



## **International Snapshot: Scotland 2007** **A Dry Run for Proportional Voting**

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### **ABSTRACT**

On May 3, 2007, Scottish voters used two proportional voting systems simultaneously: for the first time ever, choice voting (or the single transferable vote) for local councils, and once again, mixed member proportional voting for the Scottish Parliament. The local council elections saw increased participation and broadly representative results. Despite the first-time use of choice voting alongside a completely different voting system, error rates were, on average, remarkably low. The MMP elections ensured proportionality in seat shares and arguably prevented a wrong-winner result. There was early controversy over error rates allegedly around 10%, but actual error rates were lower. Later research moreover confirmed that voter error was due to critical ballot design flaws.

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## Introduction

On May 3, 2007, voters in Scotland elected a national Parliament and their local councils. Voters used two different voting systems. The Parliamentary elections were held under a mixed member proportional (MMP) system, while the local elections were conducted through the use of choice voting, called the single transferable vote (STV) in Scotland. Even though this was the first time choice voting was used for local elections, little confusion occurred, evidenced by a relatively low invalid ballot rate. Overall choice voting was successful in producing councils more representative of voters' preferences with almost 85% of the councils emerging from the elections with no overall control by one party. The result was one of the most accurate representations of Scotland's partisan diversity, which already had contributed to a multi-party system in both local and parliamentary elections. Therefore, council members have to reach across party lines in order to make progress, thus ensuring that multiple points of view are taken into account.

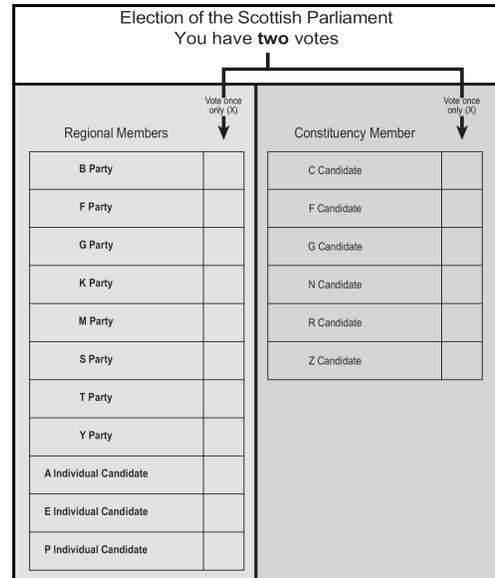
The parliamentary elections were more controversial than those for the local councils due to a relatively large number of invalid ballots. The invalid rate was not a result of the voting system but of poor ballot design and resulting voter confusion (see below). The main problems were (1) switching from two ballot papers to a single ballot used for both the list and district votes and (2) an ambiguous instruction on the single paper: "you have two votes." Scotland's rate of invalid ballots in the choice voting elections in fact was lower than typical of Northern Ireland, while the error in the MMP elections was more than ten times higher than in past years with a clearer ballot design on two separate ballots. Even so, some commentators have incorrectly used the number of invalidated votes as a criticism against MMP and proportional voting in general. Although the ballot design can be considered a failure, the use of MMP successfully led to fair political representation in the Scottish Parliament. If a winner-take-all system had been used, the Labour party would have won an absolute majority of seats even though they received only about one-third of the votes and fewer votes than their main opposition, the Scottish National Party.

These recent elections in Scotland show how proportional voting systems are viable, practical and more representative alternatives to winner-take-all systems. These systems can also encourage greater political participation, as shown in the significantly increased number of valid votes cast in the 2007 local council elections conducted with choice voting compared to the number from the 2003 local elections conducted under a winner-take-all system. These elections also show that a fair voting system does not necessarily make for a fair election. Voter education and excellent ballot design are also very important factors in ensuring a smooth election day.

# Electoral System Basics

## Mixed member proportional voting systems<sup>1</sup>

Under the mixed-member system used to elect the Parliament, 129 Members of Scottish Parliament (MSPs) are elected through two votes: a district vote electing 73 MSPs (one from each of the 73 districts, or constituencies) and a list vote electing 56 MSPs (an additional seven from each of eight regions). The district vote is conducted under a winner-take-all, non-majority voting system. Each district elects an individual candidate to be its representative in the Parliament, with the candidate with a plurality of the votes winning the district seat. There are several districts within a region, each electing a single MSP. The rest of the seats allocated to a specific region are distributed based on the results of the second vote, the list vote. On this ballot, each individual votes for a party. The list seats are distributed such that the resulting total number of seats (both the region's district seats and the regional seats) ends up being proportional to the percentage of the vote a party receives.



For a simple example of the MMP system in action, consider a hypothetical, non-Scottish region. This region has five districts, each with one seat, and five additional seats for the region at-large, for a total of ten seats in the region. In the district vote, candidates identified with Party A win a plurality of votes in each of two of the districts, so Party A will control two district seats. Candidates identified with Party B also win two districts and their respective seats, and a candidate identified with Party C wins in the final district. In the list vote, Party A wins 40% of the total regional vote, Party B wins 50% of the vote, and Party C wins 10% of the vote. The five remaining regional seats are distributed in such a way as to make the total number of seats a party controls proportional to the percentage of the vote a party received in the list vote. In this example, Party A would get two of the remaining five seats, for a total of four out of the ten regional seats, or 40%. Party B would be allocated three new seats, for a total of five, and Party C would not receive any new seats, for a total of one seat out of the ten regional seats available.

## Choice voting systems<sup>2</sup>

The 2007 local council elections in Scotland were different from those of previous years when members were chosen under winner-take-all, at-large systems. In these recent elections, the councils were elected under a choice voting, or STV, system.

Under choice voting, voters rank candidates in order of preference. In order to win, a candidate must receive an exact number of votes, called the “victory threshold,” or quota. In Scotland, this number is determined according to the Droop formula, which is calculated by dividing the total

<sup>1</sup> The Scottish Electoral Commission, “Voting in your Scottish Parliament Elections” <<http://www.votescotland.com/stv/178.html?pMenuID=10&pElementID=134>> Accessed June 1, 2007.

<sup>2</sup> Dr. James Gilmour, “Detailed Description of the STV Count in accordance with the Rules in the Scottish Local Government Elections Order 2007.” 19 April 2007. <<http://www.votescotland.com/stv/files/STV-WIGMCountDetailedDescriptionVS19Apr07.pdf>> Accessed June 4, 2007.

number of valid votes by one more than the total number of seats to be filled, and then adding one to the result. If the result is not a whole number, then the remainder is ignored. Any candidate to reach the threshold wins a seat.

Any votes in excess of threshold are “surplus.” In a winner-take-all system, these are votes that a candidate does not need in order to win; as such, they would be “wasted votes.” With choice voting, on the other hand, the surplus is counted for the next-ranked choices. In the most precise and fair method, which is the method used in the Scottish local elections, every vote a

Election of Council A, Z Ward  
 Instead of using a cross, number the candidates in the order of your choice.  
 Put the number 1 next to the name of the candidate who is your first choice, 2 next to your second choice, 3 next to your third choice, 4 next to your fourth choice and so on.  
 You can mark as many or as few choices as you like.

Party C	CANDIDATE A	
Party D	CANDIDATE D	
Independent	CANDIDATE H	
Party A	CANDIDATE J	
Party F	CANDIDATE Q	
Party E	CANDIDATE S	
Party B	CANDIDATE W	
Party A	CANDIDATE Z	

candidate received is counted at an equally reduced value for their respective next-ranked candidates. After all surpluses have been counted and all candidates meeting the victory threshold are awarded seats, the candidate with the fewest votes is eliminated if all seats have not yet been filled. His or her votes are then distributed among the remaining candidates according to the preferences that voters indicated on their ballots. This process continues until all of the available seats have been filled.

For example, consider a ward with three seats and five candidates (Red, Blue, Green, Yellow, and Purple) where 5,000 valid votes are recorded. The victory threshold needed to win a seat for this ward would be  $(5,000 / [3+1]) + 1 = 1,251$  votes. If Candidate Yellow received 2,300 first-choices, he would be elected to the council and his 1,049 surplus votes would be distributed among his four competitors by equally reducing in value all of his 2,300 votes and counting

them at that value to their respective second choices. Suppose this process caused Candidate Green to increase her vote total above the victory threshold to 1,500 votes. Green would then be elected to the second council seat allocated to the ward. Her 249 surplus votes would then also be redistributed among the three remaining candidates, again through equally reducing in value all 1,500 of her votes (including the partial votes received from Candidate Yellow) and counting them for next choices. Suppose this process did not allow another candidate to reach the threshold. Candidate Blue might have the fewest votes after this round of counting, so he would be eliminated. All of Blue’s ballots would be counted for their next-marked preferences at their current full value. If these ballots then pushed Candidate Purple over the victory threshold, she would receive the third and final seat, and Candidate Red would join Blue in losing the election.

## Performance of MMP

### Fairness of representation

The mixed member proportional system delivered much fairer seat shares in Parliament than would otherwise have been available in a winner-take-all system. Due to the use of MMP, voters were able to choose the candidates they specifically wanted representing their districts through the winner-take-all district vote, while still having the ability to choose the party in control of Parliament through the regional list vote.

Figure 1. Proportionality of seats to votes in the 2007 Scottish Parliament elections.<sup>3</sup>

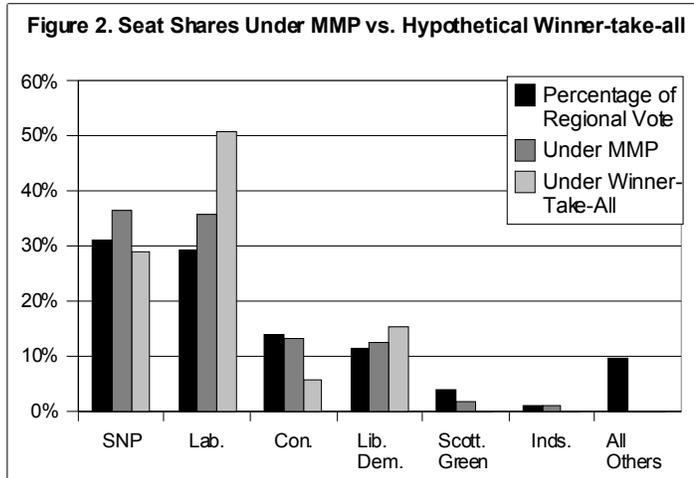
Party	Regional Valid Votes	% of Regional Valid Votes	Total Seats Received	% of Total Seats	Deviation From Proportionality
Scottish National Party	633,401	31.0%	47	36.4%	5.4%
Labour	595,415	29.2%	46	35.7%	6.5%
Conservative	284,005	13.9%	17	13.2%	-0.7%
Liberal Democrats	230,671	11.3%	16	12.4%	1.1%
Scottish Green	82,584	4.0%	2	1.6%	-2.5%
Independents	21,320	1.0%	1	0.8%	-0.3%
All Others	194,713	9.5%	0	0.0%	-9.5%
Totals	2,042,109	100.0%	129	100.0%	-----

Figure 1 demonstrates the proportionality of vote shares to seat shares in the Scottish Parliament. The regional vote was used to determine vote shares for this comparison instead of the district vote or some combination of the two because the regional vote controls for ticket-splitting by voters. When casting a ballot for the district representative, a voter may choose the candidate with whom he or she has the greatest personal connection, rather than the candidate from the party that most closely reflects the voter’s political ideology.

As demonstrated in Figure 1, the MMP system resulted in seat allocations with relatively low deviations from full proportionality. This proportionality allows the populace’s preferences to be fairly represented in Parliament in proportion to the voting strength of each block.

### How would a winner-take-all system affect the results?

Under a solely winner-take-all method of election, from a proportionality perspective, the results would have been markedly less fair. Figure 2 contrasts the actual results with hypothetical winner-take-all results. Unlike in Figure 1, the district vote was used to depict what would happen under such a system. Since the district vote is conducted under this system and the 73 districts combined represent every voter, one can expand the results of the district vote to a hypothetical, entirely winner-take-all voting system, where the Parliament has 73 seats, rather than the actual 129.



<sup>3</sup> Shares of votes and seats from: BBC News, “Scottish Elections 2007” <[http://news.bbc.co.uk/2/shared/vote2007/scottish\\_parliament/html/scoreboard\\_99999.stm](http://news.bbc.co.uk/2/shared/vote2007/scottish_parliament/html/scoreboard_99999.stm)> Accessed June 5, 2007.

Figure 3. Proportionality of seat allocation in hypothetical winner-take-all 2007 elections to the Scottish Parliament.<sup>4</sup>

Party	District Valid Votes	% of District Valid Votes	District Seats Received	% of District Seats	Deviation From Proportionality
Scottish National Party	664,227	32.9%	21	28.8%	-4.2%
Labour	648,374	32.1%	37	50.7%	18.5%
Conservative	334,743	16.6%	4	5.5%	-11.1%
Liberal Democrats	326,232	16.2%	11	15.1%	-1.1%
Scottish Green	2,971	0.1%	0	0.0%	-0.1%
Independents	25,047	1.2%	0	0.0%	-1.2%
All Others	15,384	0.8%	0	0.0%	-0.8%
Totals	2,016,978	100.0%	73	100.0%	-----

Whereas under the current MMP system the Conservatives are under-represented in the legislature by less than one percent, under a winner-take-all system, the party would have been under-represented by over 11%. This is a dramatic departure from voters' expressed wishes, as demonstrated by the votes the party received across the districts. This is likewise the case with the Labour party, which is over-represented by approximately 6.5% under a MMP system, but under a winner-take-all system Labour's over-representation jumps to over 18%. Under this system, Labour would also have achieved an absolute majority of the seats in Parliament even though the party received less than one-third of the total vote across the districts and fewer total votes than the Scottish National Party.

*“The most fundamental flaw was the ballot design of the party and constituency votes in two columns on the same page, rather than on separate pages.”*

- June 2007 University of Strathclyde study of the vote

### Controversy surrounding the MMP elections

Arguably the most controversial aspect of the elections to the Scottish Parliament was the relatively large amount of ballots determined to be invalid. Reports had initially put the range of error “as high as 10% [of the votes], although [it was] ultimately determined to be about 4% in the district vote [and] 3% in the” regional party list elections.<sup>5</sup>

The MMP voting system, however, was not the cause of voter error. Instead, the blame rests on poor ballot design and resulting voter confusion, as found by researchers at the University of Strathclyde in Glasgow, Scotland.<sup>6</sup> The “most fundamental flaw was the ballot design of the party

and constituency votes in two columns on the same page, rather than on separate pages.”<sup>7</sup> For

<sup>4</sup> Numbers of votes and seats from: BBC News, “Scottish Elections 2007” <[http://news.bbc.co.uk/2/shared/vote2007/scottish\\_parliament/html/scoreboard\\_99999.stm](http://news.bbc.co.uk/2/shared/vote2007/scottish_parliament/html/scoreboard_99999.stm)> Accessed June 5, 2007.

<sup>5</sup> Rob Richie, “Election Observers Abroad: Scotland’s May 2007 Elections” <<http://www.nonprofitvote.org/news/election-observers-abroad>> Accessed June 6, 2007.

<sup>6</sup> Eddie Barnes, “Ballot paper design at fault for record number of spoilt votes” *The Scotsman*, 24 June 2007.

<sup>7</sup> Rob Richie, as quoted in: Eddie Barnes and Murdo Macleod, “Election chaos unacceptable, say observers” *The Scotsman*, 6 May 2007.

example, the ballot told voters they had two votes to cast, but it was not always clear where on the ballot the voter was supposed to mark his or her choice. Some cast their two votes in the same category, such as for the regional party list or the district member candidate, thus invalidating their ballot. If the two categories had been on different pages, this confusion would likely not have been as severe. This poor ballot design was compounded in Edinburgh and Glasgow when a set of arrows telling people where to vote was taken off the ballot.<sup>8</sup> In order to make room on the ballot for the large numbers of parties in the party list vote, the Strathclyde researchers found that some of the voting instructions had been cut short. The researchers' report concludes that it "will come as no surprise to people familiar with election administration and ballot design that... altering the instructions to voters on the ballot would cause problems in election returns and ballot spoilage."<sup>9</sup> The MMP error rate in 2007 was more than ten times higher than in past years with two, more clearly designed separate ballots.

## Performance of choice voting<sup>10</sup>

### Degree of political participation

This first-time use of choice voting for Scottish local council elections was a definite success on both technical and democratic levels. The rate of error in these elections was relatively low, with an average of under 2%. Choice voting also saw a significant increase in participation. There were, on average, 7.4 candidates on each ballot for the elections to the councils. In the last local elections, the average was only 3.4 candidates. Likewise, in 2003 candidates ran unopposed in a total of 61 wards.

With the introduction of choice voting, the 2007 elections saw no unopposed candidates. This increase in competitive elections provides people with more say in who will represent them. Also on the rise in the recent elections was the number of valid votes cast, with an increase of approximately 9.5% from 2003 to 2007 (Figure 4). This climb in voter turnout reflects the enthusiasm of the voters in using an electoral system that provides them with an opportunity to more fully express their political preferences.

Figure 4. Number of votes cast in the two most recent local elections.

District	2003 Valid Votes Cast	2007 Valid Votes Cast	% Change
Aberdeenshire	83,550	95,944	14.8%
Glasgow	183,522	188,018	2.4%
Shetland	5,647	9,968	76.5%
<b>Scotland Total</b>	<b>1,875,790</b>	<b>2,053,607</b>	<b>9.5%</b>

<sup>8</sup> Barnes and Macleod, "Election chaos unacceptable"

<sup>9</sup> Barnes, "Ballot paper design at fault"

<sup>10</sup> Lewis Baston, Electoral Reform Society, "The local authority elections in Scotland 3 May 2007," 18 May 2007. <<http://www.electoral-reform-scotland.org.uk/downloads/Scottish%20LG%20report%20May%202007.pdf>>.

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## Fairness of representation

Like the MMP system used in the parliamentary elections, choice voting was effective in ensuring fair representation throughout the councils of Scotland. Under the previous winner-take-all system, one party controlled far more councils than any other party. In 2003, Labour won 42% of all the council seats, even though it only won about 33% of the total vote.<sup>11</sup> If choice voting had been in operation, Labour would have had around 100 fewer seats than it received.<sup>12</sup> Under choice voting in the recent elections, 27 of the 32 councils came under no overall control, ensuring coalitions and alliances will be forged if meaningful work is to be accomplished, with council members reaching across party lines. This cooperation will allow for multiple points of view to bear on the policy-making process and represent the range of Scotland's political diversity.

In addition to changes of council control, choice voting has allowed for a decrease in certain seats and districts being perceived as "hopeless" for a certain party to win. Labour, for example, was able to win in Newton Mearns, a relatively affluent ward and not a traditional stronghold for the party. On the other side of the spectrum, the Conservatives won in Ravenscraig, a ward in Scotland's industrial center. This ward, like Newton Mearns was for Labour, was a win that would be highly unlikely under winner-take-all.

The Scottish National Party benefited the most out of the parties that put forth candidates for seats. It has representation on all but two of the local councils, making it the party with the most extensive range of council members. It has support spread relatively evenly throughout the councils, with approximately one-quarter of the vote everywhere. Under a winner-take-all system, the party would not have had enough concentrated support for significant representation on the councils.

*"80.46% of voters ultimately cast ballots for winning candidates."*

Figure 5 depicts the relative proportionality of the distribution of council seats compared to the number of first choices each party received. For this analysis, three districts were chosen as a sample of the full 32-district result. The three districts of Aberdeenshire, Glasgow, and Shetland were chosen because of the variety of voter choice they represent. The Aberdeenshire council is under no overall control, Glasgow is under Labour control, and Shetland is controlled by Independents. Overall, the seat allocation was relatively proportional to voter preferences under the choice voting system. Deviations from full proportionality were kept comparatively low, with all the parties, other than the Liberal Democrats, under-represented by less than 3%. The Liberal Democrats were over-represented by less than 4%. The Independent council members, however, appear to be over-represented by almost 10%. This could be just the result of the choice of districts included in this sample, as one of the three districts, Shetland, is entirely controlled by Independent council members. The support for Independents was so strong that an established party put forth just five of the fifty total candidates for the district's council. None of the five won a seat, gaining a combined total of just 7.21% of the district's vote. This overwhelming support for Independent candidates in Shetland explains the apparent over-representation of independents in this three-district summary. The analysis conducted in Figure 5 also only takes into account voters' first choices. As votes are counted for next choices and voters' full preferences are taken into consideration, the proportionality of each party's representation on the councils balances out. This is especially true due to the fact that when all

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<sup>11</sup> John Curtice, "Never mind the ballots, what's the verdict on STV?" *The Scotsman*, 11 May 2007.

<sup>12</sup> Ibid.

the voters' choices are analyzed together, 80.46% of voters ultimately cast ballots for winning candidates.

Figure 5. Proportionality of seat allocation in a sample of the 2007 Scottish local council elections conducted under choice voting.<sup>13</sup>

Party	First Choices Received	% of Total First Choices	Council Seats Received	% of Council Seats	Deviation From Proportionality
Scottish National Party	78,967	26.8%	44	26.0%	-0.8%
Labour	86,582	29.4%	45	26.6%	-2.8%
Conservative	34,322	11.6%	15	8.9%	-2.8%
Liberal Democrats	40,127	13.6%	29	17.2%	3.5%
Scottish Green	13,640	4.6%	5	3.0%	-1.7%
Solidarity	9,195	3.1%	1	0.6%	-2.5%
Independents	23,560	8.0%	30	17.8%	9.8%
All Others	8,245	2.8%	0	0.0%	-2.8%
Totals	294,638	100.0%	169	100.0%	-----

### Ease of use and enthusiasm of voters

Since expressing preferences and ranking one's choices is an everyday activity for most people, there was relatively little voter error in the elections, resulting in a low spoilage rate of under 2% across Scotland, despite the fact that Scotland does not alert voters to over-vote errors at the polls as they do in the United States. Indicative of the ease with which people adapted to the new voting system, the vast majority of ballots were cast with more than one valid preference expressed on them. Many people, in fact, expressed three or more of their preferences on their ballots. This usually meant that voters would spread their ranked choices across multiple parties, an expression of choice not particularly well served by a winner-take-all system.

There were, however, some difficulties in the transition from the previous winner-take-all system to a choice voting system in the Scottish local council elections. One was that the local elections were held on the same day as the elections to the Scottish Parliament. Since both elections were held under different voting systems, there existed a need for voters to understand how and when to use each system. American voters have handled this situation extremely well in the United States – for instance, 99.9% of voters in Burlington, Vermont, cast valid instant runoff voting ballots for mayor in March 2006 even as the same ballot paper had several non-ranked voting races – but in Scotland it was one of several changes that collectively may have confused some voters. In the end, though, the electorate proved itself mostly able to handle the challenge, as shown in the relatively low rate of error for the local elections (allegedly the more complex one). Scotland's rate of invalid ballots in the choice voting elections in fact was lower than it typically is in Northern Ireland, which has used choice voting on and off since the late 19<sup>th</sup> century.

<sup>13</sup> For this table, three districts were chosen as a sample of the total 32-district result. These districts were Aberdeenshire, Glasgow, and Shetland. The number of votes and seats received were taken from each district's website: <<http://www.aberdeenshire.gov.uk/elections/local/index.asp>>, <[http://www.glasgow.gov.uk/en/YourCouncil/Elections\\_Voting/Election\\_Results/ElectionScotland2007/LGElectionResults.htm](http://www.glasgow.gov.uk/en/YourCouncil/Elections_Voting/Election_Results/ElectionScotland2007/LGElectionResults.htm)>, and <<http://www.shetland.gov.uk/elections/elections2007/results.asp>>.

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## Conclusions

Introducing a new voting system is no small feat. Scotland attempted to implement a ranked voting system alongside a standing mixed member system, and, despite overblown criticism in popular media, the election was overall a success for fair representation. The problems are easily correctable for future elections. Both the mixed member proportional system used to elect the Scottish Parliament and the choice voting system used to elect the Scottish local councils performed admirably in ensuring fairer political representation. Without MMP, Labour would have won a majority of seats in Parliament on barely a third of votes. Under choice voting, in the sample considered, well over four-fifths of voters helped elect their candidates of choice.

Most of the troubles associated with the MMP elections were in reality not the result of the electoral system in use, but were due to poor ballot design, an aspect of the election that can be easily remedied in time for the next vote. Error rates, moreover, were well below the 10% figure reported early in the media, with some 4% error in the party list vote and 3% in the candidate vote. As a point of comparison, voter error was more than 10% in some Florida counties in the 2000 presidential election.

The choice voting system used in the Scottish local council elections helped to increase the political participation of the populace through more candidates on the ballots and increased voter turnout. Since choice voting had never before been used in Scottish local elections, the low, single-digit rate of error demonstrates the system's ease of use. As the electorate becomes even more familiar with choice voting, the number of invalid ballots should fall below its already slim figure.