Appendix to A Comparison of Theoretical and Empirical Evaluations of the Borda Compromise

by William V. Gehrlein and Florenz Plassmann

1. Description of the ERS data set

The full ERS data set contains ballots from 84 elections that were administered by the *Electoral Reform Society* (ERS) as well as three elections from another source, all tabulated by Nicolaus Tideman in 1987 and 1988. For 29 of these elections we have only a subsample of the ballots; because we are not confident that these are random subsamples, we decided it would be prudent to exclude these elections from the analysis. This leaves us with 58 elections with between 3 and 26 candidates for which we have all ballots. For each of these 58 elections, we consider all combinations of three candidates, which yields a total of 18,169 three-candidate elections with between 1 and 1,957 voters and a mean of 59.9 voters. Because elections with too few voters contain too much noise, we restrict our analysis to so-constructed three-candidate elections for which we have at least 50 ballots. Our final ERS data set consists of 3,239 three-candidate elections with between 50 and 1,957 voters and a mean of 285.3 voters.

Because many voters ranked only a subset of the candidates in many of the ERS elections, the ERS data have somewhat different characteristics than our two primary data sets. While we did not include the analysis of the ERS data set in our main paper to avoid any bias that might result from such incomplete rankings, we show below that the results that we obtained from these data are very similar to those that we obtained from our analysis of the PB data.

The elections from which we assembled the three-candidate ERS elections contain an even wider range of candidates (3 – 26) than both the PB data (3 – 20) and the ANES data (3 – 12). The top part of Table A1 (which complements Table 2 in the paper) shows that the mean number of candidates is very close to that of the PB elections. The bottom part of Table A1 indicates that the distribution of voting situations in the ERS data is also much more similar to those of the PB data than the ANES data. Hence our assembled three-candidate ERS elections

have considerably more consistency among voters' preferences, thus reflecting a greater level of group mutual coherence, than the elections that we assembled from the ANES surveys.

Table A1. Properties of the ERS data

	ERS	
Candidate range	3 – 26	
Unweighted candidate mean	9.76	
Number of constructed three-candidate elections	3,239	
Maximum of *b**, *t**, *c**:		
*b**	1,327	40.96%
*t**	1,478	45.63%
*c**	253	7.81%
Ties	181	5.59%
Total	3,239	
Minimum of *b*, *t*, *c*:		
b	1,273	39.30%
t	1,255	38.74%
c	354	10.92%
Ties	357	11.02%
Total	3,239	

2. Analysis of the PB data set and the ERS data set

Figures A1 through A6 show the Condorcet efficiencies that we determined from the voting situations simulated with the model that we calibrated with the PB data. As implied by the results shown in Table 2 in the paper, the PB data reflect a very high level of group mutual coherence and there are relatively few voting situations for which parameters *c* and *c** are relevant. Not surprisingly, the theoretical Condorcet efficiencies and those that we determined from the simulated voting situations for parameters *c* and *c** are quite different, most notably for NPR. As expected, the Condorcet efficiencies are considerably larger than those that we determined from the simulated ANES voting situations. However, we observe the same general patterns that we observe with the theoretical Condorcet efficiencies and those established from

the ANES voting situations. NPER still performs poorly for larger values of parameter *b* and smaller values of *b**, while PER does the same for larger values of parameter *t* and smaller values of *t**. The Condorcet efficiency of BR remains consistently high over the ranges of all parameters. Thus despite the significant degree of group mutual coherence that is inherent in the PB data, this analysis also suggests the Borda Compromise.

Figures B1 – B6 show the Condorcet efficiencies that we determined from the voting situations simulated with the spatial model that we calibrated with the ERS data. The results are very similar to those that we obtained from the PB elections, with two notable differences. First, for parameter *c*, the ERS elections are more similar to the theoretical values in Figure 3a, in that the Condorcet efficiencies for PR, NPR, and BR do not converge to 1 as they do for both the ANES and the PB elections. However, unlike the theoretical Condorcet efficiencies for *c*, the Condorcet efficiencies of the simulated ERS elections are decidedly non-monotonic. Second the Condorcet efficiencies of NPR for *b** have a clear maximum for the ANES and the PB elections but they reach a plateau for the ERS elections. In all other respects, however, the Condorcet efficiencies that we determined from the ERS elections are very similar to those that we assembled from the PB elections. Hence, our analysis of the ERS elections supports the validity of the Borda compromise as well.

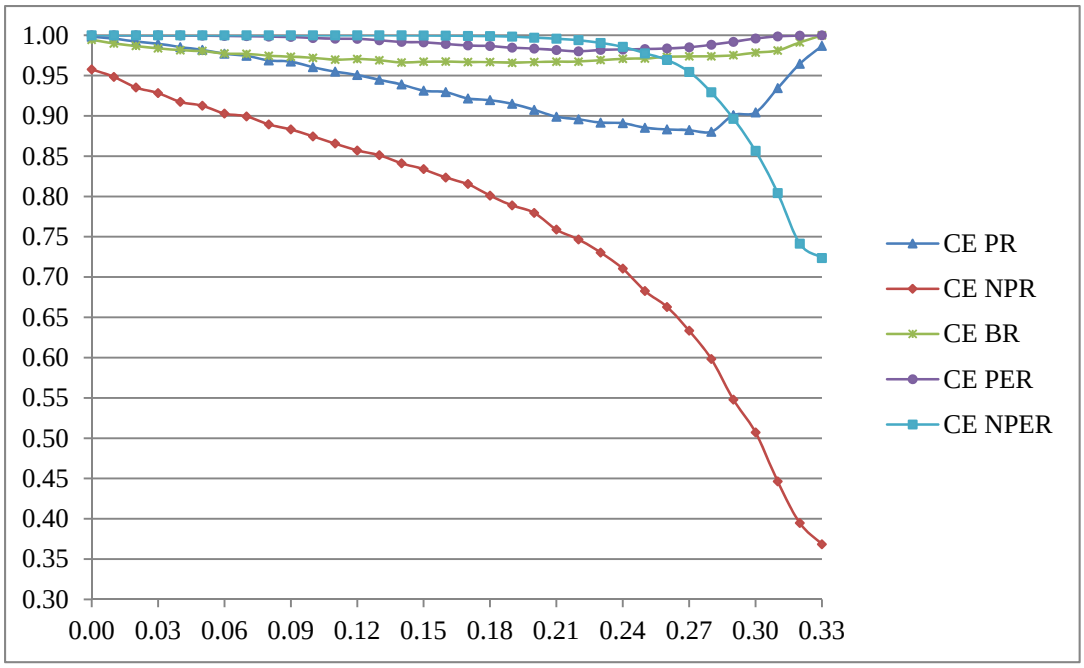


Figure A1. Simulated PB Condorcet Efficiency values of five voting rules for Parameter *b*.

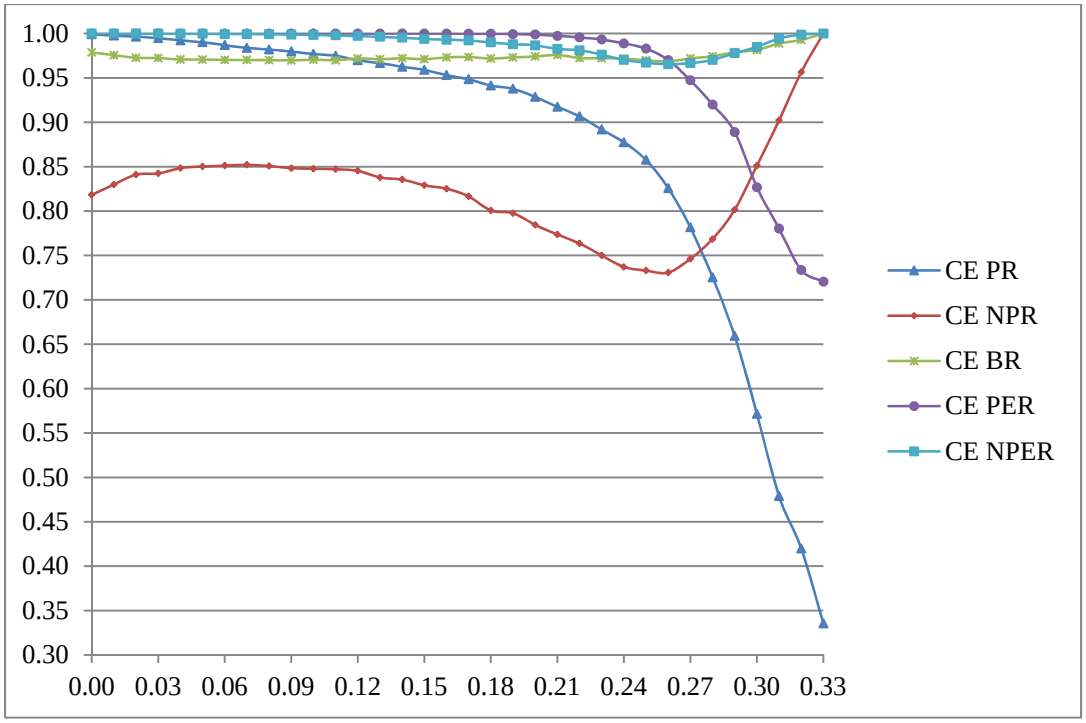


Figure A2. Simulated PB Condorcet Efficiency values of five voting rules for Parameter *t*.

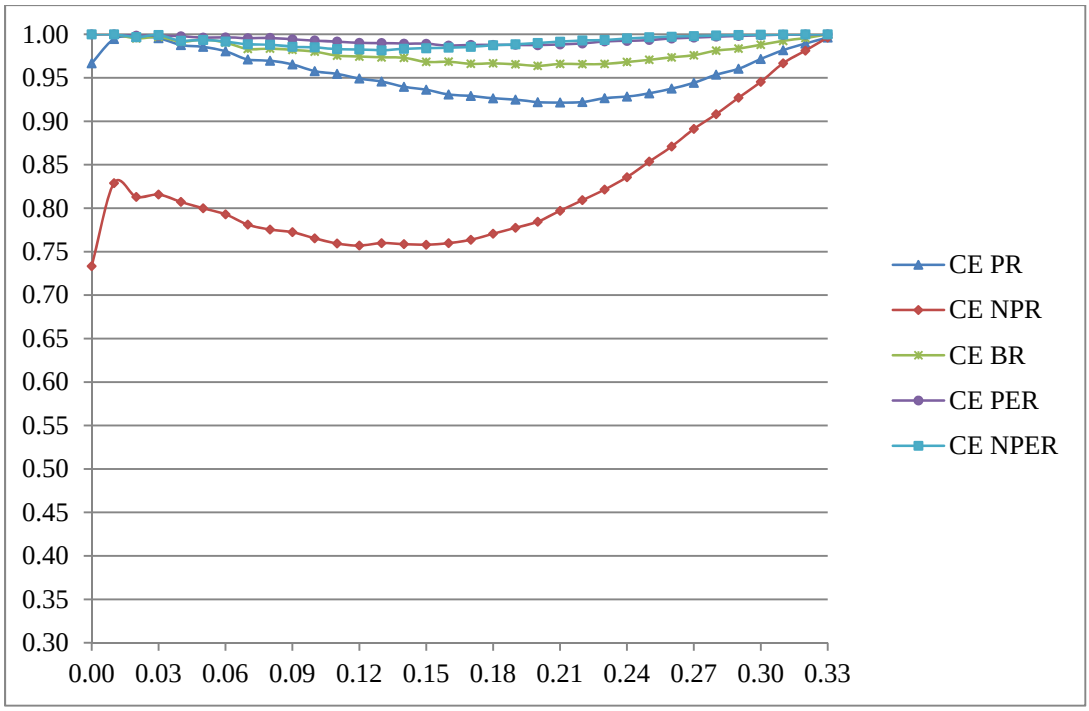


Figure A3. Simulated PB Condorcet Efficiency values of five voting rules for Parameter *c*.

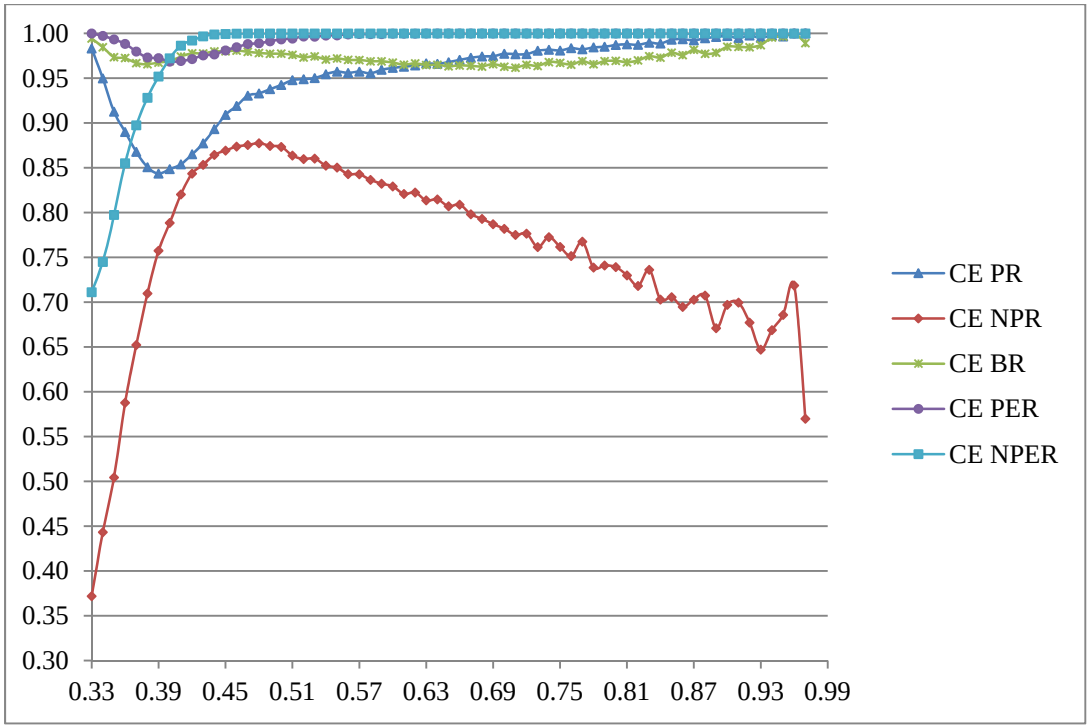


Figure A4. Simulated PB Condorcet Efficiency values of five voting rules for Parameter *b**.

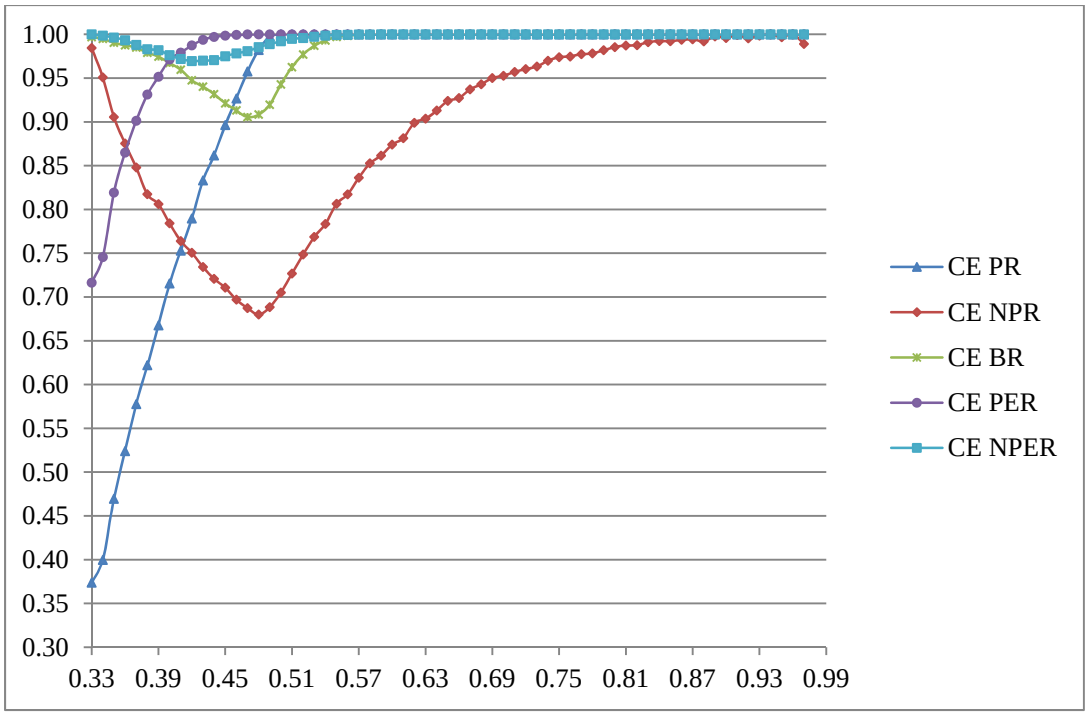


Figure A5. Simulated PB Condorcet Efficiency values of five voting rules for Parameter *t**.

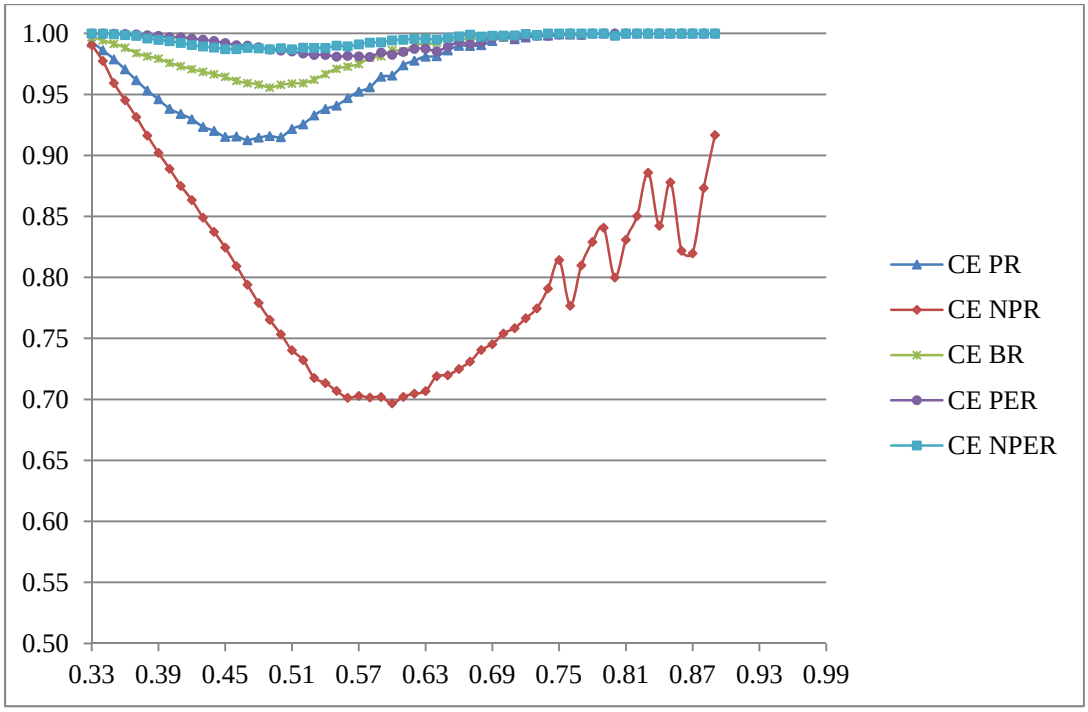


Figure A6. Simulated PB Condorcet Efficiency values of five voting rules for Parameter *c**.

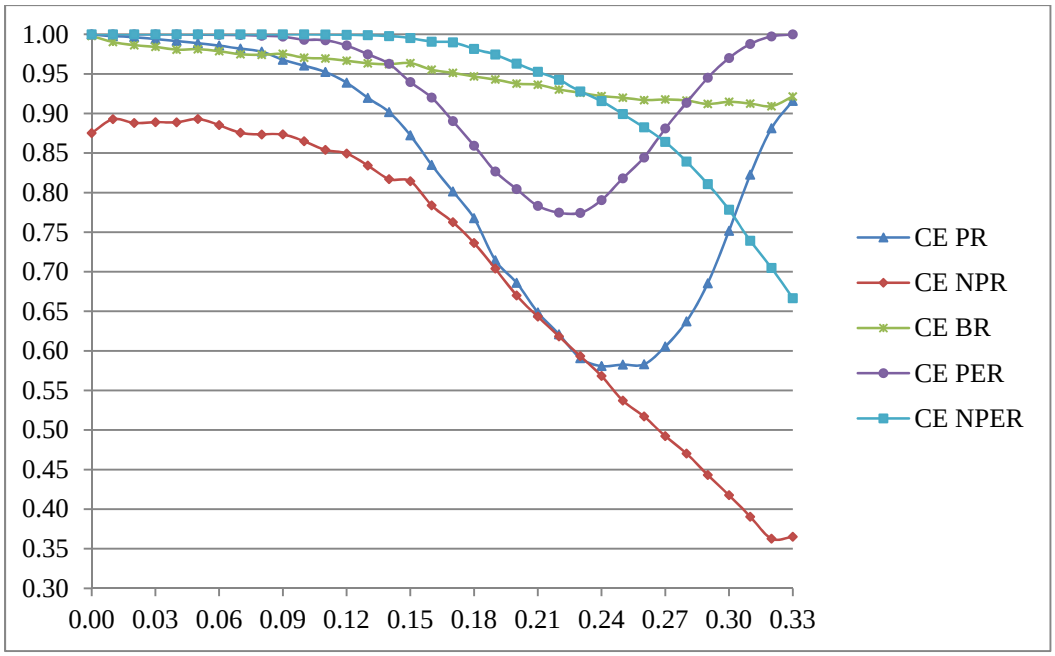


Figure B1. Simulated ERS Condorcet Efficiency values of five voting rules for Parameter *b*.

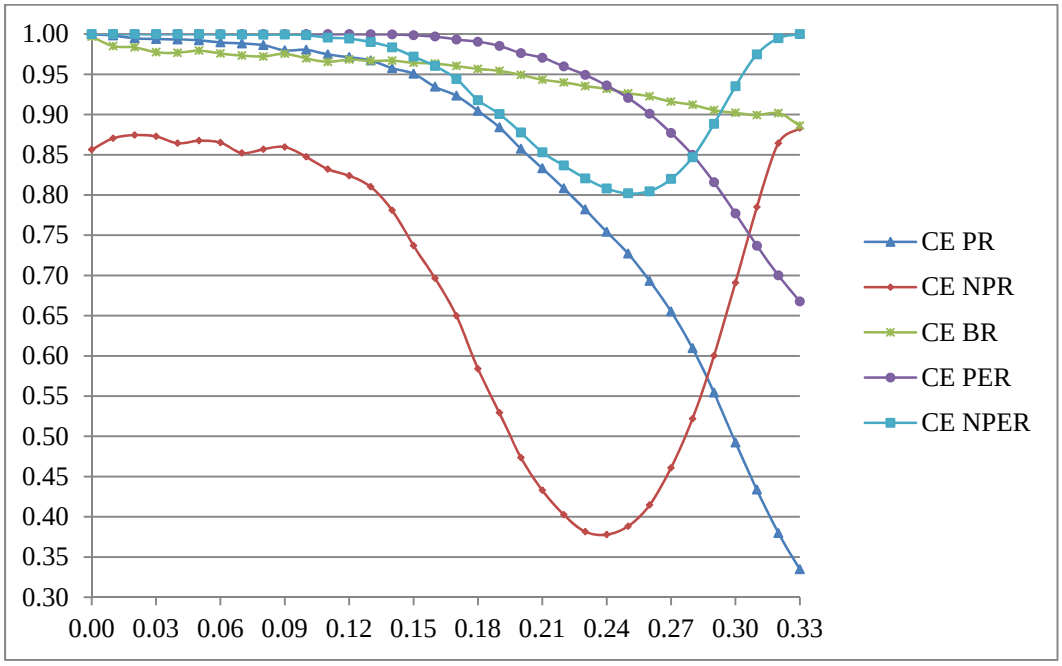
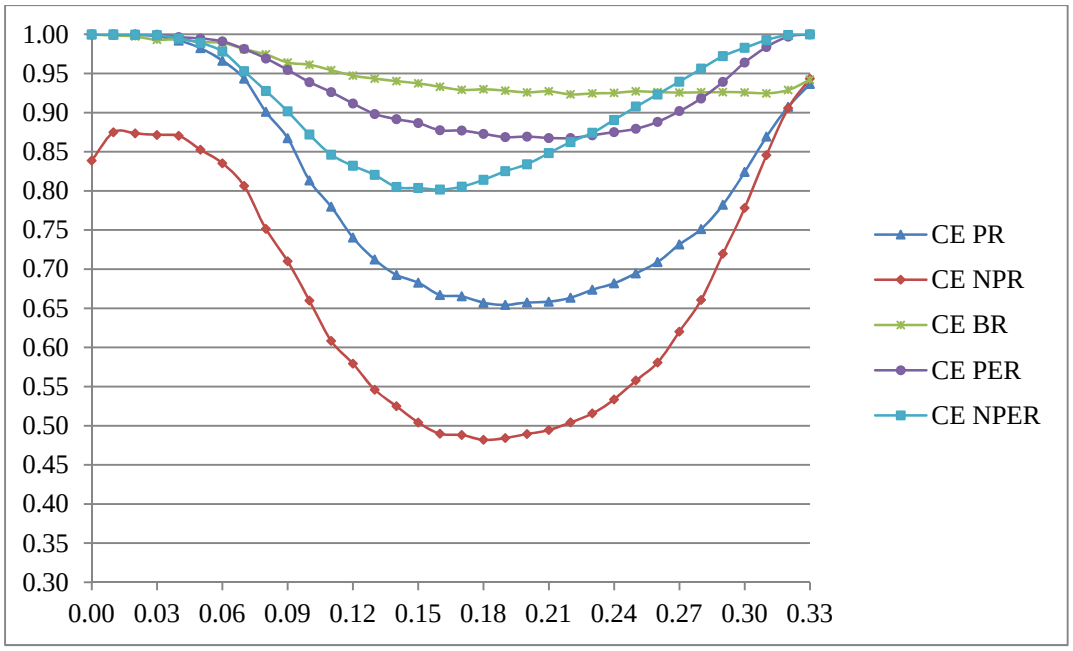


Figure B2. Simulated ERS Condorcet Efficiency values of five voting rules for Parameter *t*.



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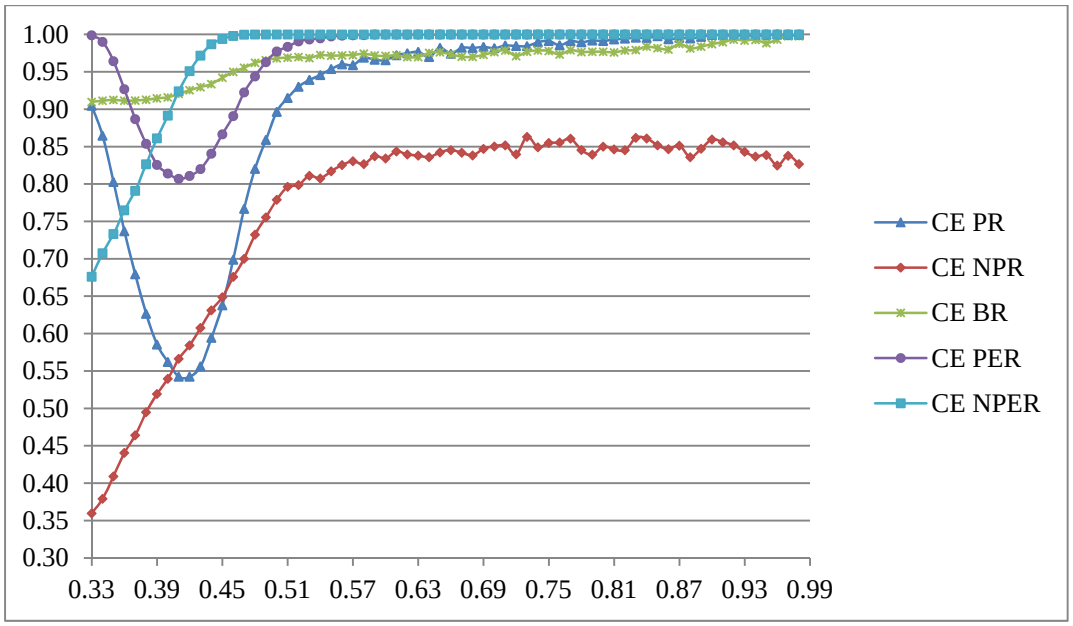

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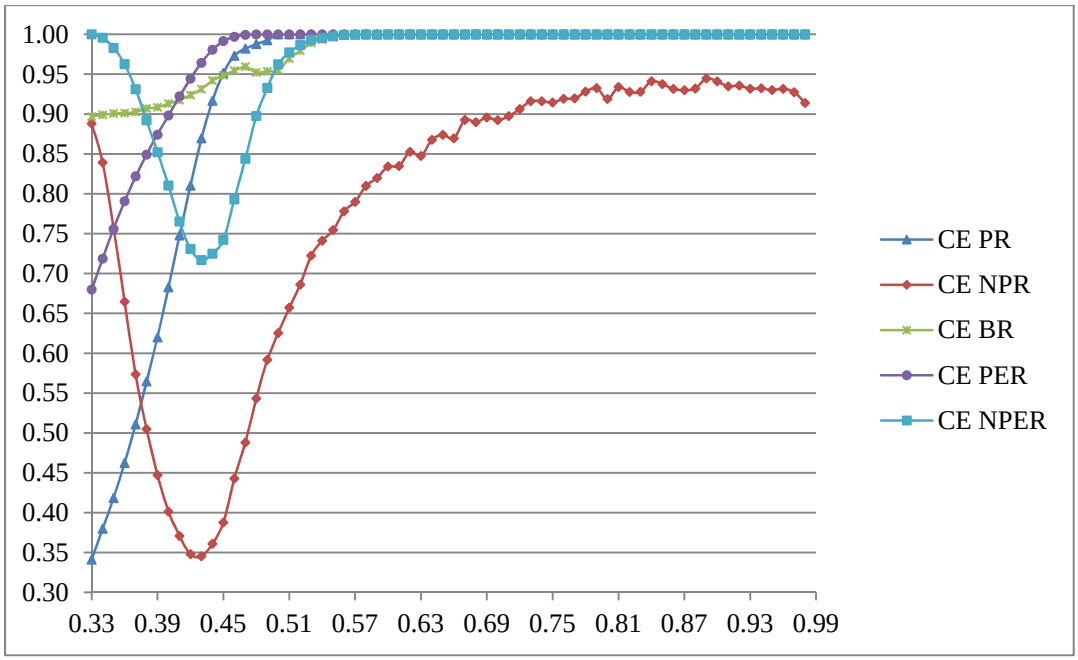

Figure B5. Simulated ERS Condorcet Efficiency values of five voting rules for Parameter *t**.

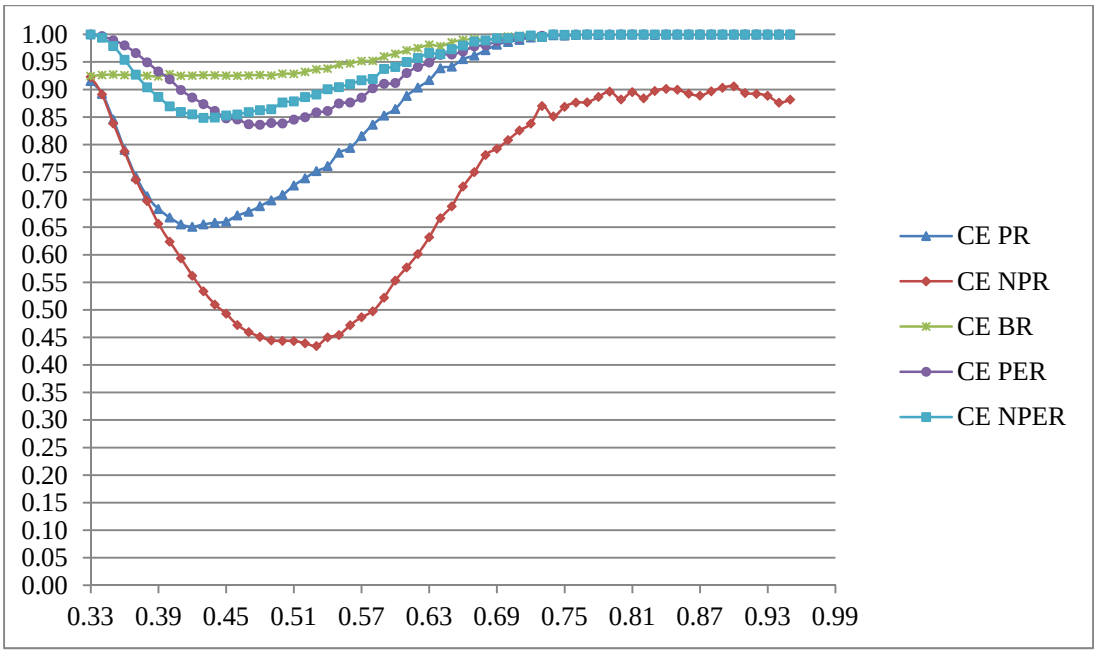

Figure B6. Simulated ERS Condorcet Efficiency values of five voting rules for Parameter *c**.