

Joint Standing Committee on Electoral Matters
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Submission on the conduct of the 2007 Federal Election

Terms of reference: On 12 March 2008, the Senate agreed to the following resolution:

1. *That the following matters be referred to the Joint Standing Committee on Electoral Matters for inquiry and report:*

All aspects of the 2007 Federal election and matters related thereto, with particular reference to ...

Recommendations:

1. That the Federal and State Governments review as a matter of urgency the method used in the calculating of the surplus transfer value used in the determination and counting of the Senate election with the view to adopting a value of the vote based formula
2. That the system used in calculating the tabulation of the vote be modified so as to ensure that the value of remainders is retained and distributed with the value of the ballot papers.
3. That the system of aggregation and segmentation of ballot papers attributed to a candidate to be excluded be reviewed so as to implement a single transfer of all ballot papers simultaneously or alternatively this could also be achieved by implementing a system of "re-iterative counting", where the electronic count of the vote is restarted whenever a candidate is to be excluded.

If segmentation of the vote is to be retained then votes should be segmented and distributed on the basis of first in - first out

I request that the Committee review the issues raised in this submission as a matter of importance and review the current practices so as to ensure that the system used is proportional and based on the principle of one vote one value.

Should you require further information or clarification I can be contact via return email.

I would be pleased to make a further submission at any future hearings.

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Senate: Calculation of Surplus Transfer Value

The current formula used to determine the surplus transfer value seriously distorts the proportionality and value of the vote.

The formula used is based on the value of a candidate's surplus divided equally by the number of ballot papers allocated to the candidate who holds a surplus value. Ballot papers received by a successful candidate at a fraction of its original value are transferred at the same value as a ballot paper that held a significantly higher value. The result of this distortion in the value of the vote can result in the election of a candidate not based on merit or voters support.

The system currently used was adopted as a trade off at a time when the method of counting the ballot was undertaken by a manual process. With the use of computer aided counting the system and formula used is no longer justified and should be reviewed.

The Parliament should review the current formula and adopt a formula based on the value of the vote as opposed to the number of ballot papers.

Analysis of the Victorian Senate Vote

With the adoption of above-the-line voting the impact of the distortion in the calculation of the surplus transfer value is limited as in most cases the required number of candidates to be elected is determined prior to the distribution of all preferences.

In the situation where the results of the Senate election are close the distortion in the calculation and distribution of the vote can play an unfair decisive role in the determination of the elections results. Analysis of the 2007 Victorian Senate results indicates that the extent of distortion in the results of the election could be as high as 6,000 to 10,000 votes.

It should be noted that the distortion in the value of the vote did not affect the overall result in the 2007 ballot.

HOWEVER

In a realistic hypothetical situation (See example B below) had the One Nation Party preferenced the Liberal Party ahead of the Australian Labor Party in their registered ticket the results of the election would have produced a different outcome with the value of minor party votes being devalued and the value of the Liberal Party ticket vote would have increased in value disproportionately delivering an added value of 6,000 votes or more to the Green number 1 candidate.

This distortion in the results is derived from the fact that the value of the Liberal Parties 3rd candidate surplus was calculated based on the number of allocated ballot papers disregarding the fact that some ballot papers had a significantly higher value than other ballot papers. The impact of this distortion has a significantly greater impact in small elections where above-the-line voting does not apply (Such as in local government elections)

With the adoption and use of computer aided counting systems this distortion need not apply. A formula based on the value of each of the votes as opposed to the number of ballot papers would be more accurate and democratic.

Calculation of the Surplus value

(See below for detailed explanation and examples)

The current method, as prescribed in the Commonwealth Electoral Act, for calculating the surplus transfer value used in proportional representation elections is based on the number of ballot papers as opposed to the proper method of basing the calculation on the value of the vote.

The current method seriously distorts the one vote - one value principle increasing the value and influence of votes that have already determined the election of previous candidates disproportionately to other votes.

This can and will produce a different outcome in the election and as such can bring the system of proportional representation into disrepute. (See examples below)

The current formula used to calculate an elected candidate's surplus is seriously flawed and MUST be reviewed. The greater the number of candidates to be elected the greater the distortion in the one vote one value principle.

This submission requests that the Government review its legislation so as to maintain the one-vote one-value principle and correct calculation of the proportionality of the vote.

Segmentation of the vote in the distribution of preferences of an excluded candidate

Currently the Australian Government Electoral Commission segments and aggregates ballot papers of an excluded candidate based on the value of the ballot papers received by the excluded candidate. In distributing excluded candidates votes the AEC aggregates all votes with the same value and distributes the votes based in the order of nominated value. The segmentation of the distribution based on the aggregate value of the vote can also produce an unfair decisive outcome in the results of the distribution process. It was originally introduced to limit the extent of distortion that occurs as a result of the paper based surplus transfer value.

The aggregating and segmentation of the vote is another outdated system left over from the need to facilitate the ease of a manual count. With the adoption of a computer counting system and the use of a value based surplus transfer formula there is no real justification to maintain the aggregated segmentation distribution of the ballot.

With a computer count based on the value of the vote (see item above) it is feasible and realistic to distribute all votes' simultaneously in one transaction per candidate.

If segmentation is determined to be desirable then it should be undertaken on a First-In-First-Out (FIFO) basis as opposed to the distribution of all votes of the same value.

The main problem with the current segmentation system used is related to the aggregated transfer of secondary primary votes in the later stages of the count.

The transfer of aggregated secondary primary votes that have been previously transferred to the candidate that is being excluded seriously impacts on the order of election and the calculation of the surplus transfer value as a candidate that may be elected as a result of an aggregated secondary primary-vote preference transfer.

With the use of computer aided technology in the calculation of the results of the election there is no need to continue the practice of segmentation.

One Single Transaction per Candidate

The electoral process should be one transaction per candidate - be it a transfer of surplus votes or the transfer of preference votes allocated to an excluded candidate.

A single transaction would simplify the counting process as the number of transactions would be significantly less than that adopted in the segmentation system currently used.

First in - First Out (FIFO) Segmentation

If segmentation is to be used (*not recommended*) it should on the basis of a *First in First Out (FIFO)* system. Ballot papers should be distributed according to the order in which they were received. This would increase the number of transactions per candidate but as the count is now conducted by electronic computer aided technology a *FIFO* system would be preferable to the current aggregated value system.

Re-Iterative Counting process (Preferred Option)

A preferred alternative to segmentation and distribution of preferences of excluded candidates would be to implement a re-iterative counting process where the count is restarted each time a candidate is to be excluded from the count. In the past this option would have been prohibitive, but with the use of computer counting systems a re-iterative count would be desirable. The count would continue until all positions are filled without the need for any further exclusions. Such a system would also make allowances for optional preferential voting and automatically adjusts the allocated required quota

Optional Preferential voting

Should the parliament give consideration to the adoption of optional preferential voting consideration should be given to the adoption of a reiterative voting counting system, where the counting of the vote is reset and recommenced following the exclusion of any candidate. The use of a reiterative counting system with the adoption of optional preferential voting would automatically make necessary and desirable adjustments to the calculation of the quota and transfer values used to determine the result of the election. Reiterations of the count would continue until all vacant positions are filled. The conduct of a reiterative count process is possible with the use of electronic computerized counting systems

Another anomaly in the system of proportional representation used is related to the system of segmentation used when distributing preferences from excluded candidates.

Aggregated Value Segmentation

The system of segmentation, as with the current formula used to calculate the Surplus transfer value, was designed to facilitate a manual count and to minimize the extent of distortion that results in the calculation of the Surplus Transfer Value (as outline above).

The current system is based on the aggregation of votes that have the same value allocated to the excluded candidate and are transferred as a separate transaction.

Remainders in the calculation of the transfer value

The system currently in place allocates any remainders that are left over in the count to a remainders column. As the count progresses the total value of remainders can become considerable and in a close election they could play a role in determining the order of elimination.

With the use of electronic computer aided technology it is possible for the value of the remainder to stay with the value of the ballot paper being transferred again simplifying the counting process whilst maintaining the correct proportionality of the count..

With the adoption of a value based transfer system (see above) the retention of the remainder value with the value of the ballot papers is highly desirable.

Whilst the odds of the remainders having an impact on the outcome of a Senate election is small nevertheless, in theory, in a very close election, this could play a decisive factor in the outcome of the election.

Multi-member constituencies (Senate)

Examples and explanatory comments

1. The Australian Electoral Commission (AEC) formula.

The problem that exists with the system adopted and prescribed by the Commonwealth Electoral Act is that it does not support the "One vote - One value" principle and it is not simple.

Each vote should be equal in value but with the system currently adopted there is a serious distortion in the value of the vote attributed to elected candidates

The formula currently used to calculate the "Surplus Transfer Value" is (the value of the candidate's surplus, divided by the total number of ballot papers received by the candidate).

On the face of it this formula appears to provide for the proportional allocation of a candidates surplus and, yes, this is the case in respect to votes that are allocated at full value (1) Primary Preferences.

The problem in adopting this formula is that it seriously distorts the calculation of the transfer value when a candidate's surplus includes allocated votes received from a previous surplus distribution.

The formula outlined in the legislation and used by the AEC allocates each vote received at the same value even though some votes have different values to other votes. As a result the value of a previously elected candidate's votes is inflated at the expense of other votes allocated and used in calculating the transfer value.

The variation in the value of the vote can and will produce a different outcome and result, as is demonstrated in the example count sheet below.

Whilst the AEC might try to argue that the overall outcome is still the same (and yes the result might be the same) this is not always the case.

The likelihood of the system distorting the outcome of the election is significantly increased in State/Municipal elections where the voter sample is smaller in number. The bigger the voter sample the less are the chances of the results being different.

The impact of this distortion is further exacerbated with an increase in the numbers of candidates to be elected, as would be the case in an full senate count.

2. The Alternative method/formula.

There is a very simple correct alternative formula that should be used in the calculating of the transfer value.

The "Surplus" (S) value divided by the "Candidates Total Value" of votes (Ctv) and then multiplied by the value of the vote (Vv) allocated. $(S/Ctv*Vv)$

This formula supports the “One Vote – One Value” principle and is easily calculated and maintains the correct proportionality of the vote as opposed to the distortion that exists within the formula used by the AEC.

Example A: Calculation of the Surplus Transfer Value

Below is an example count sheet demonstrating the differences in the two systems.

The example is based on a small voter sample of 1800 votes. The number of candidates to be elected is three and the quota has been calculated at 1800 divided by 4 = 450. There are five candidates A, B, C, D, E and their preference allocations is as follows:

Candidate A Preferences	1,2,3,4,5
Candidate B Preferences	2,1,5,4,3
Candidate C Preferences	2,3,1,4,5
Candidate D Preferences	3,4,5,1,2
Candidate E Preferences	5,4,3,2,1 and 2,3,4,5,1

The Primary vote received by each candidate was: (Shown in numerical order for clarity)

Candidate	Primary Vote
Candidate A	600
Candidate B	350
Candidate C	300
Candidate D	300
Candidate E	255

Candidate A had received in excess of a quota and was declared elected and the value of the surplus votes was calculated and allocated to the next candidate in order of preference. As this was the first transfer of a Surplus the original value of the votes used was at full value (1). In this case the calculation of the Transfer value of the votes is the same using both the AEC and the Alternative formula.

No of Ballot Papers (P)	600
Value of Vote (Vv)	1
Candidates Total Vote (Ctv)	600
Quota (Q)	450
Surplus (S)	150
Transfer Value (Tv)	0.250
Tv x P	150

The allocation of Candidate A’s surplus vote (150) to Candidate B elects Candidate B and in turn provides a second surplus value that needs to be distributed.

It is at this point that the difference between the two formulas becomes apparent.

	<i>(Alternative formula)</i>		<i>AEC Formula</i>
	Primary Vote	Surplus of Candidate B received from Candidate A	
No of Ballot Papers (P)	350	600	950
Value of Vote (Vv)	1	0.250	
Candidates Total Vote (Ctv)	500		500
Quota (Q)	450		450
Surplus (S)	50		50
Transfer Value (Tv)	0.100	0.025	0.053
Tv x P	35	15	50

Formula

$$((Ctv-Q)=S) / Ctv * Vv$$

$$((Ctv-Q)=S) / P$$

As shown the use of the AEC formula has devalued the value of Candidate B's primary vote and inflated the proportional value of the surplus received from Candidate A destroying the "One Vote – One value" principle. Where as in the Alternative formula the proportional value of the vote is maintained – thus maintaining the "One vote – One value principle"

If we view the full count sheet for each system.

Count Sheet - Alternative Model - Correct weighted vote value

Quota			450			
Elected	0	1	2			3
Candidate A	600	Quota				
Candidate B	350	500	Quota			
Candidate C	300	300	315	440	440	
Candidate D	300	300	335	460	Quota	
Candidate E	250	250	250	Excluded		
Remainder						10
	1800	1800	1800			1800

Candidates A, B and D declared elected. – maintains One vote – One value principle

Count Sheet - AEC model.

Quota			450			
Elected		0	1	2		3
Candidate A		600	Quota			
Candidate B		350	500	Quota		
Candidate C		300	300	332	457	Quota
Candidate D		300	300	318	443	
Candidate E		250	250	250	<i>Excluded</i>	
Remainder						10
		1800	1800	1800		1800

Candidates A, B and C declared elected. – does not fulfill One vote- One value principle

Conclusion

The formula, as outlined in the Commonwealth Electoral Act, used to calculate the Transfer value (Tv) MUST be changed so as to reflect the correct proportional value of the vote whilst retaining the “One vote – One value” system

The Electoral Matters Committee should consider this issue as a matter of importance this issue when reviewing Australia’s electoral system.

Example B - Hypothetical Vote distribution

The analysis below of the 2007 Victorian Senate vote:

Based on a realistic hypothetical assuming that group A One Nation Ticket vote was distributed to the Liberal Party prior to the Australian Labor Party.

This situation would have required the full-distribution of the Liberal Party's third candidate surplus.

Using the current AEC surplus value formula based on the number of ballot papers the Greens would have received a bonus equivalent value of 6267 votes which would have seen the Greens Party elected to the sixth position disproportionately to the overall vote.

Using a more accurate and correct distribution based on the value of each vote the Australian Labor Party should have been elected.

This situation can work against all parties and the analysis below is presented by way of demonstrating the serious flaw and distortion in the value of the vote and the way the Australian Electoral Commission currently calculates the results..

With the use of a computer based counting system there is no need or justification that warrants the continued use of the formula based on the number of ballot papers as opposed to determining the correct proportional value of the vote

Table: Final distribution of Ryan, Scott (Liberal Party) Surplus

			AEC Based formula	Value based Formula
Group	Candidate Surname	First Name	Ryan Surplus	Ryan Surplus
			Score	Score
A	HOWARD	Ainslie	0	0
A	ROZAIRO	Sashikala	0	0
B	STEEL	Nick	0	0
B	SHORE	Daniel	0	0
C	ALLISON	Lyn	0	0
C	CHIPP	Greg	0	0
C	McCUBBIN	Jo	0	0
D	LOVE	Madeleine	0	0
D	THOMPSON	Robyn	0	0
E	ROSE	Robert	0	0
E	BARRETT	Jenny	0	0
F	COLLINS	Jacinta	454625	454625
F	MARSHALL	Gavin	454625	454625

F	<i>FEENEY</i>	<i>David</i>	<i>453106</i>	<i>459371</i>
F	LEWIS	Marg	0	0
G	PARKER	Brett	0	0
G	GRAHAM	Matt	0	0
H	FIFIELD	Mitch	454625	454625
H	KROGER	Helen	454625	454625
H	RYAN	Scott	454625	454625
H	SWAYN	Simon	0	0
I	TOSCANO	Joseph	0	0
I	PIERCE	Jude	0	0
J	BYRNE	Peter	0	0
J	BAPTIST	Tania	0	0
K	PLUMRIDGE	Gary	114	117
K	RAWSON	Miriam	0	0
K	PODBURY	Monique	0	0
K	WILLIS	Chris	0	0
K	HEATH	Clare	0	0
K	BOWN SEELEY	Ann	0	0
L	CLANCY	Steve	0	0
L	SAW	Geoff	0	0
M	RASKOVY	Steve	0	0
M	LEWAND	Viesha	0	0
N	MULHOLLAND	John	0	0
N	FLOOD	Gerry	0	0
N	LA MANNA	Pat	0	0
N	EVELYN-LIARDET	Teresa	0	0
N	WELLS	Ken	0	0
N	CREA	Paul	0	0
O	McDONALD	Ewan Angus	0	0
O	CLARNETTE	Dallas	0	0
P	PERKINS	John	0	0
P	CONWAY	Andrew	0	0
Q	AFFLECK	Rachel	0	0
Q	ISHERWOOD	Katherine	0	0
R	HALL	Brendan	0	0
R	ZABANEH	John	0	0
S	WINDISCH	Margarita	0	0
S	SMITH	Jeremy	0	0
T	KALINIY	Joseph	0	0
T	MESARITIS	Koulla	0	0
U	<i>DI NATALE</i>	<i>Richard</i>	<i>456022</i>	<i>449755</i>
U	O'CONNOR	Jenny	0	0

U	BHATHAL	Alexandra	0	0
U	REIHER	Jim	0	0
U	PHAM	Hoa	0	0
U	HENLEY	Emma	0	0
V	KLEIN	Tony	0	0
V	KLEIN	Amanda	0	0
W	RHODES	Junelle	0	0
W	GIBILISCO	Peter	0	0
W	KARADIMOS	Patricia	0	0
UG	WALKER	Norman	0	0
UG	O'BRYAN	Darryl	0	0
UG	GROVES	Llewellyn John	0	0
UG	SENER	Tejay M	0	0