

Problems with the Senate Counting System

Example based on 2007 Victorian Senate Count

At the end of Count 214 in the 2007 Victorian Senate count, the following four candidates remained in the count. The quota for election was 454,625.

Votes	Quotas	Candidate (Party)
448,120	0.9857	David Feeney (Labor)
353,070	0.7766	Scott Ryan (Liberal)
423,408	0.9313	Richard Di Natale (Greens)
138,798	0.3053	Gary Plumridge (Family First)

Plumridge was the next candidate excluded. His votes included ticket votes for five groups with next preference for Scott Ryan. These were Family First (77,147 ticket votes), the D.L.P. (32,026), the Christian Democrats (6,358), Conservatives for Climate and Environment (4,003) and Non-Custodial parents Party (1,344). The only ticket votes with Family First showing preferences to Labor were One Nation (12,557). There were a further 5,363 below-the-line votes.

All votes with Plumridge at full value were distributed at the next count. This elected both Scott Ryan and David Feeney. The totals were as follows

Transfer	Votes	Quotas	Candidate (Party)
+13,856	461,976	1.0162	David Feeney (Labor)
+123,698	476,768	1.0487	Scott Ryan (Liberal)
+1,032	424,440	0.9333	Richard Di Natale (Greens)
-138,710	88	0.0002	Gary Plumridge (Family First)

One Nation had lodged a preference ticket that had Labor ahead of the Liberal Party, with the Greens last. If One Nation had put the Liberal Party ahead of Labor on the ticket, then when Family First was excluded, Labor's David Feeney would not have reached a quota and the preferences of the Liberal Party's surplus to quota votes would have been distributed.

What is even more remarkable is that if One Nation had put the Liberal Party ahead of Labor, then the Greens' Richard Di Natale would have won the final vacancy, not Labor's David Feeney.

This would have occurred due to the formula used by the AEC to weight votes when determining the preferences of surplus to quota votes. There are different methods in which preferences can be weighted. The purpose of this discussion is to look at the different ways in which votes could be weighted and the impact this can have on a Senate Count.

Re-Constructing the Liberal Vote

The following examples takes the count at the end of count 214 and makes one change to what occurred at the 2007 election. It has been assumed that the One Nation ticket flowed to the Liberal Party before Labor. All other votes are assumed to have flowed as in the actual count.

The other assumption that has had to be made is the value of the transfer value that applies to Liberal Party ticket votes transferred to Ryan from the first two Liberal candidates, Mitch Fifield and Helen Kroger. There were in total 1,249,731 Liberal ticket votes. At count 214, these all resided with Ryan, but at a reduced transfer value of 0.275739.

Using the changed One Nation ticket total, the totals at the end of Count 215 would now be:

Transfer	Votes	Quotas	Candidate (Party)
+1,299	449,419	0.9885	David Feeney (Labor)
+123,698	489,325	1.0763	Scott Ryan (Liberal)
+1,032	424,440	0.9333	Richard Di Natale (Greens)
-138,710	88	0.0002	Gary Plumridge (Family First)

On this count, Feeney remains 5,206 votes short of a quota, while Ryan has a surplus of 34,700 preferences. For the purpose of this example, I will ignore the residual of 88 Family First votes, and proceed to the next count which is to distribute Ryan's surplus.

What occurs is that the weightings applied to the ballot papers held by Ryan will determine whether Feeney or Di Natale win the final position. On my calculation based on the system used for the Senate Count, Di Natale would win the final seat on this count. Under an alternative method which could be used, Feeney would win the last position.

To understand how these different outcomes occur, we need to look at the composition of Ryan's vote. As we know the source of the ticket votes, we can re-construct the final count.

Re-Constructed Count For Scott Ryan (Liberal): Victoria 2007

Party Ticket	Ballot Papers	Transfer Value	Votes	as % of Votes	as % of Ballots	Next Pref
Liberal/National	1,249,731	0.275739	344,599	70.42	89.62	GRN
Cons Climate Env (*)	4,033	1.000000	4,003	0.82	0.29	GRN
Socialist Equality	754	1.000000	754	0.15	0.05	GRN
Family First (*)	77,147	1.000000	77,147	15.77	5.53	ALP
D.L.P. (*)	32,026	1.000000	32,026	6.54	2.30	ALP
One Nation (*)	12,557	1.000000	12,557	2.57	0.90	ALP
Christian Democrat (*)	6,358	1.000000	6,358	1.30	0.46	ALP
C.E.C.	1,584	1.000000	1,584	0.32	0.11	ALP
Non-Custodial Parents (*)	1,344	1.000000	1,344	0.27	0.10	ALP
Group T	496	1.000000	496	0.10	0.04	ALP
Below-the-line	8,252			1.72		
Total ballots/Votes	1,394,454		489,325			

(*) – transferred from Family First, the last bundle of votes received.

The problem that occurs at this point occurs because of the difference between a 'ballot paper' and a 'vote'. A ballot paper is a physical piece of paper, or these days, the stored computer version of its preferences. A vote is the ballot paper times its transfer value, or more normally the total of ballot papers multiplied by the transfer value. It is this distinction between ballot papers that is at the heart of what follows.

Quota Preferential voting is a generic term for all different versions of multi-member preferential voting used in Australia, whether it be Hare-Clark or different versions of the Senate system. Under all different forms of Quota Preferential voting, the surplus value is the same, Ryan's vote minus the quota, a surplus of 34,700.

What differs is the votes examined to determine the the votes to distribute as preferences. There are three common methods.

Gregory method

Used in Hare-Clark, the Gregory method is sometimes called the 'last bundle' method. The bundle of votes examined for preferences at this point would be those votes transferred from Family First at the last count. The surplus is 34,700, the votes transferred 123,698, the transfer value 0.2805219. Only the 4,033 ticket votes for Conservatives for Climate and Environment had preferences for the Greens, so the overwhelming proportion of preferences distributed under this method would flow to Labor and elect David Feeney.

Inclusive Gregory method

This is the current Senate system. Rather than only look at the votes distributed at the last count, all votes held by the candidate at the point where they were elected are examined to determine surplus to quota preferences. However, the Inclusive Gregory method now uses ballot papers rather than votes to determine preferences. Our surplus is 34,700, but our ballot papers to be examined is 1,394,454, a transfer value of 0.0248842.

Under this system, the last candidate elected in the Victorian example would be Richard Di Natale. How will be explained in a moment.

Weighted Inclusive Gregory Method

This method is the same as the Inclusive Gregory method, except that ballot papers retain their transfer values, so determining the distribution of preferences is done by transferring votes, not ballot papers. In the Victorian example, the surplus is 34,700, the votes 489,325, the transfer value 0.0709140.

Under this system, David Feeney would win the final vacancy.

Why do Inclusive Gregory and Weighted Inclusive Gregory Produce Different Results?

In the table on the previous page, the votes for Ryan were broken down by source. The final three columns expressed these sources as a % of Ryan's votes, as a % of Ryan's ballot papers, and the next preference for these votes. The following table accumulates the previous table by next preference

Scott Ryan (Liberal): Votes by Next preference

Next Preference	Ballot Papers	Votes	Weighted Inclusive % of Votes	Inclusive Gregory % of Ballots
Green	1,254,488	349,356	71.40	89.96
Labor	131,512	131,512	26.88	9.43
Below-the-line	8,252		1.72	
Total ballots/Votes	1,394,454		489,325	

Under the Inclusive Gregory method, all of Ryan's ticket votes received from the Liberal Party suddenly come into the equation at their original ballot paper value. This means that in the 34,700 ballot paper surplus of Ryan, we suddenly are over-sampling the Liberal vote. Where only 71.40% of the votes held by Ryan were Liberal ticket votes that helped elect him, when we look at his preferences, the Liberal preferences now makes up 89.96% of his ballot papers.

Under the Inclusive Gregory method, only 9.43% of the 34,700 votes flow to Labor. That is a total of only 3,272 votes flowing to Labor, where Labor need 5,206 to elect Feeney. The use of the Inclusive Gregory Method has resulted in Liberal ticket votes making up 89.62% of preferences, as opposed to 70.42% which was the number of Liberal ticket votes that were part of Ryan's total of votes.

The Weighted Inclusive Gregory method would sample votes for preferences at their present transfer value, which is their value as votes rather than ballot papers. In the above table, that means 26.88% of votes have next preference for Labor, and with a surplus of 34,700, that would mean 9,327 preferences for Labor, enough to elect Feeney.

Conclusion

With electoral systems, the question is not always a matter of being right or wrong. As outlined above, there are several different ways in which votes could have been counted at the point where Scott Ryan was elected. The purpose of this exercise has been to try and illustrate that there are different methods of doing the calculations, and consideration should be given to whether the most appropriate method is currently being used.

The Senate's voting system can always produce perverse results, even more so with the use of ticket voting which can guarantee the delivery of preferences. As shown in the previous example, just switching One Nation preferences to flow to the Liberal Party ahead of Labor resulted in Labor falling just short of a third quota and resulted in Liberal preferences being distributed.

If this was just a result of One Nation preferences, I would not consider this a problem. Whenever a party's votes flow through another party, there is always the chance their value will be discounted by them becoming part of a candidate's surplus to quota votes.

But as this example has shown, the preferences of all parties are not always treated the same. In this example, the Liberal Party's preferences are given greater weight than other parties at the point where Ryan was elected and his preferences were distributed.

The current Inclusive Gregory method, by using ballot papers rather than votes, gives greater weight to the preferences of any party that has already exceeded a full quota of votes. In the example used here, instead of all votes used to elect Ryan being used to determine preferences, all ballot papers are used. The Inclusive Gregory method effectively determines preferences in this case by looking at the surplus as a proportion beyond the third quota.

It is my argument that it would be better to use the Weighted Inclusive Gregory method as outlined above. This would mean that the proportion of votes distributed from Ryan as surplus to preferences would be in the same proportion as the votes that elected Ryan. Instead of the earlier quotas of the major party coming into play in determining preferences, only the votes at present value of the elected candidate would be considered.

The problem of using the Inclusive Gregory Method had been outlined before in JSCEM submissions, though I believe the explanation I have given here provides a better illustration of the problem.

The Western Australian Electoral Act has been recently amended to introduce the Weighted Inclusive Gregory Method. It is the first jurisdiction to move in this way. I believe it is important that the JSCEM should consider recommending that the Commonwealth Electoral Act be amended in the same manner.