

The Buhagiar Report

In June of 1994 the Maltese Government created a "Commission on the Electoral System" composed of one representative each from the three political parties, the PN, the MLP and the Alternattiva, under the chairmanship of the Speaker of the House. This Commission was appointed

"to draw up a report with proposals, suggestions and alternatives that could be implemented so that:--

(i) in respecting the principles which safeguard the citizens' democratic rights and the governability of the country, the electoral system will ensure that the number of seats of a political party Parliament is as much possible proportional to that party's first count vote; and

(ii) in improving the process and the electoral law, the related workings would be more transparent and at every stage enjoy the trust of all the citizens and of all the parties participating in the election; and possibly find means of how the final result of a general election could be announced earlier than it has been done so far."

When the Commission issued its report in November of 1994, it had agreed on recommendations to improve some procedural matters (such as speedier vote counting) but had not been able to achieve a consensus on questions relating to greater proportionality or the creation of a vote "threshold" for minor parties. The report of the Commission has never been officially published in the Government Gazette, although copies were made available to the Prime Minister, and (only on his insistence) to the Leader of the Opposition, as well as "limited photocopies" to the press. I have finally obtained one of those limited copies. It can be found [here](#).

One of the appendices to that Commission report was a paper by Professor Anton Buhagiar which the Commission had asked him to prepare. This contribution is reproduced below. It is a careful, comprehensive and lucid plan for a reform that would deal with the problem of disproportionality. It did not address, however, the question of "governability" and probably for that reason failed to receive the Commission's endorsement.

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CAN ONE ACHIEVE NATIONWIDE PROPORTIONAL REPRESENTATION IN MALTA WITHOUT MAJOR CHANGES TO THE PRESENT METHOD OF ELECTION?

by

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It is a well known fact that in the General Elections held in Malta in recent years, certain anomalous results can occur in the sense that the party with more than 50% of the first count votes ends up with less seats than another party which polled less than 50% of the first count votes. Such an outcome happened for example in the General Elections of 1981 and 1987. This anomaly can happen because when the Single Transferable Vote (STV) is used to elect candidates in the various constituencies, some votes are necessarily wasted, and are not used to elect any candidate. If the total of the votes wasted in the constituencies turn out to be below mostly to one political party, such a party will end up with less seats than it should, thus leading to the above mentioned anomaly. In 1987, Constitutional amendments were implemented to rectify such a phenomenon. Essentially, if a party gets more than 50% of the first count votes in an election, and fails to obtain a majority of seats from the constituencies, a number of candidates are co-opted so that the offended party will obtain a majority in the House of Representatives.

One might be tempted to devise a completely new electoral system to achieve a result which is fair to both the voters and to the political parties concerned. However, the Single Transferable Vote has been lauded by various authorities as being one of the fairest methods of election. Besides, the STV is very close to the hearts of the Maltese public - people are very eager to follow the fortunes of their favourite candidate through the numerous counts so typical of STV. The object of this study is therefore to start off with the Maltese Electoral System as implemented prior to 1987, and then to perform minor adjustments to this process in order to secure the highly desirable feature of *nationwide proportional representation*, i.e. that the total number of seats gained nationally by a party should reflect the total number of votes earned by it in the various constituencies, and this irrespective of the actual configuration of the constituency boundaries.

Several questions come to mind when one attempts to secure proportional representation on a national basis:

a) Is the nationwide total of first count votes cast for a given political party a fair indicator for the number of seats to be awarded nationwide to that party, or should one rather employ the final count vote to compute the required number of representatives for that party?

b) If the first count vote is chosen for the purpose mentioned in paragraph (a) above, how does one proceed to compute the actual number of seats to be assigned to a political party on a nationwide

basis?

c) How should the ideal number of seats assigned to a party nationwide be implemented? Should the STV be allowed to proceed exactly as at present, examine the final result, see whether it tallies with the ideal nationwide distribution, and hence affect changes, if any are required, to restore the STV to nationwide proportionality? Should any deviations of the STV from a proportional result be corrected *a posteriori*, i.e. after the actual election has taken place?

d) When the total number of seats to be allotted to each party on a nationwide basis has been determined, can one proceed to allocate *a priori* the seats of a given party district by district? Can this *a priori* distribution of party seats by district be made to guide the actual evolution of a subsequently held STV? (Please note the difference from paragraph c above). In particular, how can one distribute *a priori* a party's seats amongst the various constituencies, without changing the total number (65 at present) of seats in the House and without altering the regional representation of Parliament, i.e. that each constituency should return 5 members to the House?

To examine these various questions, we consider the seven elections held in Malta in the period 1962 to 1992. These were held in 1962, 1966, 1971, 1976, 1981, 1987, and 1992. A considerable range of conditions prevailed in these elections: there was a varying number of parties contesting, a variable number of minor parties, a variable quantity of transferred votes, a varying number of constituencies, and a varying total number of representatives. These elections therefore provide a good testing ground for any conjecture or theory one would like to make on Maltese elections.

DETERMINING THE NATIONWIDE NUMBER OF SEATS TO WHICH A PARTY IS ENTITLED.

Throughout this study we use the well known *d'Hondt divisor method* to convert a number of votes to a corresponding number of seats. The virtue of divisor methods is that they tend to equalise as far as possible the votes wasted for the various parties contesting a given election. (For the benefit of the reader, an example of how the divisor method works, is given in Appendix I at the end of this study).

In this section, we use the divisor method to predict the number of seats a party would win nationwide in the above mentioned elections, both on the basis of its first count vote and also on the basis of the final count vote. The results are then compared to the actual outcome of that particular election.

Relevant information on these elections are given for convenience in Table I. For each election between 1962 and 1992, we give the total first count vote for each party, the net number of votes transferred to that party, as well as the final count vote which is the sum of the first count vote plus the net votes transferred.

The number of representatives allotted nationwide to each party is then calculated on the basis of (i) the first count and (ii) the final count using the *d'Hondt divisor method*. The actual number of seats (iii) earned by each party in that election is also given. This information is also given in Table I.

For each election, we also give the discrepancy between the number of seats as calculated in each of (i) and (ii) using the divisor method, and the actual number of seats (iii) actually gained by a given party in that election. These are given in parenthesis is near

columns (i) and (ii) in Table I.

On examining Table I, one can notice the following important facts:

a) The number of seats estimated by the d'Hondt divisor method on the nationwide first count and on the final count (columns i and ii) are identical in the elections of 1971, 1981 and 1987. These were the elections where there were very few transfers. The discrepancies between each of the divisor methods (i) and (ii) and the actual election results (iii), shown in parenthesis in Table I, are therefore identical for these three elections.

b) There is a small discrepancy between the first count estimate of nationwide seats and the final count estimate in the elections of 1962, 1966, 1976 and 1992.

In 1976, the first count estimate agrees exactly with the outcome of the election, and is actually better than the final count estimate, which predicts one seat less for the MLP and one seat more for the PN than what is actually observed in the election.

In the elections of 1962, 1966 and 1992, when there was a considerable number of votes transferred between parties, the final count estimate is slightly better than the first count estimate.

In 1962, the first count estimate predicts three seats less for the PN and one seat more for each of MLP, CWP and PCP - a malassignment of 3 seats. The final count estimate is slightly nearer to the actual election outcome since it predicts 1 seat less for each of the PN and the DNP, and 1 seat more for each of the MLP and the CWP, - a reshuffle of 2 seats.

Similarly, in the election of 1966, the first count estimate predicts three seats less for the PN and three seats more for the CWP - a malassignment of 3 seats. The final count estimate is slightly nearer to the actual election outcome since it predicts 2 seats less for PN, and 2 seats more for CWP - a reshuffle of 2 seats.

c) In view of a) and b) above, the first count is practically as near to the actual election result as is the final count, and this seems to be true even when there is a considerable number of transfers. Besides, the first count is a more immediate quantity and is simpler to define, comprehend and calculate than is a later or final count. Many authors, while praising the STV for its superior proportionality vis-vis other methods, have described the higher counts of the STV system as rather unstable, and they actually give examples where a small number of changed preferences could profoundly affect which of the candidates are elected. The first count should therefore be preferred in general to a later or final count to maintain nationwide proportional representation.

5) The first count vote agrees exactly with the actual election result in the elections of 1971 and 1976. In all the other elections considered, a difference exists between the estimate of seats based on the nationwide first count and the actual election result. In the 1966 election say, the divisor estimate predicts 3 seats less for the PN and 3 seats more for the CWP than actually obtained in the election. Similarly, in the elections of 1981 and 1987, the divisor method on the first count predicts 2 seats less for the MLP, and 2 seats more for the PN. In 1992, the divisor method predicts one seat less for the MLP, and one seat more for AD. In all the elections held between 1962 and 1992, there never was a disparity of more than 3 seats between the first count divisor estimate and the actual election result.

TABLE I : Elections held in Malta between 1962 and 1992. Comparison of the number of seats obtained using the d'Hondt divisor method on i) the national total of first count votes, and ii) the national total of final count votes. These are compared to iii) the seats actually obtained in the given election. The discrepancies in the number of seats between method i), the first count estimate, and method iii), the actual number of seats obtained in the election, ie. (i)-(iii), are given in parenthesis next to the column representing i). The difference between the final count estimate ii) and the actual: number of seats iii) are also given in parenthesis next to column (ii). It is important to note that in all the elections between 1962 and 1992, the first count estimate is nearly as accurate as the final count estimate in predicting the final election result. Sometimes it is even better (as in 1976). The maximum assignment error for the first count estimate is 3 seats (in 1962 and 1966), whilst the maximum error for the final count estimate is 2 seats (also for the elections of 1962 and 1966). One can therefore conclude that the first count estimate reliably predicts the actual number of seats obtained in an election.

1962 ELECTION.

PARTY	1st count	Transfer to party	Final count	D'Hondt 1st count SEATS	d'Hondt final count SEATS	Actual Election; STV in 10 constit.
PN	63262	7442	70704	22 (-3)	24 (-1)	25
MLP	50974	24	50998	17 (+1)	17 (+1)	16
CWP	14285	-25	14260	5 (+1)	5 (+1)	4
DNP	13968	-3030	10938	4	3 (-1)	4
PCP	7290	-3719	3571	2 (+1)	1	1
DCP	699	-577	122	0	0	0
IND	128	-115	13	0	0	0
TOTAL	150606	0	150606	50	50	50

1966 ELECTION.

PARTY	1st count	Transfer to party	Final count	D'Hondt 1st count SEATS	d'Hondt final count SEATS	Actual Election; STV in 10 constit.
PN	68656	6013	74669	25 (-3)	26 (-2)	28
MLP	61774	340	62114	22	22	22
CWP	8594	-3055	5539	3 (+3)	2 (+2)	0
PCP	2086	-1494	592	0	0	0
DNP	1845	-1543	302	0	0	0
IND	392	-261	131	0	0	0
TOTAL	143347	0	143347	50	50	50

1971 ELECTION.

PARTY	1st count	Transfer to party	Final count	D'Hondt 1st count SEATS	d'Hondt final count SEATS	Actual Election; STV in 10 constit.
MLP	85448	297	85745	28	28	28
PN	80753	1321	82074	27	27	27
PCP	1756	-1530	226	0	0	0
OTHERS	102	-88	14	0	0	0
TOTAL	168059	0	168059	55	55	55

1976 ELECTION.

PARTY	1st count	Transfer to party	Final count	D'Hondt 1st count SEATS	d'Hondt final count SEATS	Actual Election; STV in 13 constit.
MLP	105854	-113	105741	34	33 (-1)	34
PN	99551	141	99692	31	32 (+1)	31
OTHERS	35	-28	7	0	0	0
TOTAL	205440	0	205440	65	65	65

1981 ELECTION.

PARTY	1st count	Transfer to party	Final count	D'Hondt 1st count SEATS	d'Hondt final count SEATS	Actual Election; STV in 13 constit.
MLP	109990	1	109991	32 (-2)	32 (-2)	34
PN	114134	16	114150	33 (+2)	33 (+2)	31
OTHERS	29	-17	12	0	0	0
TOTAL	224153	0	224153	65	65	65

1987 ELECTION.

PARTY	1st count	Transfer to party	Final count	D'Hondt 1st count SEATS	d'Hondt final count SEATS	Actual Election; STV in 13 constit.
MLP	114936	259	115195	32 (-2)	32 (-2)	34
PN	119721	43	119764	33 (+2)	33 (+2)	31
OTHERS	511	-302	209	0	0	0
TOTAL	235168	0	235168	65	65	65

1992 ELECTION.

PARTY	1st count	Transfer to party	Final count	D'Hondt 1st count SEATS	d'Hondt final count SEATS	Actual Election; STV in 13 constit.
PN	127932	1802	129734	32 (-2)	32 (-2)	34
MLP	114861	1535	116396	33 (+2)	33 (+2)	31
AD	4186	-3337	849	0	0	0
TOTAL	246979	0	246979	65	65	65

End of Table I

IMPORTANT FEATURES OF THE NATIONWIDE DISTRIBUTION OF SEATS.

The divisor method for nationwide proportional representation has some important properties:

i) If the number of available seats is odd, and two parties are contesting the election, the party with the larger number of votes will always get a larger number of seats, however minimal the difference. This is important in that a situation like the elections of 1981 or 1987 cannot arise where the party with the larger number of votes obtains a smaller number of seats.

ii) The result in i) can in fact be generalised. If there is any number of parties contesting the election, if the number of available seats is odd, and one party gets more votes than all the others put together, then that party will obtain more than 50% of the available seats. This is a very important majority rule satisfied by this procedure.

iii) The effect of a threshold, if any, is to ignore the relevant parties for the assignment of seats. Therefore, a party which has a majority of votes without the threshold will potentially have an even greater majority in the presence of a threshold when some parties are excluded. The results in i) and ii) therefore hold a *fortiori*.

iv) If the total number of available seats is even, rather than odd, an election result can be imagined where a party gets a majority of votes but gets an equal number of seats as the total number of seats gained by the other parties. For example, suppose in a three party election,

..
 Party A polled 32200 votes,
 Party B polled 32000 votes,
 Party C polled 100 votes.

If the total number of seats available is 64, then 32 seats will be allotted by the divisor method to each of A and B, and none to party C. This will result in a hung Parliament, even though A has an absolute majority of votes. For this reason it is better to have the total number of available seats to be odd, as it has in fact been for all elections in Malta since 1971, 55 at first and finally 65.

v) It is also easy to imagine an election contested say by three parties where party A gets more votes than party B, but less votes than the total of votes polled by parties B and C together. In this case it could happen that party A gets more seats than the total number of seats gained by B and C. This could happen when, say, party C just fails to win a single seat. An example can be

furnished by a result such as:

Party A polled 32001 votes,
Party B polled 32000 votes,
Party C polled 100 votes.

In this case, if 65 seats are to be distributed, A wins 33 seats, B wins 32 seats, and C fails to win a seat. So A wins more seats than B and C together although it polled less votes than B and C together. This the familiar problem of the divided vote.

vi) It is sometimes possible that the divisor method necessarily requires more seats than the total number of seats stipulated before the election. Take for instance the following example for a three party election with the following result:

Party A polled 33000 votes,
Party B polled 32000 votes,
Party C polled 1000 votes.

Assuming the total number of seats to be fixed beforehand to 65, the divisor method distributes the first 63 seats, 32 to A and 31 to B without any problem. When one tries to assign the 64'th seat by the divisor method, the next vote to seat ratio will be exactly equal to 1000 for all three parties. So then 3 further seats will have to be assigned, one each to A, B, and C. A will get 33, B 32 and C will get 1 seat. The total number of seats will then add up to 66 not 65! Fortunately the probability of such an event happening is very remote: the votes polled by the parties will have to be exactly in a very unlikely ratio! However should this actually happen, one might decide by law which party is to forfeit the seat.

The above properties are very important. In particular, the fairness of the nationwide distribution of seats towards the contesting parties can be deduced from the important result ii) mentioned in this section, as well as its corollaries i) and iii).

The features mentioned in this section can be vividly illustrated using the Monte Carlo method. An election, assumed for simplicity to be between three parties, is simulated by the computer, which assigns a random number of votes to each of the parties. The divisor estimate for seats won nationwide by each party is then calculated for that election. When this simulation is carried out many times, one can simulate the various combinations occurring in items I) to v) in this section. These results are indeed borne out by these simulations. Whenever party A has more votes than B and C together, it had the absolute majority of seats.

The phenomenon mentioned in vi) above is extremely rare and millions of such elections will have to be simulated to actually arrive at such an unusual voting pattern.

THE EFFECT OF A THRESHOLD.

In several electoral systems, parties have to gain at least a certain percentage (usually 5%) of the national first count votes to secure representation in Parliament. It is important therefore to gauge the effect of a hypothetical threshold on the nationwide distribution of seats. This is done in Appendix II.

Disclaimer: The purpose of this section is not to encourage the adoption or non-adoption of a threshold in Maltese elections, but to objectively determine the effect of a threshold on the calculations performed in this study.

A POSTERIORI RESTORATION OF AN STV TO NATIONWIDE PROPORTIONALITY.

Since it was found in Table I above that the result of the election as concluded at present is not more than 3 seats different from the first count divisor estimate, and since this estimate is morally preferable to the actual: outcome of such an election in case they are different, one should treat this outcome as provisional, and then try to adjust it to tally exactly with the nationwide first count estimate of seats. (A similar method was advocated by Mr M. C. Spiteri in a letter to The Sunday Times of 24th June 1984.)

If we take as an example the election of 1987, it is found that the first count estimate predicts 2 seats less for the MLP and 2 seats more for the PN than the number of seats actually obtained in the election. In this case it is clear that changing 2 seats from MLP to PN will restore the result to nationwide proportionality. This can be done by first identifying two constituencies where the PN has a relatively high percentage of votes and a relatively small percentage of seats (or vice versa for MLP). The difference of these two percentages in a given district can be termed the *under representation* of the PN in that district..

The details of such a transfer is illustrated in Table II. The first part of this table shows how to calculate the under representation of the PN in every district. In a similar way, one can calculate the under representation for each party in each district. Such an array of numbers can be termed the *under representation matrix* and is displayed in the second part of Table II.

Districts I and II are those where the PN is under represented most, to the tune of 8.74% and 11.71% respectively. In each of these constituencies, therefore, the last MLP candidate who was elected is unseated, and the seat is offered to the as-yet unelected NP candidate who has most votes. It is therefore clear that in such a system, any candidate who is 'elected' is deemed to have done so only provisionally, subject to subsequent seat changes. A candidate can have his 'election' confirmed or repealed by subsequent adjustments to the STV.

In this way, not only is nationwide proportional representation achieved, but also the number of seats in Parliament is held constant at a value of 65 MP's. Each district still returns 5 members, so that regional representation is equitably maintained. Further, the fact that a change of seats occurs where the offended party is most under represented encourages the drawing of constituency boundaries which are more likely to give proportional results.

The method is also readily applicable to more complex situations where many seat swaps are necessary to achieve nationwide proportional representation. The seat swaps can generally be easily resolved using the under representation matrix. For more on this topic, see Appendices III and IV at the end of this study.

The swaps in seats necessary to restore a given election to nationwide proportional representation is given in Table III for the elections of 1962, 1966, 1981, 1987, and 1992. The elections of 1971 and 1976 do not need any such adjustment.

TABLE II: The 1987 election. Change of seats to achieve nationwide proportional representation. Identification of districts where change of seats ought to happen. The PN should get 2 seats more according to nationwide proportional representation. So two districts are identified where the PN has a surplus of votes as shown below. For each district, one calculates the % first count votes cast to the PN in that district, as well as the percentage of seats obtained by the PN. The discrepancy

between these two percentages is a measure of the lack of representation of the PN in that particular constituency. It is given in the last column in this table. In the 1987 election, the maximum discrepancy occurred in Districts I and II as can be seen below. The MLP candidate who was elected last in each of these districts forfeits his seat to the PN candidate who is next in line to be elected.

District	PN party first count votes	Total first count votes	% Vote in District	Seats acquired in District	% Seats acquired in District	Under Representation in District (%)
I	8396	17226	48.74%	2	40%	8.74%
II	580	18317	31.71	1	20	11.71
III	6486	17917	36.20	2	40	-3.80
IV	7412	17656	41.98	2	40	1.98
V	8284	18437	44.93	2	40	4.93
VI	8746	18853	46.39	2	40	6.39
VII	8366	17562	47.64	2	40	7.64
VIII	11227	18317	61.29	3	60	1.29
IX	11884	18917	62.82	3	60	2.82
X	11259	17472	64.44	3	60	4.44
XI	11438	18651	61.33	3	60	1.33
XII	10986	18439	59.58	3	60	-0.42
XIII	9429	17404	54.18	3	60	-5.82

UNDER REPRESENTATION MATRIX (1987)

District	MLP	PN	OTHERS	
I	& -8.91%	* 8.74%	0.17%	... Maximum under representation ... of PN in the 13 districts.
II	&-11.83	*11.71	0.13	
III	3.72	-3.80	0.08	NB: * = Seat gain; & = Seat loss; positive % = under rep; negative % = over rep.
IV	-2.10	1.98	0.12	
V	-5.01	4.93	0.08	
VI	-6.53	6.39	0.14	
VII	-7.88	7.64	0.24	
VIII	-1.70	1.29	0.40	
IX	-3.20	2.82	0.38	
X	-4.89	4.44	0.45	
XI	-1.63	1.33	0.31	
XII	0.09	-0.42	0.33	
XIII	5.82	-5.82	0.00	

TABLE III: Swaps of seats to restore the elections of 1962, 1966, 1981, 1987 and 1992 to nationwide proportional representation. The District listed is that where the under representation of the offended party is maximum. The corresponding under representation is shown in the fourth column as a percentage.

Year	Seat Swap	District	Under Representation	Party seat is taken from	Party seat is given to
1962	PN to MLP	IV	7.47%	PN	MLP
	PN to PCP	IX	6.54	PN	PCP
	PN to CWP	X	14.06	PN	CWP
1966	PN to CWP	VI	7.54	PN	CWP
	PN to CWP	VII	9.53	PN	CWP
	PN to CWP	VIII	7.72	PN	CWP
1981	MLP to PN	I	8.56	MLP	PN
	MLP to PN	II	10.49	MLP	PN
1987	MLP to PN	I	8.74	MLP	PN
	MLP to PN	II	11.71	MLP	PN
1992	MLP to AD	IX	2.18	MLP	AD

METHOD A: AN STV ADJUSTED A POSTERIORI.

This method is proposed to achieve nationwide proportional representation by a posterior) adjustments to the STV, and can be described as follows:

i) Perform a Maltese Election exactly as at present, i.e. using STV with a Droop Quota in 13 constituencies; 65 members are provisionally elected, 5 from every constituency. These are at first elected on a provisional basis.

ii) Perform a nationwide count of first votes for each party contesting the election in a) . Hence assign the 65 seats available to the various parties using the divisor method of d'Hondt.

iii) If the provisional distribution of seats among the parties (in i) is exactly the same as the nationwide first count estimate (in ii), there is no need to dc perform seat swaps between the parties, and the result of the election in i) becomes permanent.

iv) On the other hand, if the two distributions differ, one has to decide which parties ought to gain or lose seats, how many seats to change, and in what constituency to perform each swap . The district for a swap will be that where the offended party is most under represented (see Tables II and III for details). In this case, one superimposes on the provisional result in i) the appropriate changes of seats between parties, thus obtaining the final result which automatically incorporates nationwide proportional representation.

PREDETERMINING THE NUMBER OF PARTY SEATS IN EACH DISTRICT.

In the previous sections, we used the d'Hondt divisor on the nationwide first count vote to determine the total number of seats to be assigned national to each party. Potentially, this was the most important step, because it guarantees proportional representation on a nationwide basis. We then proceeded with the STV election, and resolved any deviations from this ideal by performing relevant seat swaps *a posteriori*.

As an alternative method to the above, one could try to predetermine the distribution of a stipulated number of seats a party should get in each district, and hence allow a subsequently held STV to be guided by such a distribution. The next step is therefore to distribute the predetermined number of party seats amongst the various districts in an equitable way, and such that every district returns a pre-established number of members - this was fixed to 5 since 1976.

A possible solution to this is to fall back to the divisor method at the district level. The 5 seats in a given district are assigned by the divisor method to the contesting parties, on the basis of their votes. This is repeated for every particular district. One can then easily compute the total number of seats attained by a given party over all the districts. This procedure of assigning seats to parties by district can be termed the *districtwise divisor method*. This is to distinguish it from the other method of assignment, the *nationwide divisor method* (explained previously) based on the nationwide total of each party's votes.

There are some important questions to ask at this point:

- i) How does the districtwise estimate of a given party's seats compare with the seats actually gained in the election in each district separately, and over all districts?
- ii) How does the total number of seats of a given party calculated by the districtwise divisor method compare with the number of seats assigned to that party by the nationwide divisor method?

To clarify these points, we take the example of the General Election of 1987, and compare these quantities for this particular election. This is done in Table IV. In this table, we compare the nationwide divisor estimate of seats, with the districtwise divisor estimate, and with the total seats each party gained in that election. One can note that in this election, the number of seats computed by the divisor method for each party in each district coincides exactly with the corresponding number of seats actually gained in the election. This is therefore also true of the totals of seats over all the districts. In both cases, 34 seats are assigned to the MLP, and 31 to the PN. These estimates, however, vary from the nationwide estimate of seats which predicts 33 seats for the PN, and 32 seats for the MLP. In both cases, there is a discrepancy of 2 seats: the nationwide divisor method predicts 2 seats more for the PN, and 2 seats less for the MLP than the actual election or the districtwise estimate. Using the method of under representation as above, one can then adjust the districtwise allocation of seats to agree exactly with the distribution afforded by the nationwide divisor method, since this is the ideal solution which guarantees proportional representation on the national scale.

The nationwide and districtwise estimates of seats for the elections between 1962 and 1992 are shown in columns i) and ii) respectively in Table V. We also display the actual election result in column iii) in this table. The discrepancies between the various quantities are given in brackets and are measured from the nationwide estimate, which is the most desirable distribution of

seats.

It can be noted that in all elections between 1966 and 1992, the districtwise estimate of seats is exactly equal to the result of the actual election, whereas it is in general different from the nationwide divisor estimate. There is a maximum error of 3 seats between the nationwide and districtwise quantities for these elections.

For the election of 1962, however there is a substantial difference between the nationwide estimate and the districtwise estimate, and between these quantities and the actual election result. This is due to the CWP which had a consistent following in most of the constituencies, but did not have enough *first count* votes to win seats in the individual districts by the divisor method. The total nationwide of the CWP vote will eventually entitle it to a substantial number of seats. (The fact the CWP actually obtained several seats in the actual election is due to the fact that there were many vote transfers to it in the early counts of the actual election). In all, there is a discrepancy of 7 seats between the districtwise and nationwide estimates for the election of 1962, and most of this difference (4 seats) is due to the CWP!

Such a phenomenon occurred also in 1992. In this election, the AD had a small but consistent following in every district, but it did not have enough votes to elect a candidate in any of the constituencies. When AD's total nationwide vote is calculated, however, they will be entitled to one seat in Parliament.

The discrepancies between districtwise and nationwide estimates, can be resolved using the principle of under representation as was done for the previously described posterior method.

TABLE IV: THE ELECTION OF 1987. Comparison of the nationwide divisor estimate of seats, with the districtwise divisor estimate, and with the total seats each party gained in that election. One can note that the number of seats computed by the divisor method for each party in each district coincides exactly with the corresponding number of seats actually gained in the election. This is therefore also true of the totals of seats over all the districts. In both cases, 34 seats are assigned to the MLP, 31 to the PN, and none to the other parties. These estimates, however, vary from the nationwide estimate of seats which predicts 33 seats for the PN, and 32 seats for the MLP. In both cases, there is a discrepancy of 2 seats: The nationwide divisor method predicts 2 seats more for the PN, and 2 seats less for the MLP than the actual election or the districtwise estimate.

ELECTION 1987	Districtwise assignment of seats by divisor method.			Actual Election		
DISTRICT PARTIES PARTIES		
	MLP	PN	OTHERS	MLP	PN	OTHERS
I	3	2	0	3	2	0
II	4	1	0	4	1	0
III	3	2	0	3	2	0
IV	3	2	0	3	2	0
V	3	2	0	3	2	0
VI	3	2	0	3	2	0
VII	3	2	0	3	2	0
VIII	2	3	0	2	3	0
IX	2	3	0	2	3	0
X	2	3	0	2	3	0
XI	2	3	0	2	3	0
XII	2	3	0	2	3	0
XIII	2	3	0	2	3	0
TOTAL SEATS:	34	31	0	34	31	0
	<i>(This is the total of seals assigned to each party by the divisor method in each individual district).</i>			<i>(Actual seats attained by parties in election).</i>		
NATIONWIDE EST.:	32	33	0	32	33	0
	<i>(This is estimated by the d'Hondt divisor method on the nationwide totals of party votes. [It is written on the right hand side also for convenience.]</i>					
DISCREPANCY:	-2	20		-2	2	0
	<i>(This is the difference between the nationwide and the districtwise estimates).</i>			<i>(This is the difference between the nationwide estimate and the actual election).</i>		

TABLE V : Elections held in Malta between 1962 and 1992. Comparison of the number of seats obtained using the d'Hondt divisor method on i) the national total of first count votes, and ii) on the first count votes obtained by the parties in the districts separately. Column iii) gives the seats actually obtained in the given election. The discrepancies in the number of seats between method i), the first count nationwide estimate, and method ii), the first count districtwise estimate of seats, i.e. (i)-(ii), are given in parenthesis next to the column representing ii). The difference between the nationwide divisor estimate i) and the actual number of seats gained in the election iii) are also given in parenthesis next to column (iii). Please note that in this table discrepancies are measured from the nationwide estimate, which henceforth will be our norm. In the elections held on or after 1966, the districtwise estimate of seats is identical to the outcome of the election. For these elections also, the maximum discrepancy between nationwide and districtwise estimates is one of 3 seats (in 1966). In 1962, there is a considerable discrepancy of seven seats between the two estimates, mainly due to the small but consistent following of the CWP.

1962 ELECTION.

PARTY	1st count	Transfers to party	Final count	(i)	(ii)	(iii)
				D'Hondt 1st count Nationwide SEATS	d'Hondt 1st count District- wise SEATS	Actual Election; STV in 10 constit.
PN	63262	7442	70704	22	26 (-4)	25 (-3)
MLP	50974	24	50998	17	20 (-3)	16 (+1)
CWP	14285	-25	14260	5	1 (+4)	4 (+1)
DNP	13968	3030	10938	4	2 (+2)	4
PCP	7290	-3719	3571	2	1 (+1)	1 (+1)
pop	699	-577	122			
IND	128	-115	13			
TOTAL	150606	0	150606	50	50	50

1966 ELECTION.

PARTY	1st count	Transfers to party	Final count	(i)	(ii)	(iii)
				D'Hondt 1st count Nationwide SEATS	d'Hondt 1st count District- wise SEATS	Actual Election; STV in 10 constit.
PN	68656	6013	74669	25	28 (-3)	28 (-3)
MLP	61774	340	62114	22	22	22
CWP	8594	-3055	5539	3	0 (+3)	0 (+3)
PCP	2086	-1494	592			
DNP	1845	-1543	302			
IND	392	-261	131			
TOTAL	143347	0	143347	50	50	50

1971 ELECTION.

PARTY	1st count	Transfers to party	Final count	(i)	(ii)	(iii)
				D'Hondt 1st count Nationwide SEATS	d'Hondt 1st count District- wise SEATS	Actual Election; STV in 10 constit.
MLP	85448	297	85745	28	28	28
PN	80753	1321	82074	27	27	27
PCP	1756	-1530	226			
OTHERS	102	-88	14			
TOTAL	168059	0	168059	55	55	55

1976 ELECTION.

PARTY	1st count	Transfers to party	Final count	(i)	(ii)	(iii)
				D'Hondt 1st count Nationwide SEATS	d'Hondt 1st count District- wise SEATS	Actual Election; STV in 13 constit.
MLP	105854	-113	10574	34	34	34
PN	99551	141	99692	31	31	31
Others	35	-28	7			
TOTAL	205440	0	205440	65	65	65

1981 ELECTION.

PARTY	1st count	Transfers to party	Final count	(i)	(ii)	(iii)
				D'Hondt 1st count Nationwide SEATS	d'Hondt 1st count District- wise SEATS	Actual Election; STV in 13 constit.
MLP	109990	1	109991	32	34 (-2)	34 (-2)
PN	114134	16	114150	33	31 (+2)	31 (+2)
Others	29	-17	12			
TOTAL	224153	0	224153	65	65	65

1987 ELECTION.

PARTY	1st count	Transfers to party	Final count	(i)	(ii)	(iii)
				D'Hondt 1st count Nationwide SEATS	d'Hondt 1st count District- wise SEATS	Actual Election; STV in 13 constit.
MLP	114936	259	115195	32	34 (-2)	34 (-2)
PN	119721	43	119764	33	31 (+2)	31 (+2)
Others	511	-302	209			
TOTAL	235168	0	235168	65	65	65

1992 ELECTION.

PARTY	1st count	Transfers to party	Final count	(i)	(ii)	(iii)
				D'Hondt 1st count Nationwide SEATS	d'Hondt 1st count District- wise SEATS	Actual Election; STV in 13 constit.
PN	127932	1802	129734	34	34	34
MLP	114861	1535	116396	30	31 (-1)	31 (-1)
AD	4186	-3337	849	1	0 (+1)	0 (+1)
TOTAL	246979	0	246979	65	65	65

End of Table V.

METHOD B: THE DISTRICTWISE A PRIORI METHOD.

This method is proposed to achieve nationwide proportional representation by a priori adjustments to the STV, and can be described as follows:

- i) Perform the first count of a General Election as carried out presently in Malta, but without referring to candidates' names. This first step will determine the first count vote for every party in each district.
- ii) Find the grand total of votes each party polls over the different districts. This will give the nationwide first count vote.
- iii) Calculate the nationwide estimate of seats won by a party using the d'Hondt divisor method. This gives the definitive number of candidates that will be elected from a given party.
- iv) Calculate the number of first count votes each party polls in each district, and by simple addition, deduce the districtwise estimate of seats. (This estimate very often turns out to be identical to the actual outcome of the STV as carried out at present).
- v) If the nationwide and districtwise estimates are equal, the latter estimate will give the correct distribution of party seats in each district, which on adding over all districts will automatically give the desired nationwide proportionality.
- vi) If the districtwise estimate of seats differs from the nationwide estimate, the appropriate number of seats are swapped between parties in the individual districts as explained above. After the swaps, nationwide proportionality will have been achieved, and the districtwise estimate so modified will give the number of candidates to be elected from each district for each party.
- vii) The first count votes are now inspected for the candidates' names, and the STV election can proceed exactly as in previous elections. In a given district, the predetermined number of candidates of a given party, as explained in v) or vi) above, are elected. The number of candidates a party can win in a district has to be equal to this preassigned number, and cannot exceed it. Counting of votes for a party or transfer of votes to that party's candidates can then be stopped in that district, once the predetermined number of candidates for that party is elected.

A DIRECT METHOD FOR ASSIGNING SEATS TO DISTRICTS.

In the previous sections, an attempt was made to find the definitive distribution of the nationwide seats of a party by finding the divisor distribution for each district, and hence affecting a number of pertinent seat swaps to achieve nationwide proportionality. Whereas it is generally easy to perform these swaps, hypothetical elections can be conjured up, in which it can prove to be difficult to determine which swaps are required. In this section an easier and more direct distribution of the nationwide seats amongst the districts is described. This procedure is done for the election of 1962 in Table VI. In Appendix V the analysis is done for all General Elections on and after 1966, and also for a hypothetical election in which it proved to be difficult to implement the seat swaps described previously.

We now discuss the output for the election of 1962 in Table VI. The first count votes of each party in each district is first given, followed by the national total of first count votes. The number of nationwide seats for each party is then calculated using the d'Hondt divisor method, and written in the next line.

For each party, the percentage vote it obtained in each district is calculated and written down in a matrix as shown below. The sum of each row adds up to 100%. This matrix gives the relative strength of each party in a given district. It gives the number of votes a party would have obtained if there were 100 valid votes cast in that district.

The parties are then sorted in descending order of first count votes obtained on the national level, and district seats will be assigned to the parties in this order. Referring to the election of 1962, the PN is the largest party, and so we start by assigning its nationwide complement (22) of seats amongst the districts. The 22 seats are assigned amongst the 10 districts by the d'Hondt divisor method on the basis of the relative strength of the party in the districts. (Whereas before, seats were assigned to the various parties in a given district, the divisor method can be analogously used to assign seats to districts for a given party. It is as if the districts are competing between themselves to gain these 22 seats.)

The percentages of the PN in the 10 districts (given in the second column in the last matrix mentioned) are multiplied by a suitable factor, say 100, for convenience and are written in a row under the heading of the corresponding district. Since 5 seats are at first available to each district, these quantities are divided by divisors 1, 2, 3, 4, 5 and the quotients are written in the appropriate column. One then proceeds to choose, as in the divisor method, the largest 22 numbers from these 50 numbers. The number of numbers chosen in each column gives the number of PN candidates assigned to that district. In the first district for instance, the PN was assigned 2 seats leaving 3 seats still available in that district for the other parties. Similarly in the second district 4 seats are left for the other parties since the PN managed to get only 1 seat in this district. In the tenth district, the PN obtains 3 seats, leaving the remaining 2 seats for the other parties.

The second assignment is then performed for the second largest party, the MLP. Its vote percentages in the districts are multiplied by a suitable factor, say 100, for convenience, and are written in a row under the corresponding district heading. They are then divided by the divisors 1, 2, ... up to the number of seats still available in that district. In the first district only the first 3 quotients are written in the relevant column, since only 3 seats are left for that district. Similarly, in the second district, only 4 quotients are calculated since that is the number of seats still available for that district. This is done also for the other districts. The largest 17 numbers are then chosen from the ten columns for the assignment of the 17 seats of the MLP in the ten districts. Thus for example, the MLP gets 2 and 3 seats respectively in the first two districts, leaving 1 seat still available for the other parties in each of these districts.

It is clear that this procedure can be repeated until the seats of every party are all assigned to the various districts. The final seat distribution by party and by district obtained in this manner can be termed the *partywise* distribution of seats. This is to distinguish it from the *districtwise* distribution explained previously.

The partywise distribution of seats is given at the end of the analysis of each election. This distribution is compared to the

result of the actual election. A + near a number signifies that that party got an extra seat in that district in the actual election. Conversely, a - sign indicates that the party got a seat less in that district in the election. Thus for example, in 1962, in the II district, the PN got one seat more, and the CWP one seat less in the actual election than what is shown in the actual table. The plusses and minuses for the other districts, can be similarly interpreted.

The partywise distribution of seats automatically satisfies the constraint of nationwide proportional representation. It is independent of the configuration of the district boundaries, and hence does not necessitate any seat swaps. This is in direct contrast with the districtwise distribution which usually needs a number of seat swaps to be restored to proportionality.

TABLE VI. Direct assignment of the nationwide seats of a party to the various districts for the election of 1962. This depends solely on the percentage vote of the party in a given district, and does not depend on seat swaps. It is therefore easier to implement. The divisor method is used to distribute a party's seats between the districts on the basis of its relative (percentage) strength in the districts. It is as if the districts are competing with each other to obtain the party's seats. This distribution is termed the *partywise* distribution, to distinguish it from the previously described *districtwise* distribution. See also Appendix V at the end of this study, for elections after 1962.

ELECTION OF 1962.

Number of parties is 7. Number of seats is 50. Number of districts is 10. Number of seats/ district is 5.

DISTRICTS	PARTIES.						
	MLP	PN	PCP	CWP	DNP	DCP	IND
I	5532	7556	795	979	1720	143	0
II	9170	4359	178	1672	937	0	0
III	6512	4908	269	1704	656	0	0
IV	6919	6226	245	681	505	0	0
V	4860	7051	404	1069	784	0	0
VI	3457	7072	621	1579	1419	247	0
VII	4493	6152	2397	1489	2285	152	0
VIII	5292	5588	697	1853	1399	116	0
IX	3896	7368	981	1366	1353	41	0
X	843	6982	703	1893	2910	0	128
TOTAL VOTE:	50974	63262	7290	14285	13968	699	128
NATIONWIDE SEATS:	17	22	2	5	4	0	0

% vote of each party by district:

I	33.076	45.178	4.753	5.854	10.284	0.855	0.000
II	56.203	26.716	1.091	10.248	5.743	0.000	0.000
III	46.352	34.935	1.915	12.129	4.669	0.000	0.000
IV	47.468	42.714	1.681	4.672	3.465	0.000	0.000
V	34.303	49.767	2.851	7.545	5.534	0.000	0.000
VI	24.015	49.128	4.314	10.969	9.858	1.716	0.000
VII	26.479	36.256	14.127	8.775	13.467	0.896	0.000
VIII	35.410	37.390	4.664	12.399	9.361	0.776	0.000
IX	25.965	49.104	6.538	9.104	9.017	0.273	0.000
X	6.263	51.876	5.223	14.065	21.621	0.000	0.951

Parties in descending order of size: PN, MLP, COOP, DNP, PCP.

Direct assignment of seats (1962):

PN scan

District	I	II	III	IV	V	VI	VII	VII	IX	X	TOTAL
Seats available:	5	5	5	5	5	5	5	5	5	5	65
%*100:	4518	2672	3494	4271	4977	4913	3626	3739	4910	5188	
1	4518 *	2672 *	3494 *	4271 *	4977 *	4913 *	3626 *	3739 *	4910 *	5188 *	
2	2259 *	1336	1747 *	2136 *	2489 *	2457 *	1813 *	1870 *	2455 *	2594 *	
3	1506	891	1165	1424	1659 *	1638	1209	1246	1637	1729 *	
4	1130	668	874	1068	1244	1228	907	935	1228	1297	
5	904	534	699	854	995	983	725	748	982	1038	
Choose largest 22					Smallest	1683	in District	VI	Seat	3.	
PN	2	1	2	2	3	3	2	2	2	3	22
Seats still available:	3	4	3	3	2	2	3	3	3	2	28

MLP scan

District	I	II	III	IV	V	VI	VII	VII	IX	X	TOTAL
Seats available:	3	4	3	3	2	2	3	3	3	2	28
%*100:	3308	5620	4635	4747	3430	2402	2648	3541	2597	626	
1	3308 *	5620 *	4635 *	4747 *	3430 *	2402 *	2648 *	3541 *	2897 *	626	
2	1654 *	2810 *	2318 *	2374 *	1715 *	1201	1324	1771 *	1299	313	
3	1103	1873 *	1545	1582 *			883	1180	866		
4		1405									
Choose largest 17					Smallest	1582	in District	IV	Seat	3.	
MLP	2	3	2	3	2	1	1	2	1	0	
Seats still available:	1	1	1	0	0	1	2	1	2	2	

CWP scan

District	I	II	III	IV	V	VI	VII	VII	IX	X	TOTAL
Seats available:											
	1	1	1	0	0	1	2	1	2	2	11
%*100:	585	1025	1213	467	754	1097	878	1240	910	1407	
	1 585	1025 *	1213 *	467	754	1097 *	878	1250 *	910	1407 *	
	2 585						439		455	704	
Choose largest	5			Smallest		1025	in District		II	Seat	1
CWP	0	1	1	0	0	1	0	1	0	1	5
Seats still available:											
	1	0	0	0	0	0	2	0	2	1	6

DNP scan

District	I	II	III	IV	V	VI	VII	VII	IX	X	TOTAL
Seats available:											
	1	0	0	0	0	0	2	0	2	1	6
%*100:	1028	574	467	347	553	986	1347	936	902	2162	
	1 1028 *	574	467	347	553	986	1347 *	936	902 *	2162 *	
	2						674		451		
Choose largest	4			Smallest is		902	in District		IX	Seat	1
DNP	1	0	0	0	0	0	1	0	1	1	4
Seats still available:											
	0	0	0	0	0	0	1	0	1	0	2

PCP scan

District	I	II	III	IV	V	VI	VII	VII	IX	X	TOTAL
Seats available:											
	0	0	0	0	0	0	1	0	1	1	2
%*100:	479	109	192	168	285	439	1425	470	656	527	
	1						1425 *		656 *		
Choose largest	2			Smallest is		656	in District		IX	Seat	1
PCP	0	0	0	0	0	0	1	0	1	0	2
Seats still available:											
	0	0	0	0	0	0	1	0	1	0	2

ALL SEATS ARE NOW ASSIGNED.

FINAL SEAT ASSIGNMENT IN DISTRICTS (1962):

District	I	II	III	IV	V	VI	VII	VIII	IX	X	TOTAL
PN	2	1+	2	2+	3	3	2	2	2+	3	22
MLP:	2	3	2	3-	2	1	1	2	1	0	17
CWP:	0	1-	1	0	0	1	0+	1	0+	1-	5
DNP:	1	0	0	0	0	0	1	0	1-	1+	4
PCP:	0	0	0	0	0	0	1	0	1-	0	2
TOTAL:	5	5	5	5	5	5	5	5	5	5	50

Each + indicates that in that district a party gained one more seat in the actual election. Thus for example, the PN got an extra seat in the II, IV and IX district in the actual election. Plus and minus signs should balance in each district.

See also Appendix V at the end of this study for elections on and after 1996 and for a hypothetical election where seat swaps were difficult to implement.

End of Table VI.

METHOD C: THE PARTYWISE A PRIORI METHOD.

This method is proposed to achieve nationwide proportional representation by a priori adjustments to the STV, and can be described as follows:

- i) Perform the first count of a General Election as carried out presently in Malta, but without referring to candidates' names. This first step will determine the first count vote for every party in each district.
- ii) Find the grand total of votes each party polls over the different districts. This will give the nationwide first count vote.
- iii) calculate the nationwide estimate of seats won by a party using the d'Hondt divisor method. This gives the definitive number of candidates that will be elected from a given party. List the parties in descending order of their nationwide first count vote.
- iv) Starting with the largest party, calculate the percentage of first count votes a given party polls in each District. These percentages give the relative strength of the party in the various districts. The nationwide seats of the party are then distributed amongst the districts. The number of seats still available to the remaining parties in each district is then calculated.
- v) This process is repeated for the smaller parties until all the remaining seats have been assigned.
- vi) The distribution of seats as described in iv) and v) is the partywise distribution of seats, and is identical to the nationwide distribution of seats.
- vii) The first count votes are now inspected for the candidates' names, and the STV election can proceed exactly as in previous elections. In a given district, the predetermined number of candidates of a given party, as explained in iv), v) or vi) above, are elected. The number of candidates a party can win in a district has to be equal to this preassigned number, and cannot exceed it.

Counting of votes for a party or transfer of votes to that party's candidates can then be stopped in that district, once the predetermined number of candidates for that party is elected.

COMMON ADVANTAGES OF METHODS A, B AND C

The proposed systems A, B, and C afford numerous advantages:

- i) Nationwide proportionality is necessarily guaranteed;
- ii) The total number of seats in Parliament is fixed at 65;
- iii) Regional representation is preserved, since 5 members are returned from every district;
- iv) The voter will be required to vote in exactly the same way as he did before. The proportional adjustments to the election are transparent to him;
- v) Since the number of seats is fixed and parties gain seats at the expense of other parties, the system is more difficult to be exploited by a number of parties working in collusion to manipulate the number of seats in their favour;
- vi) The system is fair to all parties whether large or small; in particular a party which obtains many votes nationwide but still fails to win a seat can obtain representation in Parliament by this method;
- vii) In methods A and B, swaps of seats between parties are done in a logical way; ie. seats will change where the offended party is most under represented - this will in fact actually encourage the drawing of fair constituency boundaries.

COMPARISON OF METHODS A, B WITH C.

viii) In method A, the STV is carried out exactly as usual, and this will certainly please diehard advocates of STV. However, the result of the STV has to be necessarily treated as provisional, and potentially subject to subsequent seat swaps. Also candidates who are 'unseated' could feel a little cheated of success if their seat happens to be repealed by a subsequent swap.

ix) In methods A and B, the notion of under representation is an attractive mechanism to redress an inherent injustice in the STV, that is the possible lack of nationwide proportionality in the partial result. However, it can turn out to be quite difficult to determine which swaps are necessary to achieve proportionality in the final result.

x) The method C does not suffer from the disadvantages listed in viii and ix, because it does not necessitate any seat swaps to achieve a proportional result. Besides, since the number of seats for each party in each district is determined a priori, candidates in an election will not feel so aggrieved if they do not succeed in being elected. By method C (and B also), the candidates are simply not elected, rather than first 'elected' and then 'unseated' as in Method A.

xi) Because of the reasons given in viii, ix, and x, Method C seems to be superior to the other two methods. It arrives at the final distribution of seats in an elegant manner, without necessitating any seat swaps. The reason for this is that unlike A and B, the method C is independent of the district boundaries.

THE STV IN METHOD C.

The STV is an important feature of all the three methods proposed in this study. In all of these, the important features of STV are retained as far as possible. It is clear that an STV conducted exactly as it was prior to 1987 could easily lead to a non proportional result, which is not at all desirable by any standards. These three methods all retain the STV process with a minimum of amendments, and this only to attain an outcome which is deemed fair both by the parties and the electorate.

The ethos of the STV process is maintained throughout. Votes are still inherited from candidate to candidate, from party to party. It is only when the STV deviates from proportionality, that such amendments come into play, and this only to achieve a highly desirable end. In Method C (and B also), counting of votes and transfers to a party stop when it has gained its complement of seats in the district. Although this seems unnatural in an STV, it is not at all different from the normal STV. Here counting stops when all the five candidates of the district are elected, irrespective of the nationwide result.

Fervent supporters of the STV method of election, who are also keen on the democratic principle of nationwide proportionality, should consider methods A, B and C to be logical extensions to the STV process, which ultimately serve to make the system even fairer than it was before. All parties, whether large or small, are treated by these methods in as fair a manner as one is liable to get in any electoral system. In particular, small parties which do not get a whole quota in the individual constituencies, stand to gain several seats in parliament on the basis of their nationwide first count vote. The individual parties, whatever their size, should not be apprehensive of methods such as are described in this study.

The personal preference of this author is for Method C, the *a priori* partywise distribution. This seems to be the most streamlined process, without- either the need of any seat swaps, or the need of 'unseating' a provisionally elected candidate. Unlike Methods A and of B also, Method C is independent of the constituency boundaries.

CALCULATIONS.

The first count votes, transfers, the candidate data and the other raw data used above for the General Elections between 1962 and 1992 were obtained from the book by John C. Lane quoted below. For each election, the first count votes were added together over the districts to find the quota: vote for each party. The divisor method of d'Hondt was used to estimate the number of seats won nationwide by each party. The predetermined number of seats is then chosen with the highest vote to seat ratio. The same procedure is also carried out for the final count vote. These calculations were performed using Lotus 123 Version 2.01.

Various other divisors are mentioned in the literature, so we repeated the analysis with the St. Lague system of divisors. The d'Hondt estimate for the number of seats was found to be always nearer the actual election result than the predictions of the St. Lague system. For clarity and simplicity, we therefore decided to discuss only the d'Hondt estimates in the text.

The calculation of the number of seats using the d'Hondt estimate was also corroborated: by entering the nationwide vote counts into

a GWBASIC program called Divisor.bas. This automatically calculates the number of seats won by a party in a given election.

The simulation of elections between three parties was done using a GWBASIC program called Simulate.bas. Paragraphs i) to v) of the previous section were illustrated by this simulation.

A floppy disc containing these items of software is included for the perusal of the reader.

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There were 5 appendices to the Buhagiar report, providing additional detail and illustrations of his proposals.

These appendices are omitted here.