

Observations on the Close Minnesota Senate Election
Updated with Precinct Data

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Summary: Analysis of precinct-level election returns in Minnesota reveals a strong positive relationship between the vote for Barack Obama and the residual vote rate in the U.S. Senate contest between Norm Coleman and Al Franken.

NB: This memo supercedes a similar memo dated November 6, 2008. The current memo analyzes the residual vote rate in the Senate and presidential races, based on estimated precinct-level turnout data available on the Minnesota Secretary of State's web site.

The margin between incumbent Norm Coleman and challenger Al Franken in the Minnesota U.S. Senate race has been reduced to 206 votes and a recount is looming.¹ The question on everyone's mind is how likely would it be for a recount to overturn the results of the election?

The most likely source of an additional 207 votes for Franken is among the 34,700 ballots (of over 2.9 million) that did not record any vote for the U.S. Senate race. What is the likelihood of there being a net of 207 votes for Frank among these nearly thirty-five thousand ballots? We won't know until the recount happens, but there is at least one pattern in the "residual vote" that paints an optimistic picture for Franken.

First, some background. The data being analyzed here are from the Minnesota Secretary of State's web site (<http://electionresults.sos.state.mn.us/20081104/>). On the site is a downloadable file recording the election returns for all state races, including Senate and President. On this site there is also a report of "Statewide Precinct Reporting Statistics" that can be clicked through to access estimated turnout at the precinct level. The data analyzed here was updated, according to the web site, at 10:48 am this morning. Since then, the data have been updated again. Based on experience with the previous updates, it is unlikely that these small changes will affect the analysis that follows. Another piece of evidence that the election returns are changing in a non-parallel fashion is the fact that in 25 of the 4,130 precincts we have data for, there were more votes reported cast for president than total turnout reported. The number of votes reported being cast for Senate is greater than total turnout in 9 precincts. This is undoubtedly evidence that the election returns are being updated and posted separately from the turnout figures. Again, based on my experience in analyzing unfolding election returns like this, these small anomalies should not materially affect the analysis that follows.

The data set reports total turnout of 2,920,178. The number of votes cast for one of the presidential candidates (including write-ins) is 2,910,330; the number of votes cast for one of the

¹http://www.startribune.com/politics/national/senate/34200229.html?elr=KArksLckD8EQDUoaEyqyP4O:DW3ckUiD3aPc:_Yyc:aULPQL7PQLanchO7DiUX, accessed 10 Nov. 2008, 3:01pm.

senatorial candidates (including write-ins) is 2,885,500. This works out to 9,848 “residual votes”² in the presidential race and 34,678 residual votes in the senatorial contest.³ As a percentage of turnout, this is 0.34% in the presidential race and 1.19% in the senatorial race.

Table 1 reports the residual vote rates for the presidential and senatorial races in each county.

[Table 1 about here]

Figure 1 graphs the residual vote rate in the presidential election in each precinct against the turnout in each precinct. As the precinct gets bigger, the residual vote rate gets smaller, but that’s just an artifact of the higher variability of the residual vote rate among the smaller precincts. Notice that there are a few outliers along the way — precincts with significantly higher residual vote rates than other precincts of similar size. While this handful of precincts might warrant closer examination in a post-election audit, these do not represent many votes, out of the 4 million cast in over 4,000 precincts statewide.

[Figure 1 about here]

Figure 2 does the same, this time for the senatorial election. Compared to Figure 1, note that the residual vote rates across precincts is much more variable. Also note that the rate tends to tail up a bit among the bigger precincts. Finally, there are many more outlier precincts, compared to the presidential race, suggesting that there may be a number of precincts with an unusually large number of uncounted ballots.

[Table 2 about here]

Which are the precincts that seem to have an unusually large percentage of residual votes for Senate? One way to answer this question is simply to regress the residual vote percentage on the precinct turnout, and then to find the largest positive residuals from the regression.⁴ I have reported the largest positive outliers in Table 2, among the precincts with at least 100 voters. For instance, Eddy Township in Clearwater County had 50 residual votes among the 215 ballots cast in that precinct. This residual vote rate (23.3%) was 21.9% points higher than we would have predicted from the size of the precinct alone. Multiplying 21.9% times 215 gives us an estimate of 47.1 “extra” residual votes in this precinct, for the Senate election, compared to other

²By definition, the number of residual votes in a jurisdiction is the total turnout minus the number of votes cast for all candidates in the race being analyzed.

³In the November 6 memo, I estimated the residual vote rate would be around 40,000 ballots. The under-estimate was due to the fact that the residual vote rate in the presidential race was lower than what I had predicted (0.5%).

⁴For the non-technically-inclined reader, I apologize for using the word “residual” in two different contexts in one sentence. For the technically-inclined, I included the square of turnout, in addition to turnout itself, to account for any non-linearities in the relationship.

precincts of comparable size. Twenty-one precincts in Table 2 would seem to be good candidates for close scrutiny in the canvass and recount.

Figures 2 and 3 graph the residual vote rates in the presidential and senatorial races (respectively) against the percentage of the vote received by Obama in each precinct. Note that the relationship between the two is only slightly positive in Figure 2 (presidential election), but significantly positive in Figure 3 (Senate election).

[Figures 2 and 3 about here]

For reference, Table 3 reports the regressions. To help assure ourselves that the relationship is not being driven by unmeasured demographic or political characteristics that may influence voting in each county, the regular linear regressions are paired with regressions that include county fixed effects. The fixed effects don't change the substantive magnitudes of the slope coefficients for the Senate election, though they cause the sign of the relationship to flip in the presidential election.

We are focused on the Senate race. We can use the simple regression results to estimate average residual vote levels in the Senate race, given degrees of support for Obama. In a precinct that gave Obama only 10% of the vote, we would predict a residual vote rate of 0.35%. In a precinct that gave Obama 90% of the vote, we would predict a residual vote rate of 1.9%

Do Democratic areas always tend to produce more drop-off or residual votes than Republican areas, regardless of the election year? No. I conducted a similar analysis using data from the 2000 general election (not reported here) and found the following:

1. A statistically significant *negative* relationship between the residual vote rate in the senatorial contest and the percentage of the vote cast for the Democratic presidential nominee, Al Gore.
2. *No* relationship between the residual vote rate for President and the vote for Gore.

In other words, in 2000, the last time a Senate race appeared on the ballot in Minnesota in a presidential year, Democratic areas had *lower* residual votes for Senate.

Some may wonder whether there is a relationship between the method of counting ballots and the size of the residual vote rates. While some of Minnesota still hand-counts paper ballots (20,351 ballots in this election) and a few precincts use central-count optical scanning (13,256 ballots), 98% of ballots were counted using in-precinct optical scanning. Any differences between methods would not give us leverage in understanding the contours of the residual votes. Indeed, all three methods produced virtually identical residual vote rates in the senatorial race — 1.19% for precinct tabulation, 1.37% for central-count tabulation, and 1.20% for hand-counted ballots. In passing, it should be noted that there was a tremendous difference in the residual vote rate across methods in the presidential voting — 0.33% for precinct tabulation, compared to 0.91% for hand-counted paper and 1.08% for central-count ballots.

To conclude, there were more residual votes in Democratic areas in Minnesota. Because the bulk of ballots were counted using methods that should have “kicked out” ballots containing

over-votes, the residual votes we have been discussing are virtually all under-votes. In a recount, it will be ballots that are currently counted as under-votes that will contain votes that may end up being counted for one of the candidates — perhaps because of stray marks on the ballot, pencil marks too light to be registered by the scanners, etc. Because these ballots are disproportionately in Democratic precincts, it is reasonable to expect that a recount for Franken will, on net benefit him.

But, this is only an expectation. It is not unreasonable to imagine other scenarios such that Franken is not favored in a recount. For instance, more voters may have been conflicted between the two major (and one minor) candidates in more Democratic areas, meaning that the uncounted ballots are plain abstentions. But, we won't know until the recount is over.

Figure 1. Residual vote rate in presidential election against turnout at the precinct level.

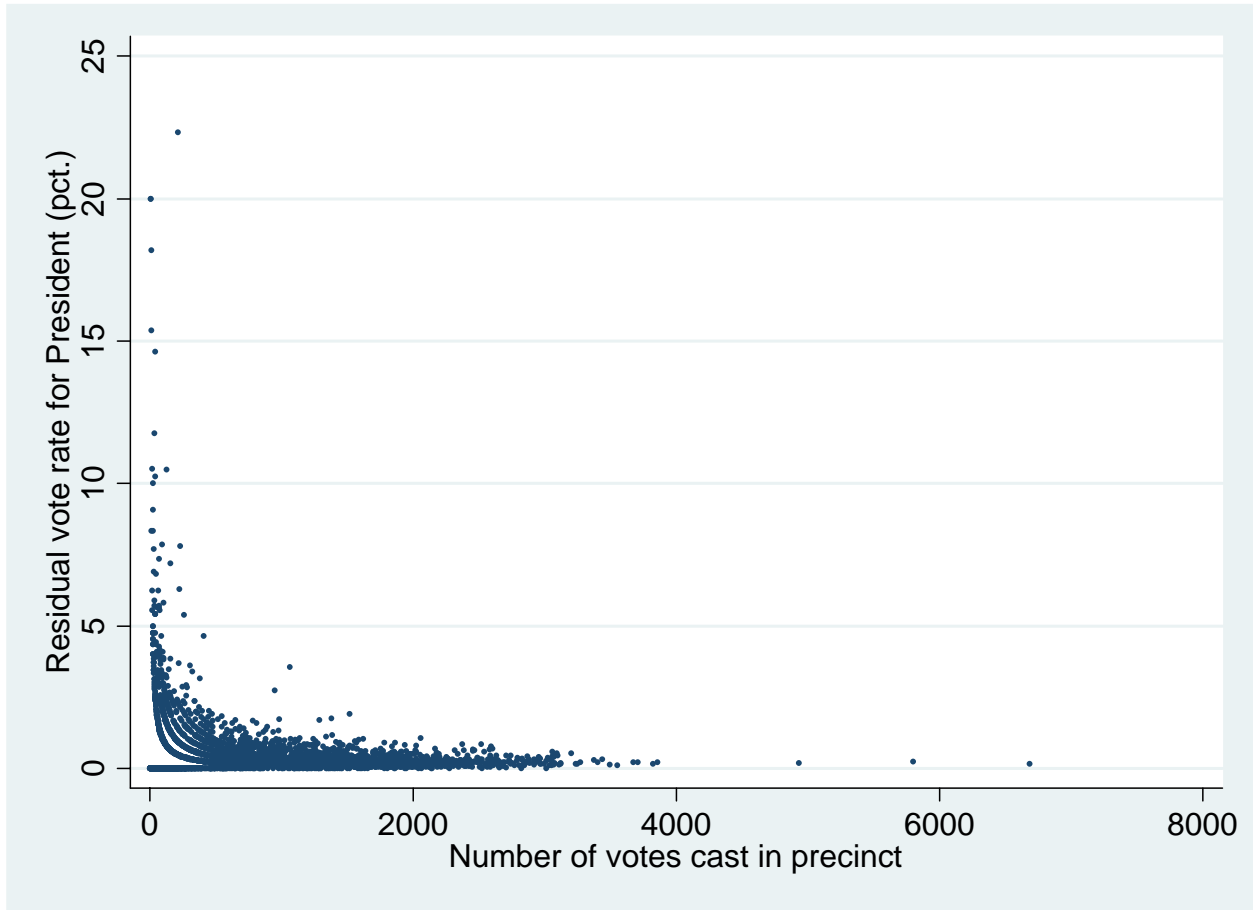


Figure 2. Residual vote rate in Senate election against turnout at the precinct level.

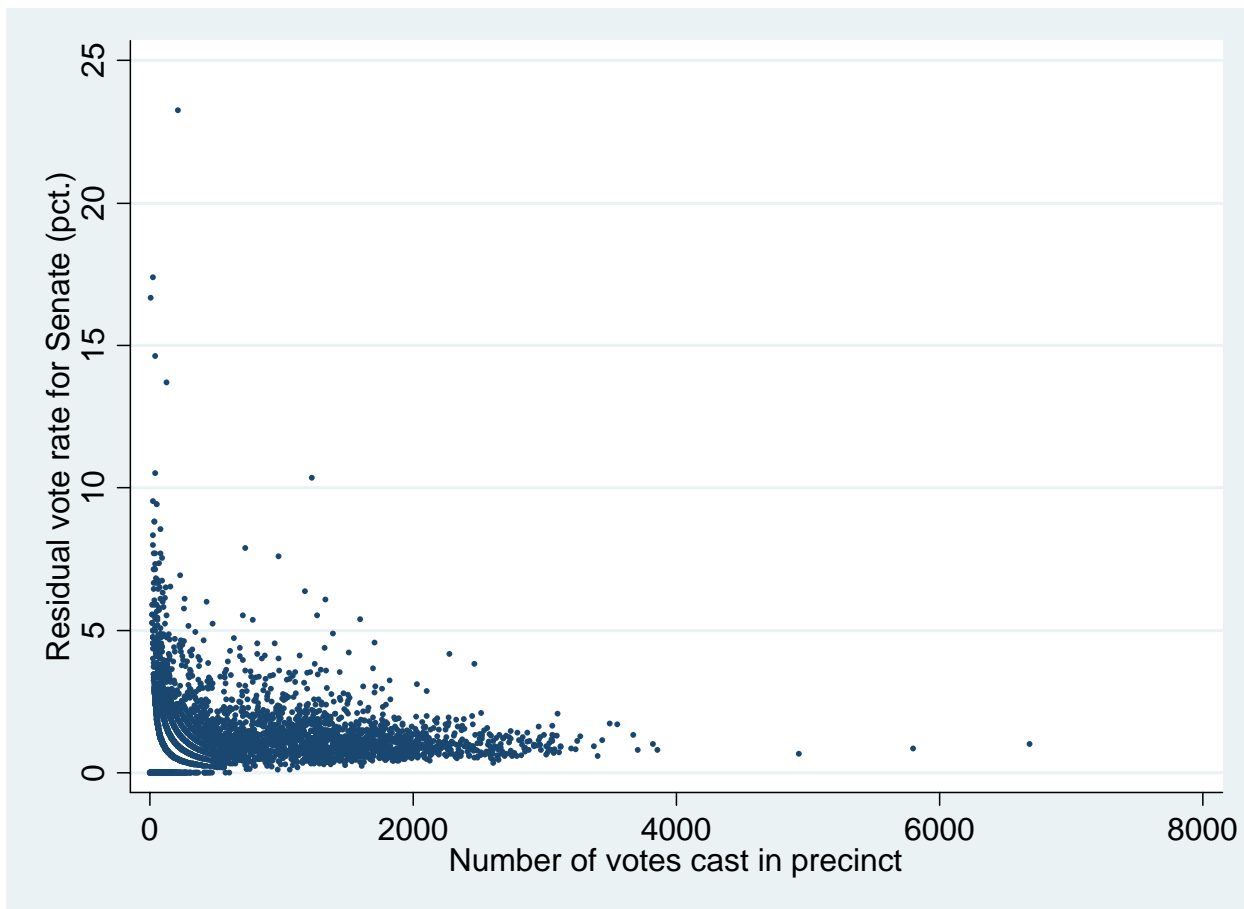


Figure 3. Residual vote rate in the presidential race against percentage of vote cast for Obama.

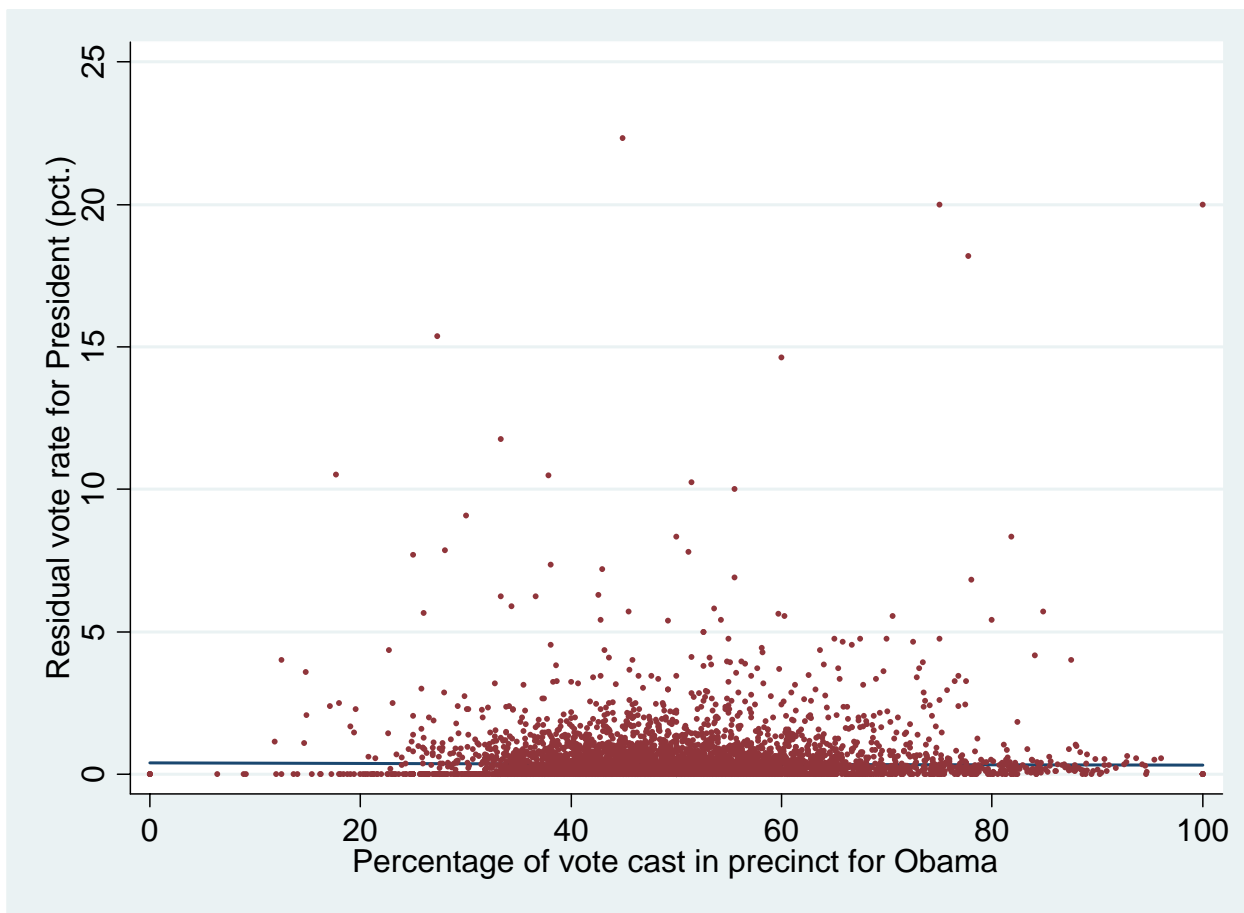


Figure 4. Residual vote rate in the senatorial race against percentage of vote cast for Obama.

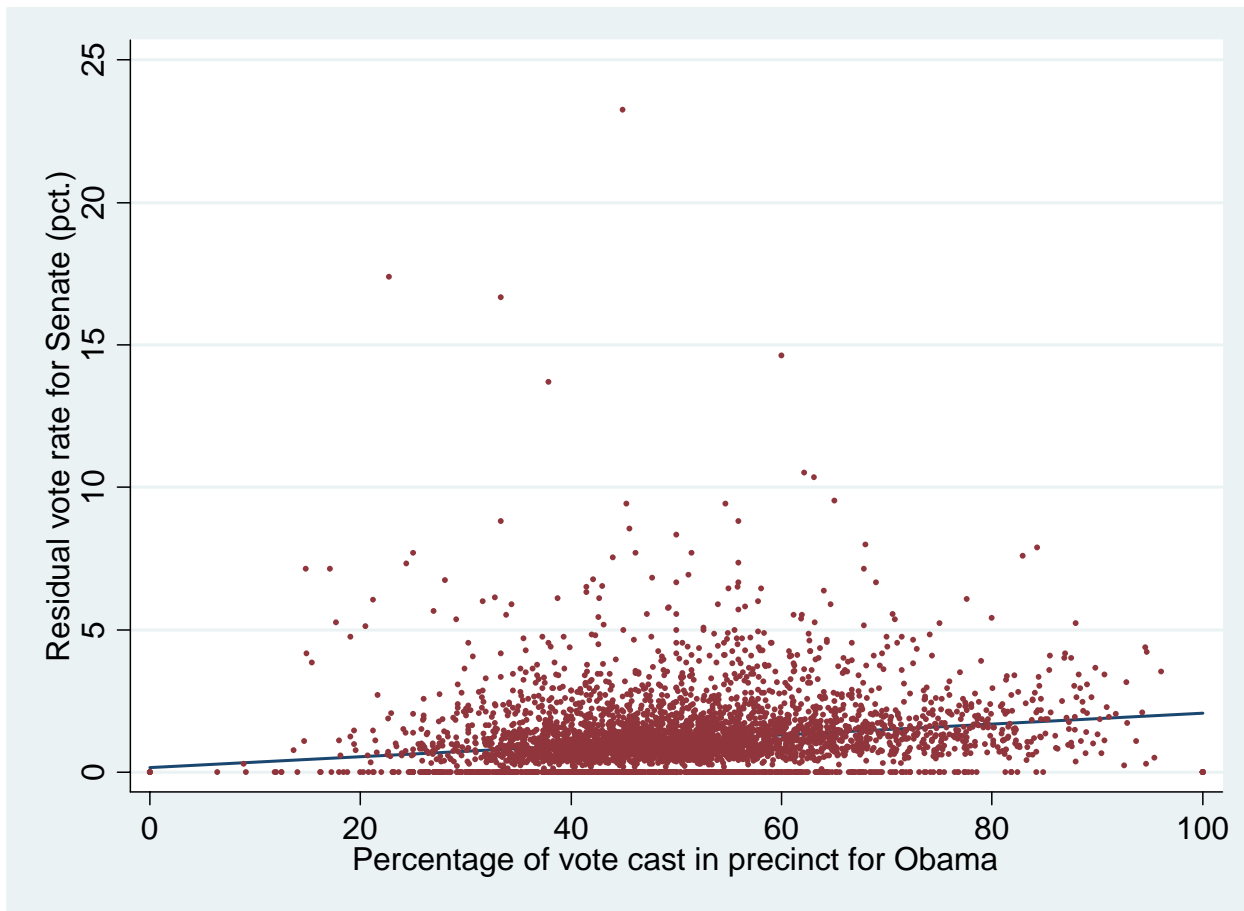


Table 1. Residual votes rate in Minnesota senatorial election

	Resid. Vote rate			Resid. Vote rate			Resid. Vote rate	
	Senate	Pres.		Senate	Pres.		Senate	Pres.
Aitkin	1.05%	0.48%	Isanti	0.91%	0.34%	Pipestone	2.21%	0.91%
Anoka	0.83%	0.18%	Itaska	1.09%	0.47%	Polk	1.76%	0.47%
Becker	1.33%	0.43%	Jackson	1.25%	1.25%	Pope	0.84%	0.64%
Beltrami	1.41%	0.35%	Kanabec	0.97%	0.45%	Ramsey	1.46%	0.28%
Benton	1.16%	0.47%	Kandiyohi	0.93%	0.42%	Red Lake	2.71%	1.26%
Big Stone	1.55%	1.09%	Kittson	1.96%	1.31%	Redwood	1.22%	0.57%
Blue Earth	1.35%	0.32%	Koochiching	1.61%	0.47%	Renville	0.93%	0.61%
Brown	0.96%	0.46%	Lac Qui Parle	1.33%	0.73%	Rice	1.55%	0.36%
Carlton	1.06%	0.44%	Lake	1.36%	0.40%	Rock	2.33%	0.78%
Carver	0.96%	0.24%	Lake Of The Woods	2.79%	0.64%	Roseau	1.51%	0.75%
Cass	1.07%	0.49%	Le Seur	0.72%	0.52%	Saint Louis	1.24%	0.55%
Chippewa	1.16%	0.64%	Lincoln	1.58%	1.04%	Scott	0.98%	0.27%
Chisago	0.90%	0.37%	Lyon	1.23%	0.51%	Sherburne	0.94%	0.28%
Clay	1.66%	0.25%	Mahnomen	1.65%	0.72%	Sibley	0.72%	0.46%
Clearwater	2.88%	1.66%	Marshall	1.53%	0.88%	Stearns	1.22%	0.34%
Cook	1.07%	0.42%	Martin	1.17%	0.41%	Steele	1.07%	0.53%
Cottonwood	1.18%	0.79%	McLeod	0.83%	0.50%	Stevens	0.90%	0.46%
Crow Wing	1.13%	0.38%	Meeker	0.85%	0.52%	Swift	0.93%	0.57%
Dakota	0.91%	0.20%	Mille Lacs	1.15%	0.49%	Todd	1.21%	0.45%
Dodge	1.26%	0.39%	Morrison	1.03%	0.64%	Traverse	1.70%	1.12%
Douglas	1.04%	0.45%	Mower	1.47%	0.60%	Wabasha	1.15%	0.59%
Faribault	1.19%	0.59%	Murray	1.50%	1.13%	Wadena	1.16%	0.88%
Fillmore	1.40%	0.47%	Nicollet	1.12%	0.22%	Waseca	0.70%	0.44%
Freeborn	1.46%	0.51%	Nobles	1.89%	0.82%	Washington	0.92%	0.19%
Goodhue	0.89%	0.41%	Norman	1.96%	1.27%	Watsonwan	1.11%	0.70%
Grant	0.91%	0.66%	Olmsted	1.64%	0.22%	Wilkin	2.03%	0.93%
Hennepin	1.22%	0.25%	Otter Tail	1.09%	0.48%	Winona	2.86%	0.37%
Houston	2.55%	0.64%	Pennington	1.78%	0.50%	Wright	0.82%	0.26%
Hubbard	1.12%	0.57%	Pine	1.02%	0.70%	Yellow Mead	0.77%	0.57%

Table 2. Senate election residual vote outliers.

County	Precinct #	Precinct name	Turnout	Residual pct.	Residual ballots from regression
Clearwater	35	Eddy Twp	215	21.9	47.1
Wilkin	50	Breckenridge Twp.	124	12.4	15.3
Winona	195	Winona W-3 P-1	1228	9.1	112.0
Ramsey	670	St. Paul W-1 P-14	723	6.6	47.7
Ramsey	1230	St. Paul W-5 P-08	975	6.3	61.8
Pine	5	Arlone Twp.	231	5.6	12.9
Marshall	90	Excel Twp.	153	5.2	7.9
Lake	65	Stony River Twp.	123	5.1	6.3
Winona	175	Winona W-2 P-1	1179	5.1	60.5
Rice	105	Northfield W-3 P-1	1333	4.9	64.9
Beltrami	160	Moose Lake Twp	114	4.8	5.4
Nobles	45	Ellsworth	262	4.8	12.5
Olmsted	185	Rochester W5 P2	433	4.7	20.3
Nobles	55	Grand Prairie Twp.	100	4.6	4.6
Lac Qui Parle	30	Boyd	103	4.5	4.6
Freeborn	190	Newry Twp.	260	4.4	11.5
Clay	190	Moorhead City W-3 P-2	1270	4.3	54.6
Olmsted	160	Rochester W4 P1	707	4.2	29.9
Stearns	260	St Cloud W1 P1	1600	4.2	67.2
Lake Of The Woods	15	15 - 2-A Gudrid Unorg	127	4.2	5.3
Winona	210	Winona W-3 P-4	784	4.1	32.0

Table 3. Regressions predicting residual vote rates in the presidential and senatorial race (weighted by turnout in the precinct, excluding precincts with more votes counted than reported turnout).

	Presidential race		Senatorial race	
	No fixed effects	Fixed effects	No fixed effects	Fixed effects
Obama pct.	-0.00093 (0.00054)	0.0017 (0.0007)	0.019 (0.001)	0.024 (0.001)
Intercept	0.40 (0.30)	0.26 (0.04)	0.16 (0.05)	-0.076 (0.063)
N	4,094	4,094	4,094	4,094
R ²	.08	.16	.095	.24