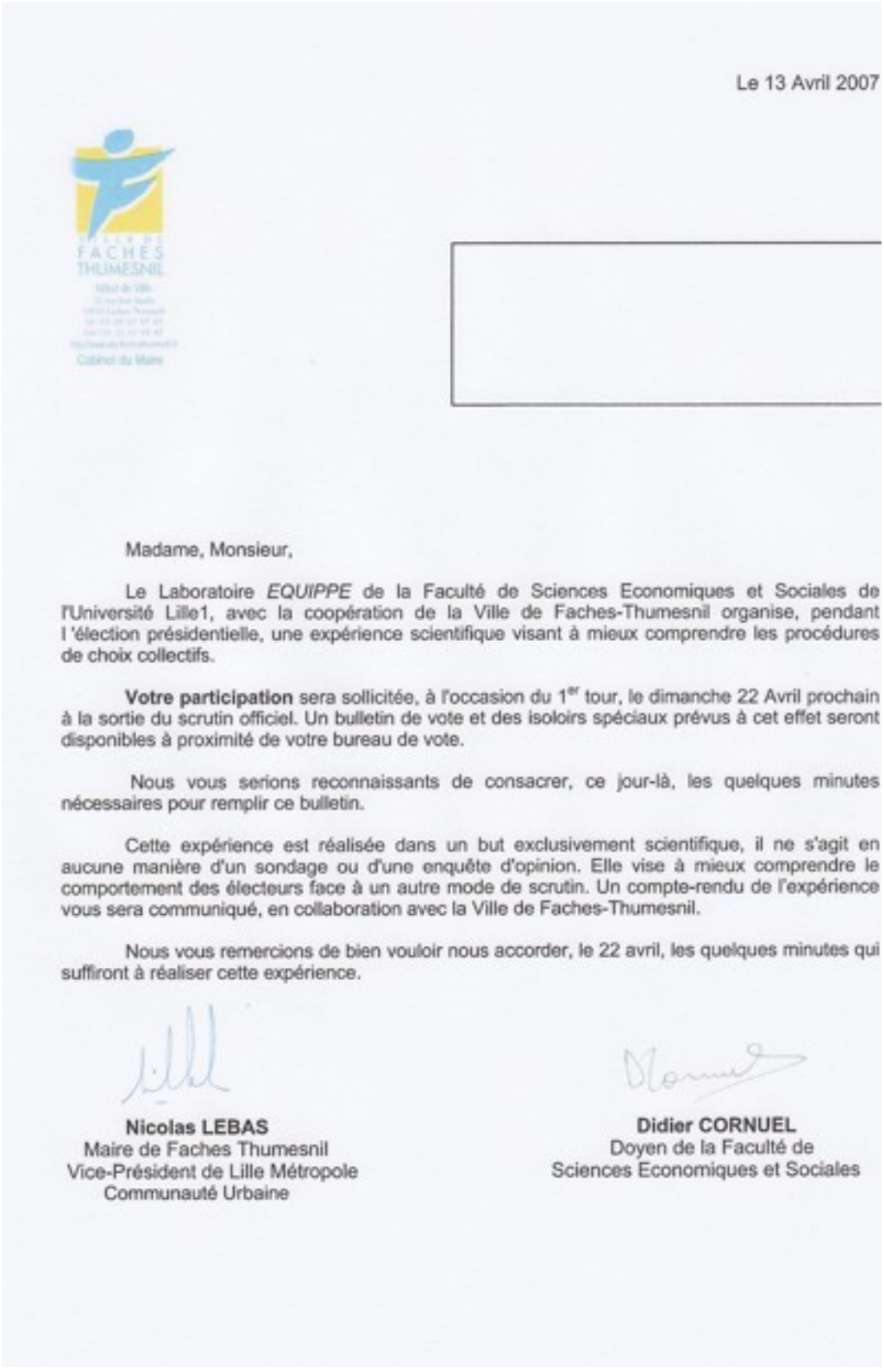
C The single transferable vote: an example of vote transfer during the course of the vote counting process

We include an example of one ballot paper, which ranked all 12 candidates, highlighting the procedure in which votes are transferred during each repetition in the elimination process, in this case using the Hare method. Using this method, the candidates were eliminated in the following order: Schivardi, Nihous, Bové, de Villiers, Voynet, Laguiller, Buffet, Le Pen, Besancenot and Bayrou.

	Repetition										
	1	2	3	4	5	6	7	8	9	10	11
Besancenot	2	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	-	-
Buffet	5	4	4	4	3	3	3	-	-	-	-
Schivardi	**1**	-	-	-	-	-	-	-	-	-	-
Bayrou	7	6	6	5	4	4	4	3	2	**1**	-
Bové	6	5	5	-	-	-	-	-	-	-	-
Voynet	11	10	9	8	7	-	-	-	-	-	-
De Villiers	4	3	3	3	-	-	-	-	-	-	-
Royal	12	11	10	9	8	7	6	5	4	3	2
Nihous	8	7	-	-	-	-	-	-	-	-	-
Le Pen	3	2	2	2	2	2	2	2	-	-	-
Laguiller	9	8	7	6	5	5	-	-	-	-	-
Sarkozy	10	9	8	7	6	6	5	4	3	2	**1**

The ranking presented in the first repetition corresponds to the rank that this voter recorded on his ballot paper. The following columns show how this ranking is modified as each candidate is eliminated, and therefore how his vote (rank number 1) is transferred from one candidate to another during the voting process.

D Letter sent to voters



Le 13 Avril 2007

Madame, Monsieur,

Le Laboratoire *EQUIPPE* de la Faculté de Sciences Economiques et Sociales de l'Université Lille1, avec la coopération de la Ville de Faches-Thumesnil organise, pendant l 'élection présidentielle, une expérience scientifique visant à mieux comprendre les procédures de choix collectifs.

Votre participation sera sollicitée, à l'occasion du 1er tour, le dimanche 22 Avril prochain à la sortie du scrutin officiel. Un bulletin de vote et des isoloirs spéciaux prévus à cet effet seront disponibles à proximité de votre bureau de vote.

Nous vous serions reconnaissants de consacrer, ce jour-là, les quelques minutes nécessaires pour remplir ce bulletin.

Cette expérience est réalisée dans un but exclusivement scientifique, il ne s'agit en aucune manière d'un sondage ou d'une enquête d'opinion. Elle vise à mieux comprendre le comportement des électeurs face à un autre mode de scrutin. Un compte-rendu de l'expérience vous sera communiqué, en collaboration avec la Ville de Faches-Thumesnil.

Nous vous remercions de bien vouloir nous accorder, le 22 avril, les quelques minutes qui suffiront à réaliser cette expérience.

Nicolas LEBAS
Maire de Faches Thumesnil
Vice-Président de Lille Métropole
Communauté Urbaine

Didier CORNUEL
Doyen de la Faculté de
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FACULTÉ DES SCIENCES ÉCONOMIQUES ET SOCIALES

La liberté d'apprendre, la volonté de comprendre, la faculté d'entreprendre

NOTE EXPLICATIVE

Un mode de scrutin n'est qu'une règle parmi beaucoup, qui toutes ont pour objectif de choisir le candidat réellement voulu par l'électorat. Chaque mode de scrutin a ses avantages et inconvénients. Le scrutin uninominal majoritaire à deux tours a le double avantage d'être facilement compréhensible par l'électeur et de conduire à une procédure de dépouillement très simple. Par contre il peut conduire à des comportements qui ne se traduisent pas par un « vote sincère », le plus connu étant le « vote utile ».

L'objectif de notre expérience scientifique est de tester un autre mode de scrutin qui est le « **vote préférentiel transférable** ». Avec cette procédure, les électeurs sont simplement appelés à **classer**, en les ordonnant, les candidats selon leurs **préférences** . Les électeurs ne sont pas obligés de classer tous les candidats en ordre de préférence; s'ils le désirent, ils peuvent en ordonner seulement un, deux, trois .... Comme ils peuvent choisir de classer du premier au dernier tous les candidats en lice. Lorsqu'ils ont classé plusieurs candidats dans leur bulletin, leur vote est transférable selon la procédure suivante : supposons un bulletin qui pour les 12 candidats en lice à cette présidentielle n'en a classé que 3 (candidat A en n°1, candidat B en n°2 et candidat C en n°3). Si le candidat A a reçu le moins de suffrage (dans les premières intentions de vote (en n°1)), il est éliminé et tous les électeurs qui avaient classé le candidat A en n°1, voient leur vote transféré sur leur deuxième choix (si il y en a un). En l'occurrence, dans notre exemple, sur le candidat B. Cette procédure est réitérée jusqu'à ce qu'un candidat ait obtenu la majorité absolue.

Le vote préférentiel transférable a un certain nombre d'avantages : il ne nécessite qu'un tour et surtout il permet de réconcilier le vote sincère (1er choix) avec le vote utile (2ème choix ou suivant). Mais comme toute procédure de décisions collectives, il possède également certains désavantages, en particulier la complexité du dépouillement.

Nous vous demanderons de remplir un tel bulletin en ordonnant les candidats : inscrire **1** dans la case située en face du candidat qui a votre préférence, inscrire **2** dans la case en face du candidat pour lequel vous souhaitez transférer votre vote si votre numéro 1 a été éliminé, inscrire **3** dans la case en face du candidat pour lequel vous souhaitez transférer votre vote si vos candidats 1 et 2 ont été éliminés, etc....

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