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Notes and Comments

A General Model of Tactical and Inverse Tactical Voting

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'Tactical voting' refers to voting contrary to one's nominal preferences. The usual form of tactical voting described in the literature consists of 'third' party supporters in plurality electoral settings voting for one of the two major parties in their constituency. This Note aims to demonstrate both theoretically and empirically the existence of the converse phenomenon, i.e. followers of one of the two big parties voting for a small one. We shall call this phenomenon 'inverse tactical voting' (ITV).

We shall develop a voting model which will help us to identify the reasons for ITV, its variation with the size of a constituency and the anticipated electoral results. The model will show that tactical voting is a highly aggregated phenomenon, since it expresses the net outcome of all possible flows of votes. Therefore, the only way to study tactical voting empirically is by focusing on individuals (surveys) and not through aggregate data.

DIFFERENT TRADITIONS IN THE LITERATURE

There are four bodies of literature directly or indirectly relevant to the problem of tactical voting:

1. *Duverger's law.*[1] The law states that plurality electoral systems favour two-party systems, because electors, understanding that small parties get under-represented, do not 'waste' their vote on them.[2] Leys has argued that conclusions about the party system of a country cannot be made on the basis of this law, because the law operates at the *constituency* and not at the national level.[3] Leys' remark indicates that there might be a flow of votes from a (nationally) major to a (nationally) minor party,

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[1] See M. Duverger, *Political Parties* (New York: Wiley, 1963; French original, 1952).

[2] In W. H. Riker's 'The Two-Party System and Duverger's Law', *American Political Science Review*, LXXVI (1982), 753–66, the law is traced back to 1869. The law has also been criticized by A. Wildavsky, 'A Methodological Critique of Duverger's *Political Parties*', *Journal of Politics*, XXI (1959), 303–18 and disputed by D. W. Rae, *The Political Consequences of Electoral Laws* (New Haven, Conn.: Yale University Press, 1971).

[3] See C. Leys, 'Models, Theories and the Theory of Political Parties', *Political Studies*, VII (1959), 127–46.

if the major party is expected to be third in the constituency.[4] However, the fundamental proposition that tactical voting shifts votes from small parties to big ones, at least at the constituency level, is the common denominator of this literature.

2. *Empirical tests of the law.* Several studies in the United States, the United Kingdom and Canada[5] indicate that the vote share of the third party decreases with the closeness of the race between the two major parties. They also show that people actually engage in tactical voting, and that the flow of votes is (as Duverger expected) from the small 'third' parties to the major ones.

3. *Social choice literature.* After Arrow's seminal 'Impossibility Theorem'[6] it has been proved that every electoral rule is manipulable, and can therefore lead voters to misrepresent their preferences, which in our terminology means to vote tactically. This view considers that any direction of flow is possible and that tactical voting is 'an inherent feature of voting methods'.[7]

4. *The 'non-voting paradox' literature.* This literature claims that if people vote for instrumental reasons (as Duverger or Downs suggest) they have no reason to vote at all, since the probability of an individual voter influencing the final outcome is infinitessimally small. There have been several attempts to explain this 'paradox'.[8] To the extent, however, that these solutions satisfactorily explain voting, they provide arguments against tactical voting. The reason is that tactical voting assumes some kind of expected utility calculation (one sacrifices one's first choice because its chances are slim and one cannot help it with one's vote). But such calculations indicate at the same time that one's personal chances of influencing any electoral outcome are also infinitessimally small.[9] Regardless of whether it is done in an explicit or an implicit

[4] Ivor Crewe pointed out to me that in the 1983 election in the United Kingdom the informed press was full of discussions about Labour or Conservative votes flowing to the Alliance in the constituencies where the latter was expected to be the second party.

[5] See R. F. Bensel and E. Sanders, 'The Effect of Electoral Rules on Voting Behavior: The Electoral College and Shift Voting', *Public Choice*, XXXIV (1979), 69–85. Also, see J. H. Black, 'The Multicandidate Calculus of Voting: Applications to Canadian Elections', *American Journal of Political Science*, XXII (1978), 609–38; B. E. Cain, 'Strategic Voting in Britain', *American Journal of Political Science*, XXII (1978), 639–55.

[6] K. S. Arrow, *Social Choice and Individual Values* (New Haven, Conn.: Yale University Press, 1951).

[7] W. H. Riker, *Liberalism Against Populism* (London: W. H. Freeman, 1982), p. 141. For the proof, see A. Gibbard, 'Manipulation of Voting Schemes: A General Result', *Econometrica*, XLI (1973), 587–601.

[8] An expected utility approach was proposed by W. H. Riker and P. C. Ordeshook, 'A Theory of the Calculus of Voting', *American Political Science Review*, LXII (1968), 25–42; a Minimax Regret approach by J. A. Ferejohn and M. P. Fiorina, 'The Paradox of Non-Voting: A Decision Theoretic Analysis', *American Political Science Review*, LXVIII (1974), 525–36; and a game-theoretical approach by T. Palfrey and H. Rosenthal, 'Voter Participation and Strategic Uncertainty', *American Political Science Review*, LXXIX (1985), 62–78.

[9] The point was made forcefully by P. H. Meehl. He claimed that 'the point is that the "thrown-away-vote" argument, as generally employed in American politics, presupposes that there is such a thing as not throwing away a vote.' (See P. H. Meehl, 'The Selfish Voter Paradox and the Thrown-Away-Vote Argument', *American Political Science Review*, LXXI (1977), p. 30.) On a different theoretical basis the same point is made by Ferejohn and Fiorina in 'The Paradox of Non-Voting' (p. 534), where they claim that 'voting for one's second choice is never MMR optimal'. Ferejohn and Fiorina, 'Closeness Counts Only in Horseshoes and Dancing', *American*

way, and whether the tone is descriptive or normative, the 'non-voting paradox' literature contradicts a theory of tactical voting.

Thus, two out of the four bodies of literature speak about a unidirectional flow of voters from small parties to major ones (tactical voting), one speaks about the theoretical possibilities of both tactical and inverse tactical voting, and one excludes it on analytical, empirical or normative grounds. Some further investigations and explanations would appear to be needed. Moreover, most of the theoretical work focuses on a two-party system, but the criteria of generality and parsimony 'imply that the same theories must be evaluated in different systemic settings and that social science theories can gain confirmation only if theories formulated in terms of common factors constitute the point of departure of comparative research'.[10]

We shall propose a voting model which, under certain specified conditions, permits for abstention, tactical and inverse tactical voting. We shall also indicate a case where inverse tactical voting is likely to have occurred.

THE VOTING RULE

For a two-party case, let us assume that prior to the election each individual elector has an expected outcome. If this expected outcome is 'sufficiently close' to a tie, then the individual is mobilized to vote, because his or her most preferred party might lose the election: the outcome is unstable. Otherwise the individual abstains, because he or she can do nothing about the outcome: the outcome is stable. Call m the mobilization threshold of an individual, that is the maximum difference between the expected outcome and a tie for which the individual is willing to go and vote. One can expect m to be an increasing function of the individual's interest in politics, and a decreasing function of the precision of his forecast of the outcome.[11]

In the case of three-party competition, m becomes the radius of a circle centred on the expected outcome. For three parties, there are two different kinds of instability: (1) When the elector's first choice is involved (his party might win the election). In this case the individual votes for his party. (2) When the elector's first choice is not at stake (his party does not have any chance). In this case the elector votes in favour of his second choice (i.e. tactically).

A barycentric system of coordinates is used to represent the different outcomes. Each point inside or on the sides of the triangle ABC of Figure 1 represents a different electoral outcome.[12] The distances of M from each side represent the percentage of

Political Science Review, LXIX (1975), 920–5 also presented empirical evidence that the closeness of an election does not affect the calculations of voters. Finally, G. Owen and B. Grofman in 'To Vote or Not to Vote: The Paradox of Non-Voting', *Public Choice*, XLII (1984), 311–25, shifted from descriptive to normative grounds and advised people not to vote tactically: 'If you are going to bother to vote at all, then never allow yourself to be talked out of voting for the candidate of your choice.'

[10] A. Przeworski and H. Teune, *The Logic of Comparative Social Inquiry* (New York: Wiley, 1970), p. 22.

[11] See G. Tsebelis, 'Abstention and Strategic Voting', paper presented to the Public Choice Society, Phoenix, Arizona, 1984.

[12] In the case of two parties, the point lies on one side of the triangle. The results of this study, however, can easily be generalized by using the unit tetrahedron for four-party systems, the unit polyhedron with five vertices in a four-dimensional space for a five-party system, etc. But these complications are not necessary unless one considers that trade-offs of votes between more than two parties take place.

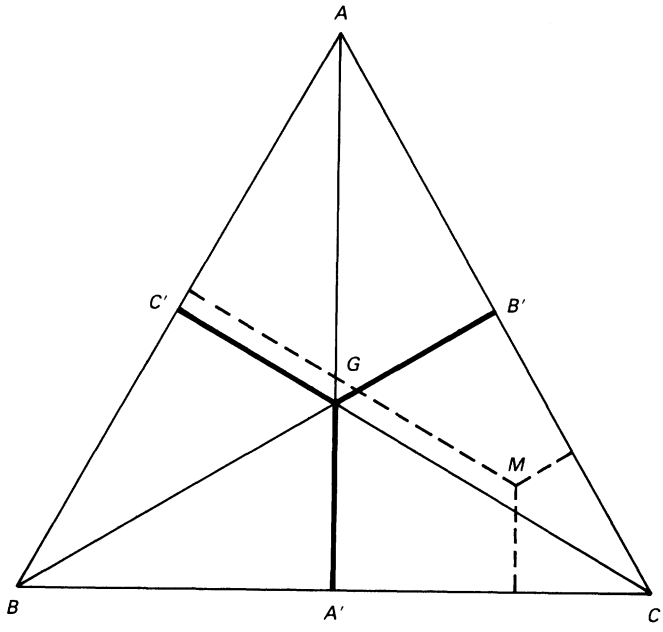

Fig. 1. The possible outcomes of a tri-party electoral competition

the corresponding party. Consequently, the closer M is to a vertex, the bigger the percentage of the corresponding party. (The point M in Figure 1 represents the following result: party $A = 20$ per cent, party $B = 15$ per cent, party $C = 65$ per cent.)

Figure 1 also demonstrates the different possible outcomes of a tri-party electoral competition: the centre of gravity G of the triangle represents a three-way tie between parties A, B and C. The segments $A'G$, $B'G$ and $C'G$ represent ties for first place between parties B and C, A and C, and A and B respectively. Segments AG, BG and CG also represent ties but for second place. The areas $A'BC'G$, $A'GB'C$, $AB'GC'$ (common boundaries excluded) represent the cases in which the party of the corresponding side of the triangle gathers a plurality of the votes.[13]

Let us use the decision rule we proposed to describe and understand the behaviour of two electors represented in Figure 2. Assume, without loss of generality, that both electors prefer party A to B and B to C. Each has an m of 5 per cent but the first forecasts that party A will get 75 per cent of the vote, party B 12 per cent and party C the remaining 13 per cent. Under this assumption he knows that his vote will not influence the final result and that there is therefore no reason for him to vote. By contrast, the second individual foresees the following result: 35 per cent for party A, 40 per cent for party B and 25 per cent for party C. He cannot exclude the possibility that his vote might influence the result and therefore he votes.

[13] For the student of British politics these barycentric coordinates are familiar from the work of W. L. Miller, *Electoral Dynamics in Britain Since 1918* (London: Macmillan, 1977), and I. Budge and D. Farlie, *Voting and Party Competition* (London: Wiley, 1977). Here I present a different use.

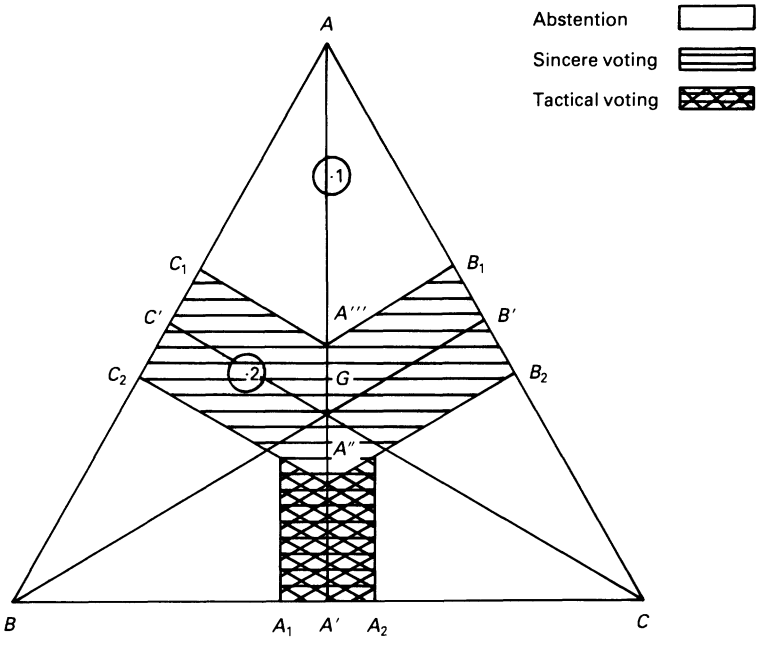

Fig. 2. Areas of abstention, sincere and tactical voting in a one-member constituency

The outcomes can now be divided into three different categories, as in Figure 2. If the expected outcome is in the neighbourhood of a first place tie between the elector's first choice and another party the elector will vote sincerely. The shaded area of Figure 2 represents all the expected outcomes for which the elector will vote sincerely. If the expected outcome is in the neighbourhood of a first place tie between his second and third preferences, the elector will vote tactically (heavily shaded area in Figure 2);[14] otherwise he will abstain.

From Figure 2 it can be seen that tactical voting is curvilinearly related to the mobilization threshold. When the latter is small, any increase extends the 'surface' of tactical voting; as m increases, however, the probability that the most preferred party is in an unstable situation also grows and thus the probability of sincere voting increases and the probability of tactical voting shrinks.

SINGLE-MEMBER VS. MULTI-MEMBER CONSTITUENCIES

The previous results hold for a single-member constituency regardless of the electoral law. For multi-member constituencies, however, one should specify whether voting occurs under a plurality or a proportional electoral system.

Let us consider the case of the plurality electoral system first. To simplify the matter, consider three candidates competing for a two-seat constituency under a plurality

[14] In the figure the width of the area of strategic voting is smaller than that of sincere voting. The reason is that I assume that a voter is less willing to break a tie between his second and third choice than to participate when his first choice is at stake.

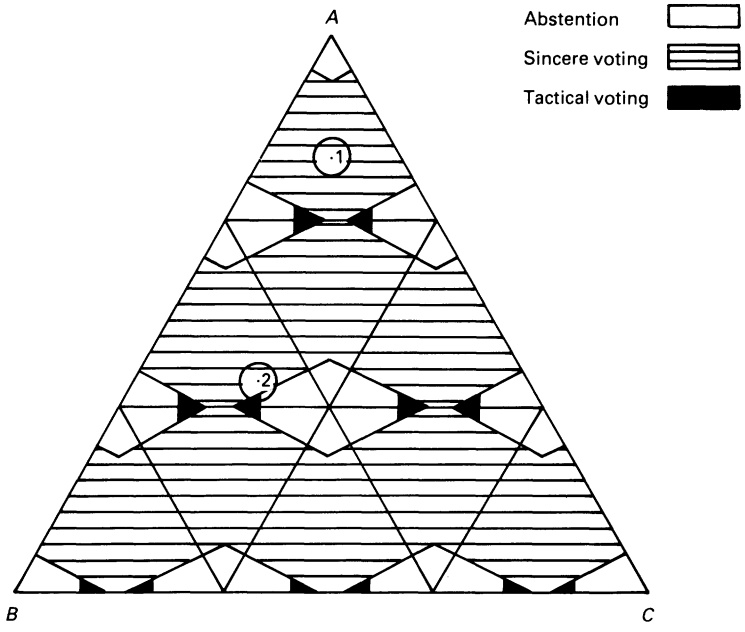

Fig. 3. Areas of abstention, sincere and tactical voting in a three-member constituency

electoral system. Most constituencies in England between the thirteenth and the nineteenth centuries serve as an example.

Consider the following situation: two Conservatives and one Liberal candidate compete in a two-member constituency. Each elector has the option of voting for either one or two candidates. Obviously, electors will vote for their most preferred candidate, and will not vote for their least preferred one. But will they also vote for their second choice? If the elector is a determined Conservative, he will vote for both of his party's candidates. But should a Liberal vote a straight ticket, or should he try to help the 'best' (to his mind) Conservative? Figure 1 can help us visualize the problem. Assume that vertex A represents the Liberal candidate, B the 'best' Conservative, and C the 'worst' Conservative candidate. If two candidates compete for first place (area around the segments GA', GB', GC') these two candidates will presumably get elected and therefore the question of whether or not to vote for the best Conservative does not matter. The same argument holds in the case of a second place tie between the Liberal and the worst Conservative (area around the segment GB). However, in the case of an expected second place tie between the two Conservatives (area around the segment GA) he should probably vote for his second choice, while in the case of an anticipated second place tie between the Liberal and the preferred Conservative (area around the segment GC), his vote would certainly be more effective if cast for the Liberal only. There is evidence that English electors in the nineteenth century made use of such reasoning.[15]

[15] See G. W. Cox, 'Strategic Electoral Choice in Multi-Member Districts: Approval Voting in Practice?', *American Journal of Political Science*, XXVIII (1984), 722–38.

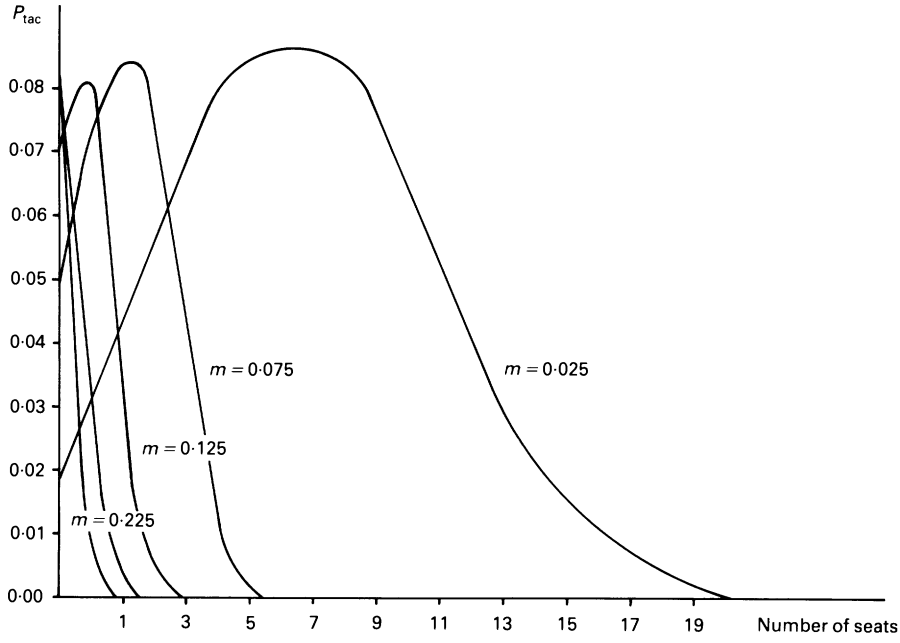

Fig. 4. Probability of tactical voting as a function of the number of seats of a constituency (n) *and the mobilization threshold* (m) of the electors.

Let us proceed by considering an n-member constituency in a proportional electoral system. To simplify matters, Figure 3 represents such a constituency for $n = 3$. Consider this three-member constituency and the two rational electors we described in Figure 2. Remember that the first elector abstained, because his estimate of the results was (75 per cent, 12 per cent, 13 per cent) and his mobilization threshold was 5; he therefore judged that he could do nothing about the outcome. This time, however, he faces the following situation. His party (A) will use 67 per cent of the votes to gain two seats. The third seat will be claimed by all three of the parties. Party A will have a remainder of 8 per cent, party B of 12 per cent, and party C of 13 per cent. Since the mobilization threshold m is 5, the elector realizes that his party needs help and will vote for it.

Suppose, however, that his mobilization threshold is 2. Voting for party A would be pointless. The elector would still vote but for party B (provided his utility from B is high enough). Figure 3 gives us an interesting insight into that situation. The area of sincere voting (shaded area) has increased dramatically. It is easy to see that in this case of a three-member constituency our elector is inside the area of sincere voting, while in the one-member constituency he was not (Figure 2). However, when the mobilization threshold is lower ($m = 2$), the elector might find himself either in the area of tactical voting (the dark area of Figure 3, assuming the utility from party B is high enough) or in the area of abstention (the unshaded area in Figure 3).

Thus the probability of sincere voting increases with the number of seats in the constituency. Moreover, as the mobilization threshold m increases, sincere voting becomes rapidly more certain. Conversely, the probability of abstention decreases with the number of seats and the height of the mobilization threshold.

Tactical voting presents more interesting properties. Figure 4 gives a graphic representation of the probability of tactical voting as a function of the number of seats in the constituency and of different values for the mobilization threshold. This is under the assumption of a uniform distribution of expectations over the outcome space (i.e. that any outcome is equally probable), an assumption that greatly simplifies the calculations.

Figure 4 demonstrates that the probability of tactical voting increases with the number of seats up to a certain maximum, but then declines. It is interesting to note the influence of m on this bell-shaped pattern. We have already shown that an increase in the number of seats (n) is roughly equivalent to an increase in m. This is again demonstrated in Figure 4. The curve of strategic voting becomes 'compressed' as m increases. For example, tactical voting reaches its peak in a seven-member constituency if $m = 0.025$, while it peaks in a two-member constituency if $m = 0.075$. Moreover, tactical voting disappears in a five-member constituency if $m = 0.075$, while it disappears in smaller constituencies (three-member) if $m = 0.125$. As a general rule, Figure 4 indicates that both the maximum of tactical voting and the point of disappearance occur earlier (in smaller constituencies) when m increases.

This figure assumes that the mobilization threshold remains constant, regardless of the number of seats. However, it is reasonable to assume that a multi-member constituency forms a more reliable base for forecasting the outcome. In this case, the margin of the error is reduced as a function of n, the forecast is more precise and the probability of abstention increases. However, as long as m is not considered to be inversely proportional to the number of seats, the reported results remain.

INVERSE TACTICAL VOTING

In the previous discussion no assumption was made about the size of the parties. However, all the empirical studies mentioned earlier concentrate on the transfer of votes *from the 'third party' to one of the big ones*. In the case of plurality electoral laws there is no difference between the results expected from this model and the ones reported in the literature. However, in the case of multi-member constituencies under proportional representation with allocation of seats according to the largest remainder the opposite phenomenon might occur: supporters of a big party might vote for a small one.

To illustrate this case, consider an elector who supports party A and expects the following results in a three-member constituency: party $A = 39$ per cent, party $B = 13$ per cent, and party $C = 48$ per cent, with $m = 5$. According to the elector's expectations parties A and C will gain one seat each, whereas the third seat is claimed by all three parties, with the following remainders: party $A = 6$ per cent, party $B = 13$ per cent, party $C = 15$ per cent. Under these circumstances, the elector realizes that there is no point in voting for his party.

The model we introduce concludes that this elector will *not* vote for his party (A) and will *not* vote for one of the two big parties (A and C) either. In fact, a vote for party A under these circumstances would be a 'wasted' vote. He will vote for the smallest party (B), which is *not* his first preference, provided his utility from the election of a deputy of party B is enough to make him vote at all.

This point recalls Leys' criticism of Duverger's law. There is, however, one important difference. The novel phenomenon that ITV demonstrates is that even when one keeps the analysis at the constituency level, under proportional representation (but

not under plurality systems) votes might flow from major parties (*in the constituency*) to smaller ones. The reason is that in the case of proportional representation what determines an elector's decision (given his expected outcome) is not the strength of parties in a constituency, but the remainder of votes after the first distribution of seats. ITV therefore pushes Leys' logic a step further (and a level of analysis lower) with respect to proportional electoral systems.

All these models keep the analysis at the local level. For a more accurate study of voting, however, one should include forces that operate at the national level. For example, given that Duverger's law operates locally (as Leys suggests) one would expect it to operate with more force if the 'third' party in a constituency is also 'third' nationally rather than one of the two major parties.[16] Similarly, in the case of ITV we expect people to be more willing to use it in favour of a nationally major than a nationally minor party.

We have already demonstrated that inverse tactical voting is possible. We are now going to argue that it is also empirically testable and observable. It has been demonstrated that in West German elections there is a big difference between the constituency (plurality) and the party list (proportional) vote for the Free Democratic party (FDP).[17] This difference has traditionally been explained as the action of FDP supporters voting in their constituency for one of the two big parties in order not to 'waste' their vote.[18] However, let us look at the last (1983) West German elections. Suppose that a Christian Democrat expects the following results: CDU–CSU, 47 per cent; FDP, 4 per cent; SPD, 43 per cent, Greens, 6 per cent. These results indicate that the FDP, which is allied with the CDU–CSU, might not pass the 5 per cent threshold which according to the West German law is necessary for representation in the Bundestag, and therefore the coalition might lose the election. With respect to his party list vote he is faced with the choice of either voting for his party (which according to the model above, he must do if m is more than 3 per cent), or of helping the FDP enter the Bundestag and form a coalition government. (According to the model, if his mobilization threshold is less than 3 per cent he will choose this second solution.) The same elector, regardless of this choice, knows quite well that there is no point in voting FDP with his constituency (plurality) vote.

The previous example indicates that ITV is not only a theoretical possibility, but could have occurred in actual political life. Further empirical investigation is needed to assert that West German electors did use this reasoning in 1983. We already know, however, that they were advised to do so by political elites. In fact, the FDP's electoral strategy was an attempt to get second votes from Christian Democrat supporters. This strategy was strongly opposed by the leader of the CSU, Franz-Joseph Strauss, but tolerated by the leadership of the CDU until the last moment, when the CDU's General Secretary, Geisster, warned the voters not to make experiments with their second vote (the party list vote). The authoritative *Frankfurter Allgemeine Zeitung* commented that this statement marks 'a clear change in the CDU's tactics, made

[16] On this point see also Riker, 'The Two Party System and Duverger's Law', p. 762.

[17] See S. L. Fisher, 'The Wasted Vote Thesis: West German Evidence', *Comparative Politics*, v (1973), 293–9.

[18] K. von Beyme, *The Political System of the Federal Republic of Germany* (New York: St Martin's, 1983), p. 30, is the exception. He claims that votes 'were borrowed for the FDP from the SPD to keep the coalition in power'. This is precisely the Inverse Tactical Voting thesis of this Note.

possible by Kohl's agreement *which had previously been denied*'[19] (emphasis added). It explained that 'Kohl's interest in the FDP's returning to the Bundestag stopped him from protesting too strongly against the FDP's tactics'.

CONCLUSIONS AND DISCUSSION

This model has two distinctive features. Firstly, it can deal with the full range of electoral systems and district magnitudes. According to our results abstention decreases with the number of seats in a constituency; conversely, sincere voting increases; finally, tactical voting presents a bell-shaped pattern, increasing with the number of seats at first but disappearing subsequently. Secondly, it emphasizes the importance of inverse tactical voting. Under certain conditions, supporters of a big party might vote for a small party. This discovery is important because it demonstrates that tactical voting does not exist only in plurality systems, but also in proportional systems. In the latter case, the flow of votes is not only from small parties to big parties, but also vice versa, as well as between big parties or between small parties. In fact, one can think of cases where any flow of votes is possible. This finding demonstrates that when aggregate data are used to identify tactical voting, what is in fact measured is the net effect of vote transfers. Put differently, *aggregate data can only measure the net result of tactical and inverse tactical voting*. 'Tactical voting' is therefore a highly aggregated phenomenon, being merely the visible part of a multitude of vote transfers from one party to the other, according to expectations of voters in different constituencies. Only survey research can show the individual-level forces underlying the aggregate result.

There are several promising directions that generalization from the model might take:

1. More restrictive assumptions about the distribution of forecasts. At this stage the model can only give us qualitative information. Such a generalization, however, could substantially increase the accuracy of the results, and even offer the possibility of estimations. One interesting problem that might be resolved is the degree by which close competition increases participation and tactical voting.

2. Incorporation into the model of differential characteristics of party followers. In the model m is considered as a function of the elector's accuracy of the prediction and interest in politics, without specifying the exact functional form. It seems likely that the various social strata differ systematically in these two characteristics, so that tactical voters are different kinds of people from abstainers. Moreover, the socio-economic characteristics of the supporters of different parties might make them more or less predisposed to abstention or tactical voting. In this case, the leadership of each party would have to generate the appropriate expectations with respect to the electoral outcome in order to maximize the number of its own supporters and minimize those of its opponents.

3. An extension of the model to different constituencies at the same time. The example of West German elections indicated that the utility of voting for a party is determined not only by local but by national considerations also. Consequently, utilities should be considered not as a simple expression of the tastes of voters, but as the joint effect of tastes and electoral institutions. Such an extension would provide further insight into electoral relations between big and small parties as well as into electoral and party systems.

[19] Issue of 2 March 1983.