A Test of the Ranking Assumption Using the 2006 Senate Races

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This note is an addendum to Ray C. Fair, “Interpreting the Predictive Uncertainty of Presidential Elections,” September 2006. It tests the ranking assumption using the Intrade (i.e., Tradesports) data and the actual outcomes of the 2006 U.S. Senate races. It assumes that the earlier paper has been read, which is available on the website listed in the footnote.

Table 1 presents the last transaction price and the average of the bid and ask prices as of 6:00 AM on election day, November 7, 2006, for the seven states that were at all in play. Even for these seven states trading was thin, which is the reason for presenting both the last transaction price and the average of the bid and ask prices. The separate bid and ask prices are also presented to get a sense of the market. The states are ranked in the table by the last transaction price.

The ranking assumption says that the Democrats should not lose any state ranked above a state they won, and this was the case for the 2006 Senate races. The lowest ranked state that they won was Virginia (Virginia ranks lowest using

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Table 1
Intrade Prices at 6:00 AM on November 7, 2006
The Prices are for a Democratic Win for the Senate

<table>
<thead>
<tr>
<th>State</th>
<th>Average of Bid &amp; Ask</th>
<th>Average of Bid</th>
<th>Average of Ask</th>
<th>Last</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 New Jersey</td>
<td>87.8</td>
<td>92.3</td>
<td>90.5</td>
<td>94.0</td>
</tr>
<tr>
<td>2 Montana</td>
<td>79.9</td>
<td>78.8</td>
<td>75.0</td>
<td>82.6</td>
</tr>
<tr>
<td>3 Rhode Island</td>
<td>76.0</td>
<td>65.8</td>
<td>63.5</td>
<td>68.0</td>
</tr>
<tr>
<td>4 Maryland</td>
<td>70.2</td>
<td>72.5</td>
<td>71.0</td>
<td>74.0</td>
</tr>
<tr>
<td>5 Missouri</td>
<td>56.9</td>
<td>59.4</td>
<td>57.2</td>
<td>61.5</td>
</tr>
<tr>
<td>6 Virginia</td>
<td>53.5</td>
<td>55.0</td>
<td>54.0</td>
<td>56.0</td>
</tr>
<tr>
<td>7 Tennessee</td>
<td>12.0</td>
<td>15.0</td>
<td>12.0</td>
<td>18.0</td>
</tr>
</tbody>
</table>

- The Democrats won all but Tennessee.

either measure), and they won everything above Virginia. So as was the case for
the 2004 Presidential election, the ranking assumption is perfect!

It is also the case that Intrade is perfect in the sense that the Democrats won
every state with a price above 50 and no state with a price below 50. As noted
in the earlier paper, Intrade does not have to be perfect in order for the ranking
assumption to be perfect. For example, if the Democrats had lost Virginia, the
ranking assumption would still have been perfect, but not Intrade.

A widely traded contract on Intrade was one that stated that the Republicans
would retain control of the Senate. This would have happened had the Republicans
taken one of the first six states in Table 1 plus Tennessee (which according to
Intrade was not close). Under the ranking assumption the price of this contract
should have been 46.5, one minus the price for Virginia (using the last price).
Under the assumption that the probabilities of the first six states are independent
(and everything else certain), the price of the contract should have been 88.6, one
minus the product of the six probabilities (using the last prices). The actual price
at 6:00 AM was 66.4 using the last price and 67.2 using the average of the bid and ask prices (bid was 66.4, ask was 67.9). So the market price was almost exactly halfway between the ranking assumption price and the independence assumption price. The actual price is consistent with the independence assumption for Missouri and Virginia and certainty otherwise. In this case the price should have been 69.6, one minus the product of the two probabilities (using the last prices), which is close to the actual.

For the 2004 Presidential election the prices of the various combination contracts were very close to what the ranking assumption predicted they should be and not close to what the independence assumption predicted they should be. It looked like the Itrade market was using the ranking assumption in pricing the contracts, which with hindsight was accurate since the ranking assumption in 2004 was perfect. As just noted, the Itrade market did not do this for the 2006 Senate-control contract. It, of course, should have, since the ranking assumption was also perfect in 2006. Those who ignored the ranking assumption and bought the contract (assuming, say, independence for Missouri and Virginia) lost!

To end on a cautionary note about the use of the Itrade data, a colleague of mine who will go unnamed and who is a big fan of the ranking assumption tried to short the Senate-control contract on the night before the election and was not allowed to do so because he could not use his credit card. Because of a recently passed U.S. law, it is now more difficult for people to participate in markets like Itrade. This is probably not the reason the Senate-control contract was misspriced, since the bid/ask spreads in Table 1 are not large enough to overturn the above calculations, but in general the Itrade prices need to be interpreted now with more caution.