The Case for Meek for STV in Scotland

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Abstract

Using the votes in the STV elections for local government in Glasgow in 2007, this paper argues that the voters' wishes would have been better met, in two wards, if Meek's method had been specified for making the count. The results in the other 19 wards would not have been changed.

Keywords: Glasgow, Gregory method, Meek method, Scotland, STV, WIGM

1 Introduction

Articles about STV in Scotland by Curtice [2] and by Gilmour [3] are both informative and interesting, but it is disappointing that neither of them gives any indication of how and why the particular form of STV now used in Scotland, the Weighted Inclusive Gregory Method, known as WIGM [7], was chosen. However, that is not intended as a criticism of those authors. While accepting that WIGM is better than traditional versions of STV, it is regrettable that WIGM was chosen rather than the Meek method [4, 5]. It is the aim of this paper to show why it is regrettable.

The main differences between the two methods are: (1) WIGM continues the traditional practice of jumping over already-elected candidates when transferring votes while Meek gives new surpluses to such candidates, for further redistribution; (2) WIGM uses a constant quota based on the original number of valid votes while Meek reduces the quota whenever votes become non-transferable, in accordance with the current number of active votes. This reduced quota then applies to all candidates, and those already elected get new surpluses to be transferred.

Those who support any particular version of a voting procedure, rather than an alternative version, are always under a slight disadvantage in trying to prove their point, in that if short simple examples are presented showing their preferred method to be superior, they are told that those examples are too artificial and that real votes are quite different. While it is true that we must never take such artificial examples too seriously, they nevertheless can be useful in showing where and how things can go wrong in rival systems. If, on the other hand, real results are presented, the information is usually voluminous, making it difficult to show in detail what is happening. What is more, real voting patterns are, quite often, regarded as confidential information, not to be published, while such result sheets as are published are useless for detailed analysis.

In the present instance the data for the 21 wards for local government within the City of Glasgow in 2007 have been published in full [1] and, as those results are public knowledge, they have become a precious resource for research purposes. The fact that they are voluminous means that it is not easy to present short reports on them, but the fact that they are real election data is more important than that.

This paper argues that those data provide evidence supporting the proposition that Meek's method is better than other STV methods. There is, of course, no suggestion here that the count was wrongly conducted; every election must be counted in accordance with the rules in force, and that was done.

For the present paper, the voting figures for each of the 21 wards were re-analysed using the Meek method. It was found that in only two of the 21 wards does Meek give a different result from that actually observed. That is not many,

but it is very important in those particular cases. If it is thought not worth using a different method for so few changes, it should be noted that, in every single case, WIGM elected the same candidates as would have been elected by more traditional STV methods, such as the current rules of the Electoral Reform Society [6] for example.

Furthermore there were only three wards (Baillieston, Craigton and Partick West) in which those elected by WIGM were different from those who would have been elected had only first preferences been looked at, the transfers making no difference. Such figures are sometimes misrepresented as what would have happened from a "first past the post" election, but that is quite incorrect because these are multi-seat wards and each voter is allowed only one first preference, not one for each available seat. The fact that transfers so rarely made a difference does not make transfers unimportant. It merely means that, in the majority of cases, the result was clear enough anyway. This does not mean that the Single Non-transferable Vote (SNTV) would be almost as good, because it is the knowledge that votes will be transferred when appropriate that gives voters the freedom to express genuine preferences without worry about strategic implications. Under SNTV voters have to worry about wasting their votes on non-elected candidates, or on large surpluses for elected candidates.

In implementing the two methods, a precision of five decimal figures after the decimal point has been used, as laid down in the regulations, for WIGM, but nine figures after the point, as used in New Zealand, for Meek. There is no reason to suppose that this difference alters the results. In the following presentation all figures have been rounded to one decimal for the sake of simplicity.

The two wards where Meek would have given a different result from WIGM are analysed below. The Pollokshields ward is taken first because it involves a slightly simpler analysis.

2 The Pollokshields ward

The actual result using the WIGM rules, as specified in the Scottish regulations, elected Khalil Malik (Scottish National Party), David Meikle (Scottish Conservative and Unionist Party), and Irfan Rabbani (Scottish Labour Party). With the same votes using Meek rules, Malik and Rabbani would still have been elected but Ian A. Ruffell (Scottish Green Party) would have been elected instead of Meikle.

The decision between Meikle and Ruffell could be considered marginal for WIGM but not for Meek. At the point where the decision between them had to be made, using WIGM their votes were 1839.5 and 1835.2 respectively, while using Meek they were 1916.5 and 2007.4 respectively. The Meek result sheet would have been as shown in Table 1.

2.1 Analysis of the Votes

There were 4117 ballot papers that do not mention either Meikle or Ruffell. These can be ignored as contributing nothing, whichever rules are used.

1730 papers that mention Meikle, without mentioning Malik, Rabbani or Ruffell before Meikle, each contribute 1 vote to Meikle whichever rules are used.

1591 papers that mention Ruffell, without mentioning Malik, Meikle or Rabbani before Ruffell, each contribute 1 vote to Ruffell whichever rules are used.

661 papers that mention Meikle, without mentioning Ruffell before Meikle, and may be reduced in value by having contributed to Malik and/or Rabbani, give 186.54 to Meikle by Meek, but 109.53 by WIGM.

1468 papers that mention Ruffell, without mentioning Meikle before Ruffell, and may be reduced in value by having contributed to Malik and/or Rabbani, give 416.39 to Ruffell by Meek, but 244.23 by WIGM.

A few typical cases of the papers that may be reduced in value, and the amount received by Meikle or Ruffell from each, are shown in Table 2. The full information can be obtained from the author on request.

2.2 Discussion

All candidates except Malik, Meikle, Rabbani and Ruffell are excluded by the time the choice between the final two candidates is made.

Table 1**.** Election result sheet for Pollokshields ward of Glasgow 2007, if the Meek method had been used.

Number to be elected = 3
Total valid vote = 9567

	Count 1 To elect Irfan Rabbani To exclude Ali Ashraf		Count 3 To exclude Fatima Uygun		Count 4 To exclude Karin Currie		Count 5 To elect Khalil Malik To exclude Muhammad Shoaib
Quota	2391.7		2357.1		2333.5		2301.6
Ali Ashraf	184.0	0.0%	0.0		-		-
Karin Currie	438.0	100.0%	454.5	100.0%	471.4	0.0%	0.0
Khalil Malik	2057.0	100.0%	2126.7	100.0%	2247.9	100.0%	2306.1
David Meikle	1435.0	100.0%	1454.2	100.0%	1461.9	100.0%	1594.8
Isabel Nelson	863.0	100.0%	897.1	100.0%	919.6	100.0%	1006.1
Irfan Rabbani	2575.0	91.1%	2362.2	90.9%	2396.2	88.5%	2361.8
Ian A Ruffell	1043.0	100.0%	1100.6	100.0%	1202.9	100.0%	1280.6
Muhammad Shoaib	592.0	100.0%	614.3	100.0%	634.0	100.0%	657.1
Fatima Uygun	380.0	100.0%	419.0	0.0%	0.0		-
Non-transferable	0.0		138.4		233.1		360.4
Total	9567.0		9567.0		9567.0		9567.0

	Count 7 To exclude Isabel Nelson		Count 11 To elect Ian A Ruffell To exclude David Meikle		
Quota	2181.4		1978.8		
Ali Ashraf	-		-		
Karin Currie	-		-		
Khalil Malik	87.5%	2271.5	69.8%	1996.2	Elected
David Meikle	100.0%	1650.4	100.0%	1916.5	
Isabel Nelson	100.0%	1110.5	0.0%	0.0	
Irfan Rabbani	79.7%	2281.2	63.5%	1995.1	Elected
Ian A Ruffell	100.0%	1412.0	100.0%	2007.4	Elected
Muhammad Shoaib	0.0%	0.0		-	
Fatima Uygun		-		-	
Non-transferable		841.3		1651.8	
Total		9567.0		9567.0	

Note: The counts shown are those where an election or exclusion is about to be made—the intervening counts are working towards the solution but cause no immediate action. The percentage figures show the fraction of each vote, or part of a vote, that is kept by the particular candidate at that count, the rest being transferred to the voter's next preference if any, or to "non-transferable" otherwise. The actions mentioned at the head of each column are those to be taken as a result of what appears in the column.

Table 2. Some typical ballot papers in the Pollokshields ward, with the amount of vote received by Meikle or Ruffell at the point where a decision had to be taken between them.

	Amount received by Meikle or Ruffell	
	Meek	WIGM
As **Ra** (Me or Ru)	0.36541	1.00000
Ra *As* (Me or Ru)	0.36541	0.07106
As *Ne* **Ma** *Cu* (Me or Ru)	0.30241	1.00000
As *Cu* **Ma** (Me or Ru)	0.30241	0.08867
Cu *Ne* **Ra** **Ma** (Me or Ru)	0.11050	1.00000
Ma *As* **Ra** *Sh* *Uy* *Ne* (Me or Ru)	0.11050	0.08867
Ra *Ne* *As* *Cu* **Ma** (Me or Ru)	0.11050	0.07106
Ra *As* **Ma** *Cu* (Me or Ru)	0.11050	0.00630

Note: The candidate names are shortened to just the first two letters. The notation *As* **Ra** (Me or Ru), for example, means a vote that gave Ashraf as first preference, Rabbani as second preference, Meikle or Ruffell as third preference. There may have been other preferences beyond those shown but they play no part. Names in bold face are of candidates who have already been elected; names in italics are of candidates who have already been excluded.

Using WIGM, there is distortion caused by the fact that the two candidates already elected would be sure of election on less than the original quota because some votes have become non-transferable, but they have to keep a full original quota nevertheless. This prevents either of the two contenders for the last place from reaching a quota when the decision has to be made. In contrast, using Meek, the decision is made by three of the four candidates having passed the reduced quota while the other one has not—the same quota applies to all and nobody is elected without reaching it.

The amount of vote that passes to Meikle or Ruffell, using Meek, depends only on whether Malik or Rabbani, or both of them, are mentioned earlier on the ballot paper. In comparison the WIGM figures are less consistent. They depend upon whether and where other, now irrelevant, candidates were mentioned. Even if no others at all were mentioned, under WIGM a ballot has to make contributions to both Malik and Rabbani if Rabbani is mentioned before Malik, but a contribution to Malik only if Malik is mentioned before Rabbani.

In the WIGM (official) count, the three winners ended with 2392.0, 2392.0 and 2217.9 votes respectively, while there were 2565.1 non-transferable votes. This appears to indicate that 73% of the votes were used and 27% wasted. In the Meek count, as presented here, the three winners ended with 1995.1, 1996.2 and 2007.4 votes respectively, while the runner-up had 1916.5 votes and 1651.8 were non-transferable. This appears to indicate that 63% of the votes were used and 37% wasted. It might be claimed that this indicates better usage of votes by WIGM.

However it is a standard part of the case for STV that votes are wasted not only when they end not assigned to an elected candidate but also when they end as part of an elected candidate's votes but in excess of those needed to be sure of election. If it is accepted that, as Meek demonstrates, a quota of only 1978.8 votes is, in the end, necessary, then it can be said that the wasted votes from WIGM are 413.2, 413.2 and 239.1 from the elected candidates plus the 2565.1 non-transferable, giving a total of 3630.6. Similarly the wasted votes from Meek are 16.3, 17.4 and 28.6 from the elected candidates plus 1916.5 and 1651.8 from the runner-up and non-transferable, also giving a total of 3630.6. What Meek wastes on unused votes WIGM wastes on keeping the quota unnecessarily high, so this particular argument does not help in making a judgement.

3 The Craigton Ward

The actual result using the WIGM rules, as specified in the Scottish regulations, elected

Ruth Black (Solidarity—Tommy Sheridan), Iris Gibson (Scottish National Party), Matthew John Kerr (Scottish Labour Party), and Alistair Watson (Scottish Labour Party). With the same votes using Meek rules, Gibson, Kerr and Watson would still have been elected but Gordon Macdiarmid (Scottish Labour Party) would have been elected in place of Black.

In neither case was the decision marginal. At the point where the decision between Black and Macdiarmid had to be made, using WIGM their votes were 1641.7 and 1493.1 respectively, using Meek they were 1821.5 and 1906.3 respectively.

The Meek result sheet would have been as shown in Table 3.

3.1 Analysis of the Votes

There were 3920 ballot papers that do not mention either Black or Macdiarmid. These can be ignored as contributing nothing whichever rules are used.

1439 papers that mention Black, but not Gibson, Kerr, Macdiarmid or Watson before Black, each contribute 1 vote to Black whichever rules are used.

1413 papers that mention Macdiarmid, but not Black, Gibson, Kerr or Watson before Macdiarmid, each contribute 1 vote to Macdiarmid whichever rules are used.

1259 papers that mention Black, but not Macdiarmid before Black, and may be reduced in value by having contributed to Gibson, Kerr and/or Watson, give 382.5 to Black by Meek, but 202.7 by WIGM.

3021 papers that mention Macdiarmid, but not Black before Macdiarmid, and may be reduced in value by having contributed to Gibson, Kerr and/or Watson, give 493.3 to Macdiarmid by Meek, but 80.1 by WIGM.

A few typical cases of the papers that may be reduced in value, and the amount received by Black or Macdiarmid from each, are shown in Table 4. The full information can be obtained from the author on request.

3.2 Discussion

The main reason for the different result seems to be that, at the time of the decision to exclude Black or Macdiarmid, Meek had already elected Kerr and redistributed his surplus, whereas WIGM had Kerr as still unelected and hence no votes come through from him. As a result the WIGM amount, as shown in Table 4, is sometimes zero.

Secondly, the fact that the WIGM quota stays at 2211.0, whereas the Meek quota has been reduced by this stage to 1881.1, means that Gibson and Watson are each keeping more votes under WIGM than they need, to be certain of election. Meanwhile Black was elected by WIGM not only without quota, but still short of even the reduced quota of the Meek method.

Thirdly, the values arriving at the two candidates under Meek depend only on which of Gibson, Kerr and Watson they have mentioned earlier, whereas the values arriving under WIGM can be changed by which excluded candidates they mentioned and where in the sequence they did so. For example for a voter with preferences starting Watson, Macdiarmid, under WIGM Macdiarmid receives only 0.00682 of a vote, whereas with preferences starting Petty, Watson, Macdiarmid he receives a full 1.0. Under Meek either of those voting patterns receives 0.21613, a much fairer result when Petty has been excluded and is thus totally irrelevant.

Other points are similar to those already mentioned above for the Pollokshields ward.

4. Conclusion

It is a great pity that the Scots should have adopted WIGM when Meek system was available, but the good features in WIGM are, of course, to be welcomed.

At least the chosen system is a good version of STV, and even the crudest form of STV is better than anything other than STV. The English still suffer from the grossly inferior multiple X-vote for their local elections.

5 Acknowledgement

An earlier version of this paper was offered to *Representation* but rejected by that journal. An anonymous referee, however, made many detailed suggestions for improvements. I am

Table 3. Election result sheet for Craigton ward of Glasgow 2007, if the Meek method had been used.

Number to be elected = 4
Total valid vote = 11052

	Count 1 To elect Iris Gibson		Count 3 To exclude Mark Dingwall		Count 4 To exclude Wullie McGartland		Count 5 To exclude Gordon Masterton
Quota	2210.4		2176.1		2167.1		2149.2
Ruth Black	1220.0	100.0%	1321.7	100.0%	1329.7	100.0%	1385.3
Scott R Coghill	457.0	100.0%	503.4	100.0%	511.2	100.0%	525.8
Mark Dingwall	225.0	100.0%	234.9	0.0%	0.0		-
Iris Gibson	2729.0	79.8%	2178.1	79.7%	2184.9	79.1%	2200.3
Matthew John Kerr	1920.0	100.0%	1976.3	100.0%	1995.1	100.0%	2012.6
Gordon Macdiarmid	1328.0	100.0%	1351.8	100.0%	1359.5	100.0%	1371.3
Gordon Masterton	315.0	100.0%	370.1	100.0%	392.5	100.0%	414.5
Wullie McGartland	224.0	100.0%	249.0	100.0%	258.1	0.0%	0.0
Scott Alexander Petty	569.0	100.0%	596.5	100.0%	699.0	100.0%	704.0
Alistair Watson	2065.0	100.0%	2098.7	100.0%	2105.2	100.0%	2132.1
Non-transferable	0.0		171.4		216.6		360.4
Total	11052.0		11052.0		11052.0		11052.0

	Count 6 To elect Alistair Watson		Count 7 To exclude Scott R Coghill		Count 8 To elect Matthew John Kerr		Count 12 To elect Gordon Macdiarmid	
					To exclude Scott Alexander Petty		To exclude Ruth Black	
Quota	2121.5		2114.1		2067.9		1881.1	
Ruth Black	100.0%	1465.4	100.0%	1485.7	100.0%	1573.5	100.0%	1821.5	
Scott R Coghill	100.0%	624.9	100.0%	635.8	0.0%	0.0		-	
Mark Dingwall		-		-		-		-	
Iris Gibson	77.3%	2196.3	74.6%	2123.4	74.3%	2214.4	59.8%	1889.7	Elec.
Matthew John Kerr	100.0%	2039.5	100.0%	2056.8	100.0%	2133.2	81.7%	1895.4	Elec.
Gordon Macdiarmid	100.0%	1389.3	100.0%	1406.4	100.0%	1445.2	100.0%	1906.3	Elec.
Gordon Masterton	0.0%	0.0		-		-		-	
Wullie McGartland		-		-		-		-	
Scott Alexander Petty	100.0%	730.2	100.0%	736.0	100.0%	803.1	0.0%	0.0	
Alistair Watson	100.0%	2161.7	98.1%	2126.6	97.6%	2170.2	78.4%	1892.5	Elec.
Non-transferable		444.7		481.3		712.3		1646.7	
Total		11052.0		11052.0		11052.0		11052.0	

Note: The counts shown are those where an election or exclusion is about to be made—the intervening counts are working towards the solution but cause no immediate action. The percentage figures show the fraction of each vote, or part of a vote, that is kept by the particular candidate at that count, the rest being transferred to the voter's next preference if any, or to "non-transferable" otherwise. The actions mentioned at the head of each column are those to be taken as a result of what appears in the column.

Table 4. Some typical ballot papers in the Craigton ward, with the amount of vote received by Black or Macdiarmid at the point where a decision had to be taken between them.

	Amount received by Black or Macdiarmid	
	Meek	WIGM
Co *Di* **Gi** *Mc* *Ms* (Bl or Md)	0.40220	1.00000
Gi (Bl or Md)	0.40220	0.18981
Pe **Wa** (Bl or Md)	0.21613	1.00000
Wa (Bl or Md)	0.21613	0.00682
Co **Ke** (Bl or Md)	0.18345	0.00000
Co *Di* **Gi** *Ms* *Pe* *Mc* **Wa** (Bl or Md)	0.08693	1.00000
Gi *Ms* *Mc* *Pe* **Wa** *Di* *Co* (Bl or Md)	0.08693	0.18981
Wa *Co* **Gi** (Bl or Md)	0.08693	0.00682
Gi **Wa** (Bl or Md)	0.08693	0.00129
Co **Gi** *Di* **Ke** (Bl or Md)	0.07378	0.00000
Wa **Ke** (Bl or Md)	0.03965	0.00000
Wa **Gi** **Ke** (Bl or Md)	0.01595	0.00000

Note: The candidate names are shortened to just the first two letters but, to avoid ambiguity, Macdiarmid and Masterton become Md and *Ms*. The notation *Pe* **Wa** (Bl or Md), for example, means a vote that gave Petty as first preference, Watson as second preference, Black or Macdiarmid as third preference. There may have been other preferences beyond those shown but they play no part. Names in bold face are of candidates who have already been elected; names in italics are of candidates who have already been excluded.

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extremely grateful to that referee, most of whose suggestions have been incorporated in the above text. Any remaining deficiencies are, of course, entirely my own fault.

6 References

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