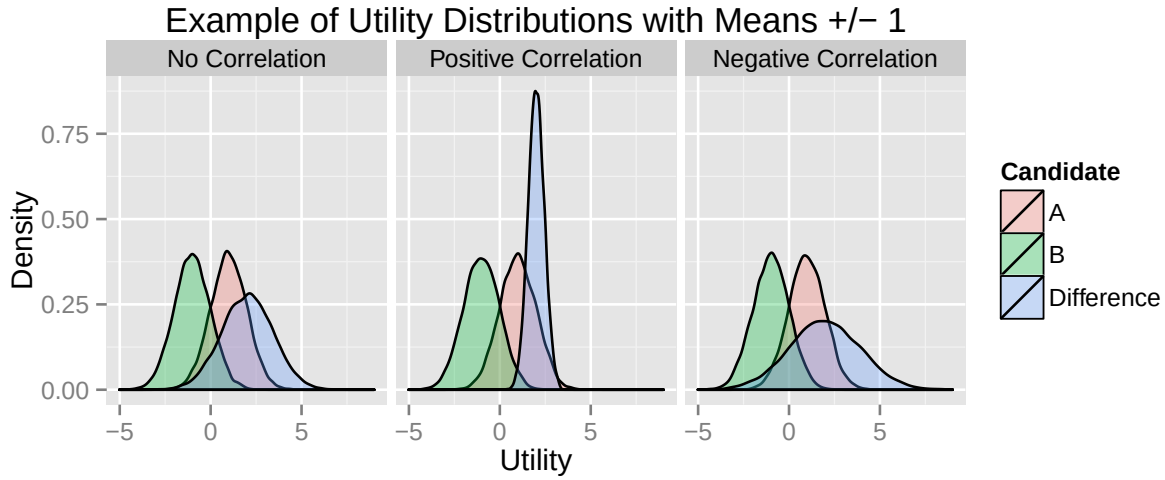
Comparison of the Efficiency of Majority Election Results

April 18, 2014

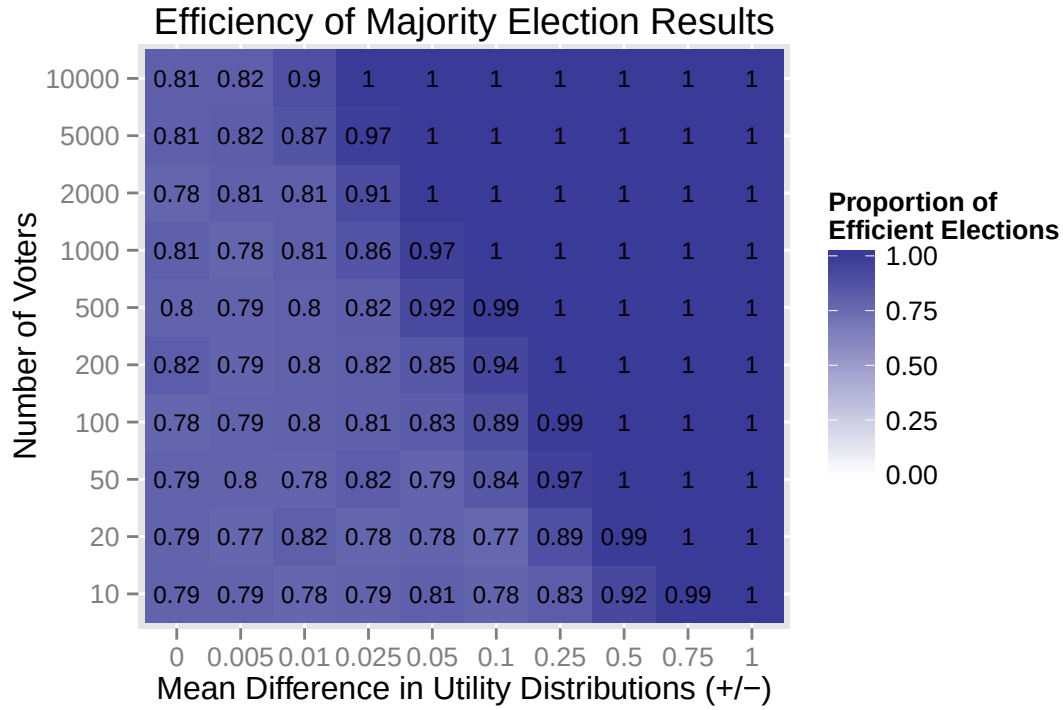
Overview of Simulation Parameters

- Number of simulations for each scenario: 1000
- Numbers of voters: 10, 20, 50, 100, 200, 500, 1000, 2000, 5000, 10000
- Utility distributions for each voter (candidates A and B):
  $\begin{pmatrix} U_A \\ U_B \end{pmatrix} \sim \mathcal{N}\left(\boldsymbol{\mu} = \begin{pmatrix} 0+\epsilon \\ 0-\epsilon \end{pmatrix}, \boldsymbol{\Sigma} = \begin{pmatrix} 1 & \sigma^2 \\ \sigma^2 & 1 \end{pmatrix}\right)$
- Differences in distribution means (ϵ): 0, 0.005, 0.01, 0.025, 0.05, 0.1, 0.25, 0.5, 0.75, 1
- Correlations between utilities (σ^2): 0, 0.9, -0.9
- Skewness of distribution (α): 0, 10, -10

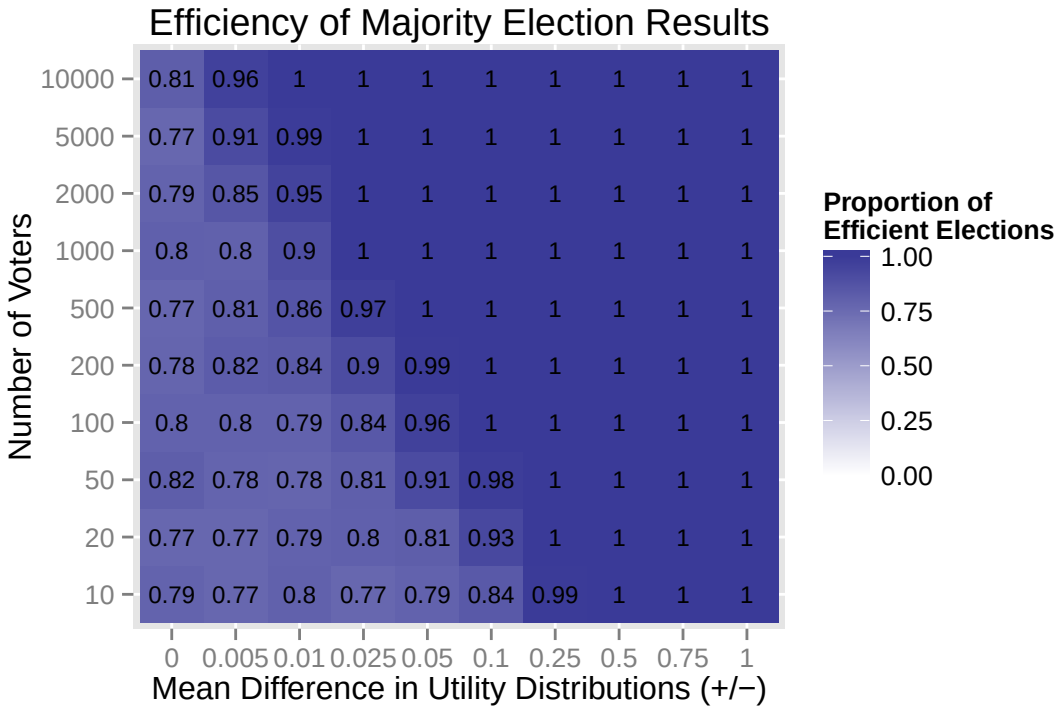
1 Normally Distributed Utilities (no skewness)



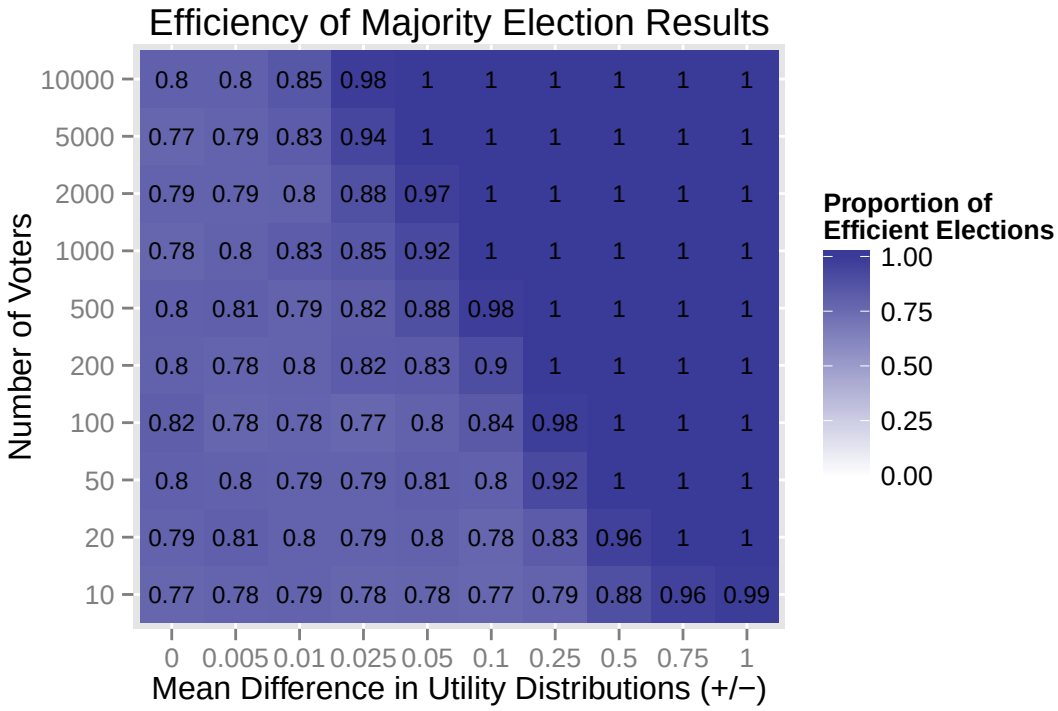
1.1 No Correlation Between Utilities



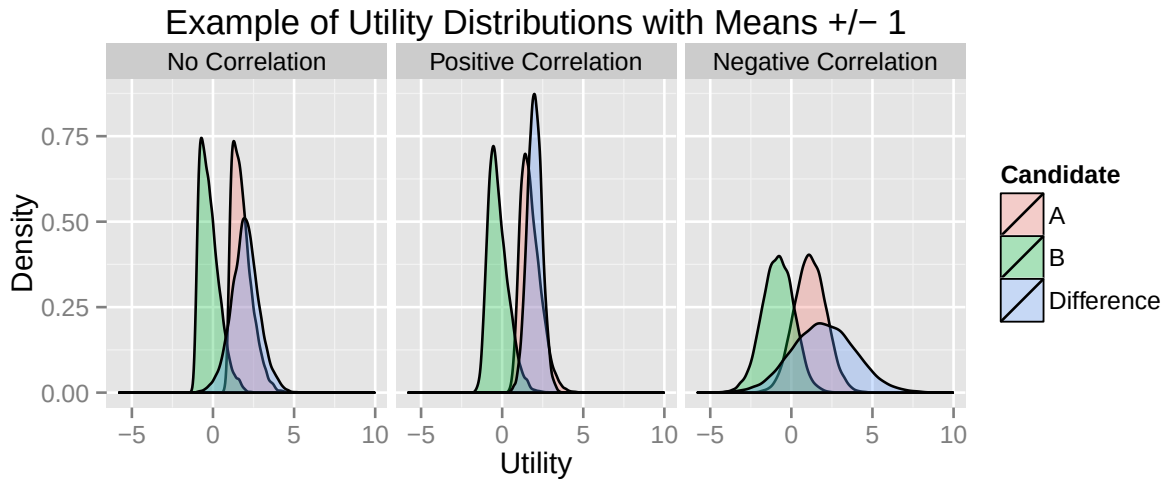
1.2 Positive Correlation Between Utilities



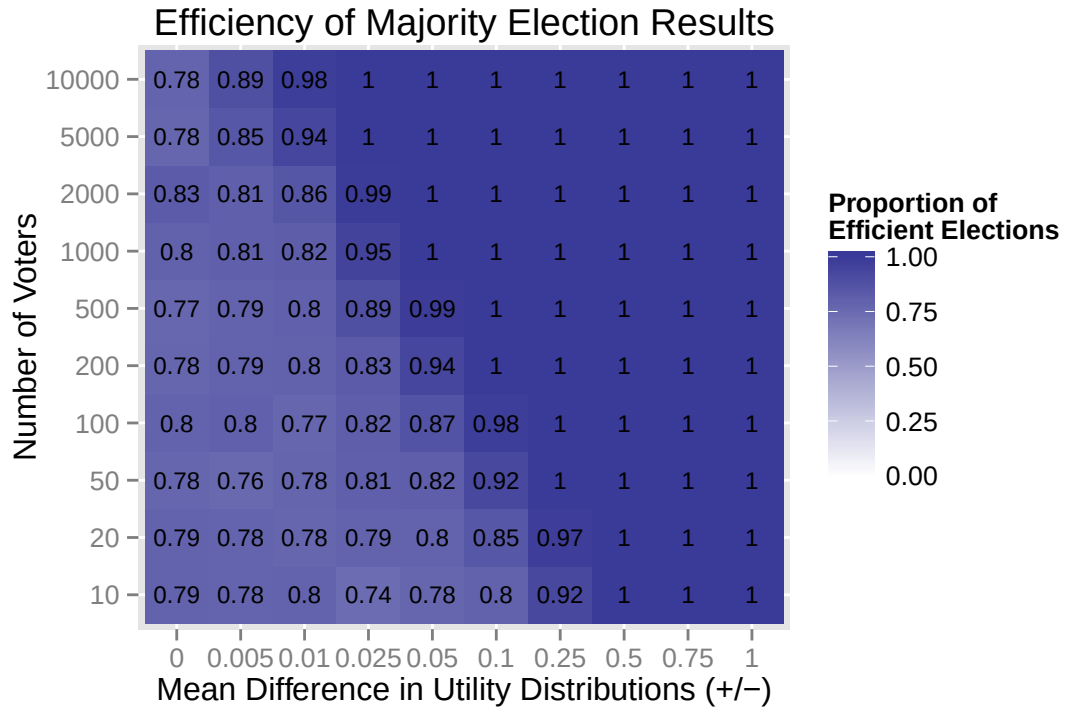
1.3 Negative Correlation Between Utilities



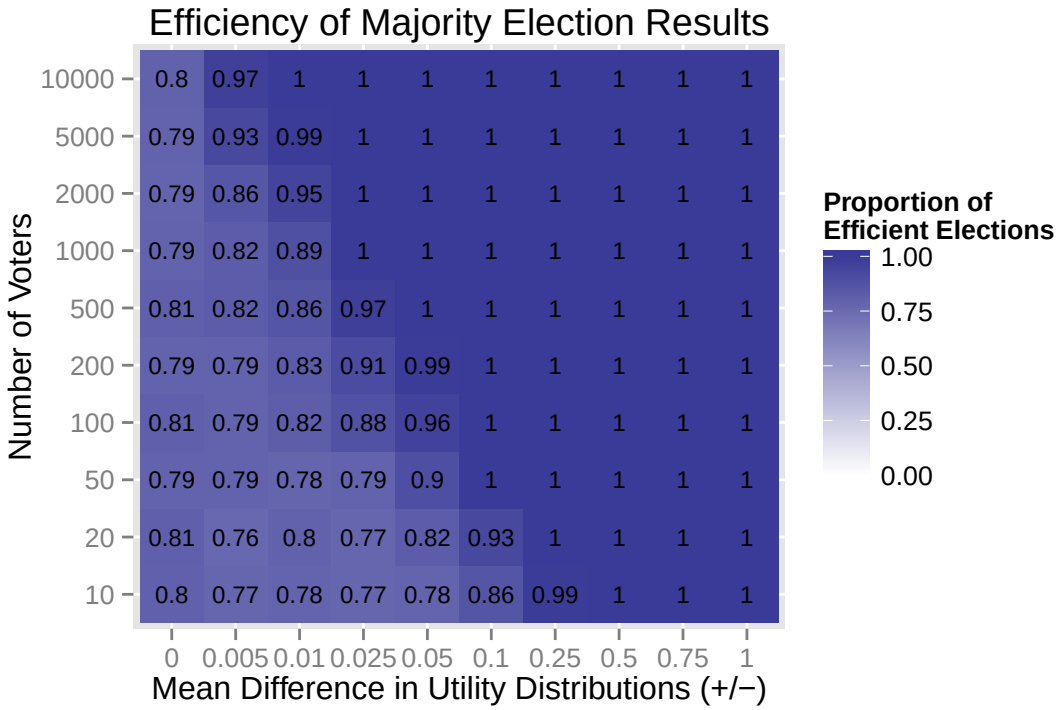
2 Positively Skewed Utilities



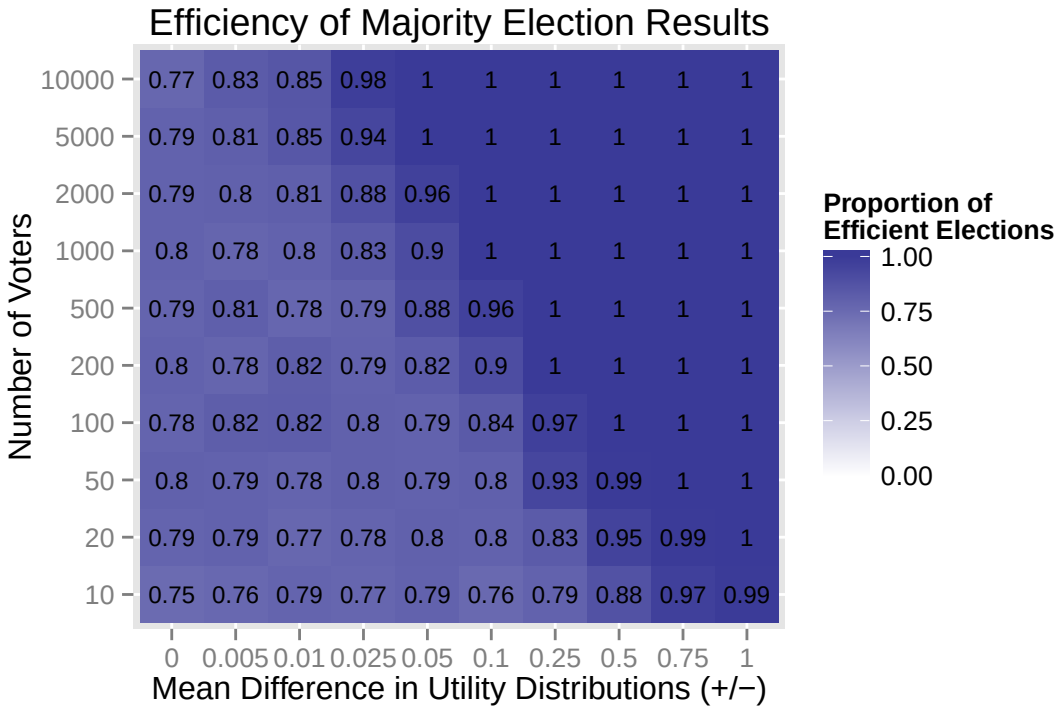
2.1 No Correlation Between Utilities



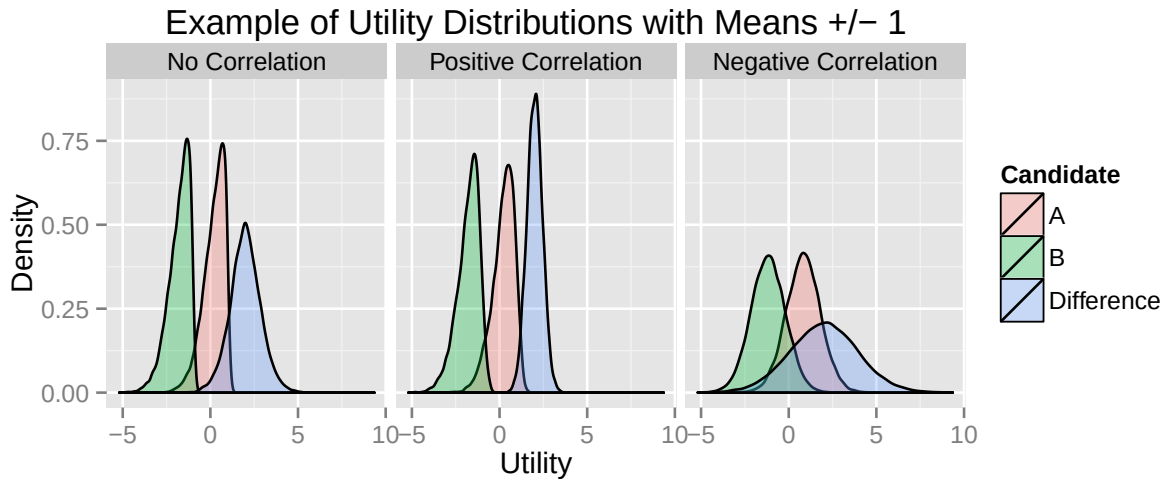
2.2 Positive Correlation Between Utilities



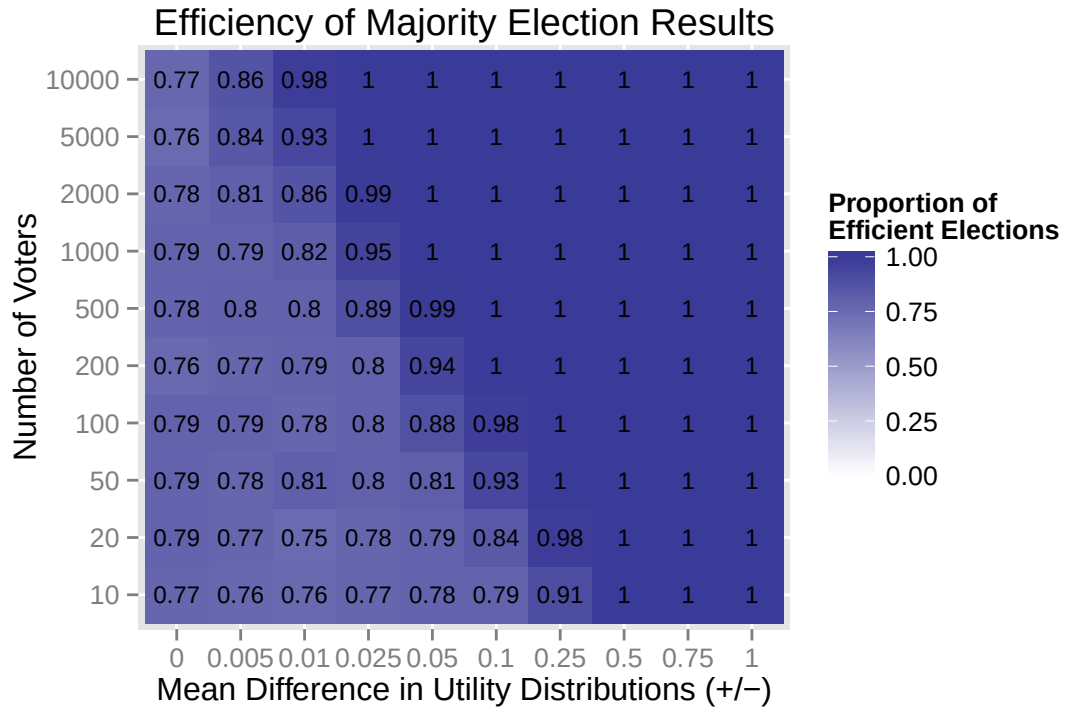
2.3 Negative Correlation Between Utilities



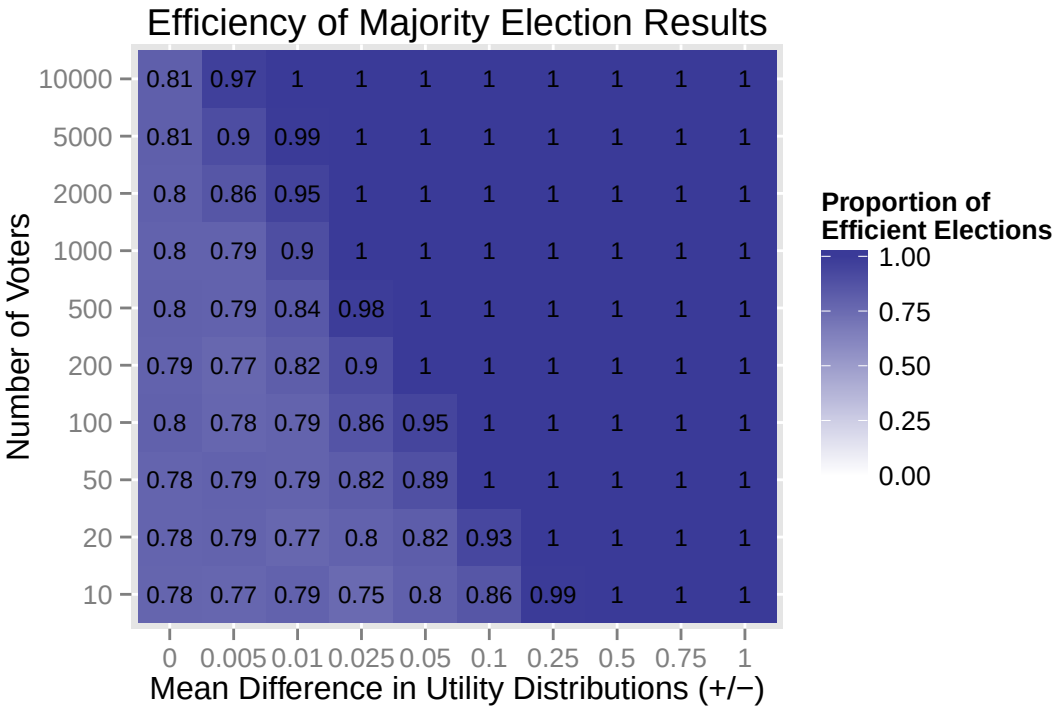
3 Negatively Skewed Utilities



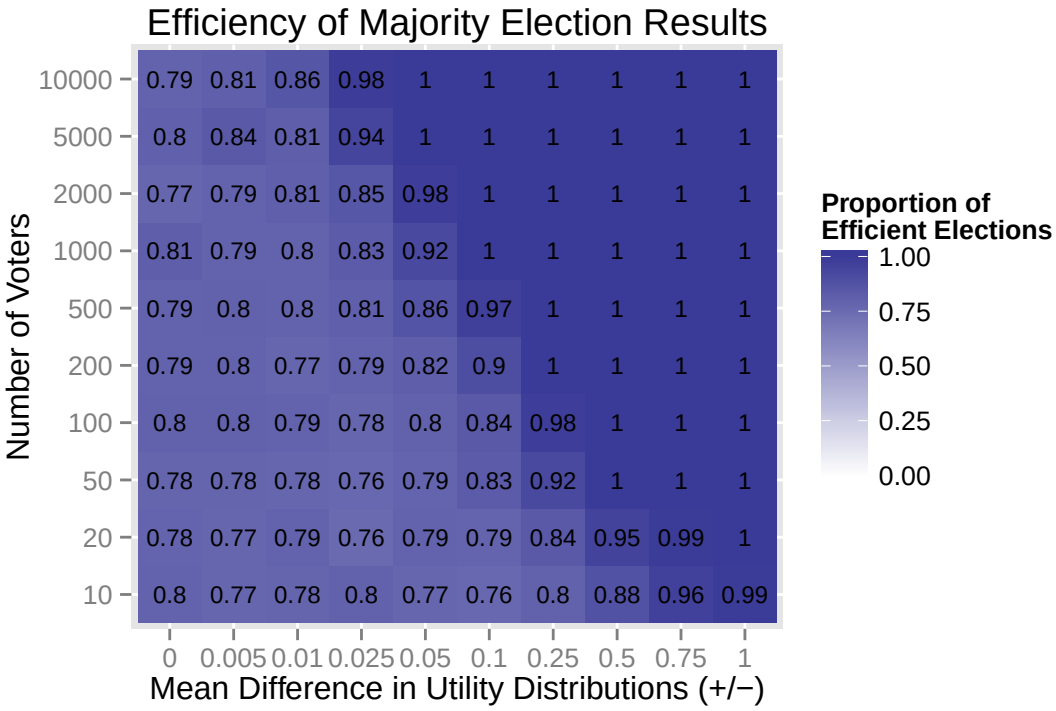
3.1 No Correlation Between Utilities



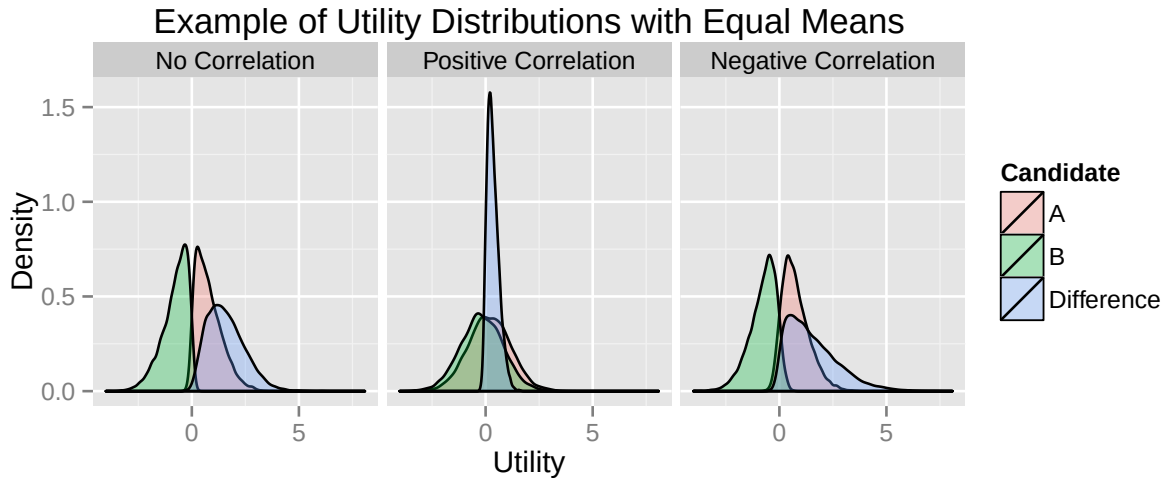
3.2 Positive Correlation Between Utilities



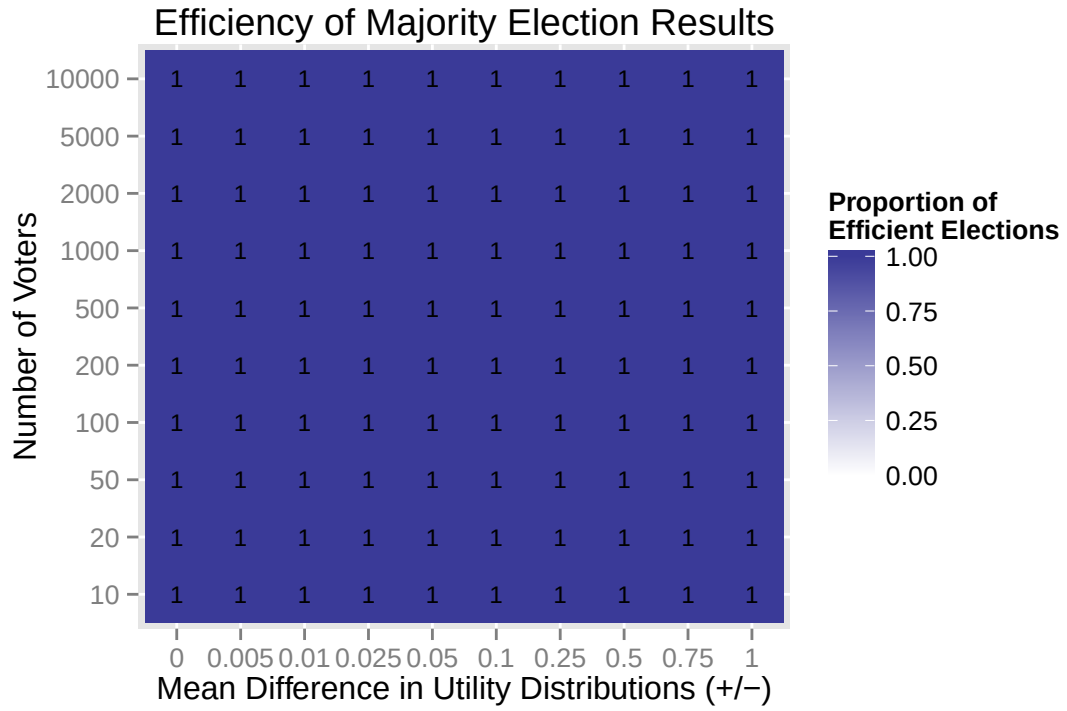
3.3 Negative Correlation Between Utilities



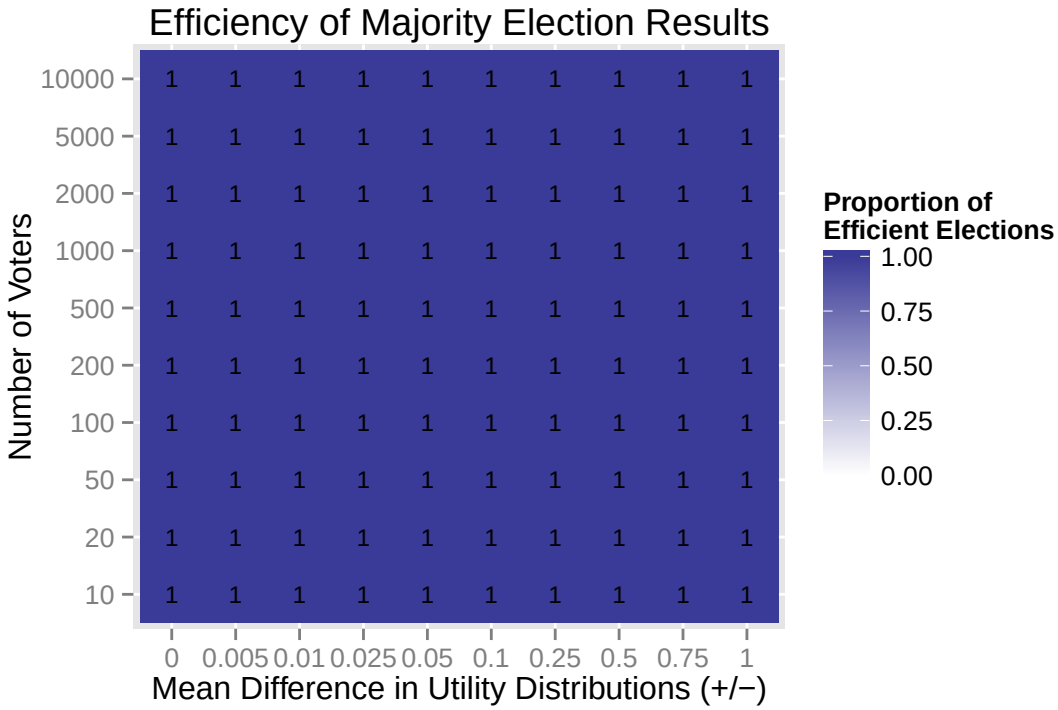
4 Utilities with Opposing Skewness: Positive Skew for Favored Candidate



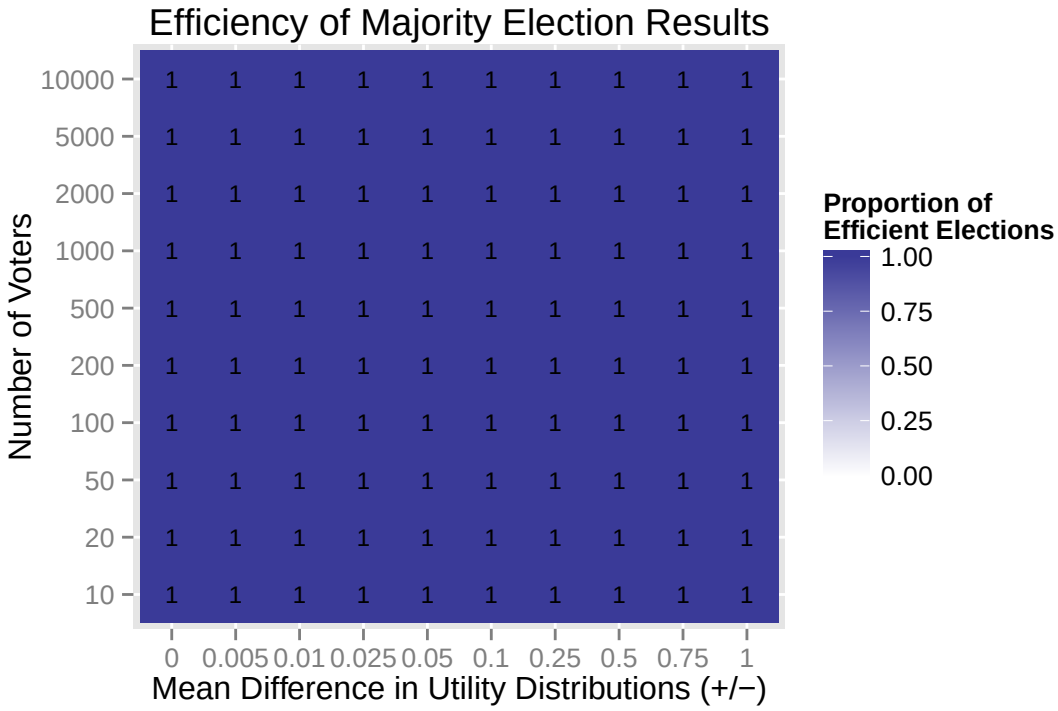
4.1 No Correlation Between Utilities



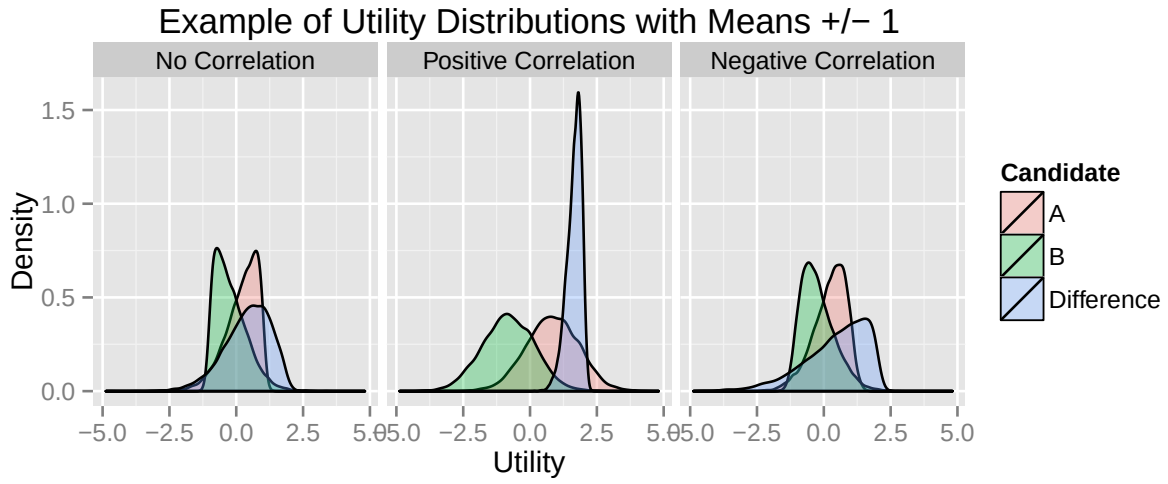
4.2 Positive Correlation Between Utilities



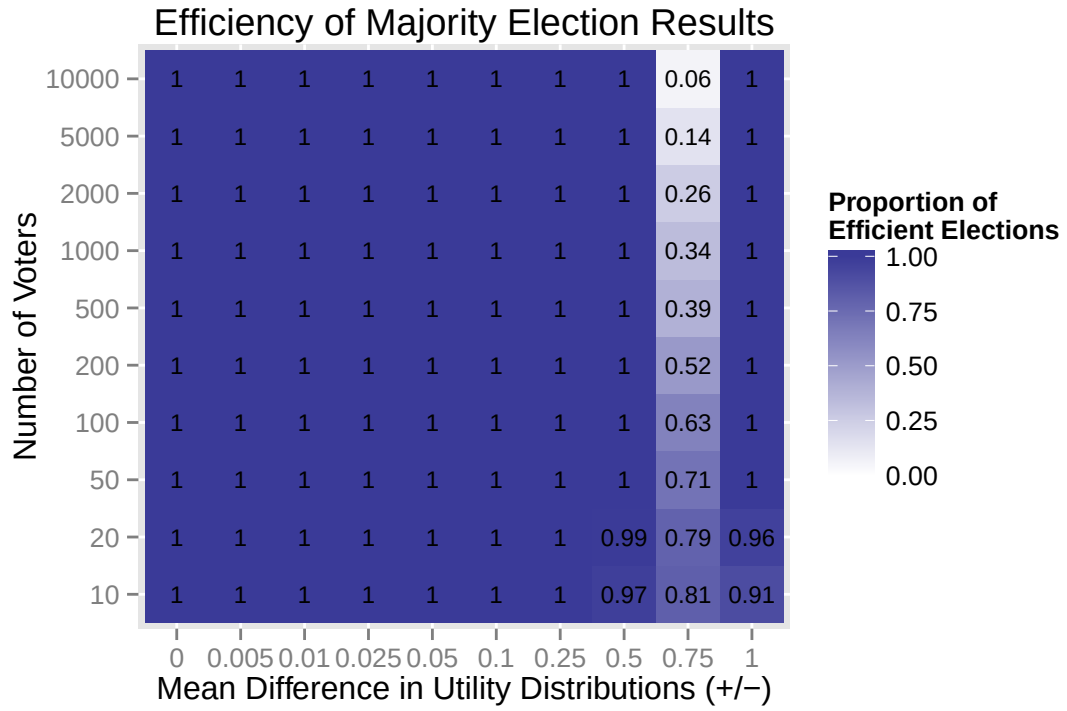
4.3 Negative Correlation Between Utilities



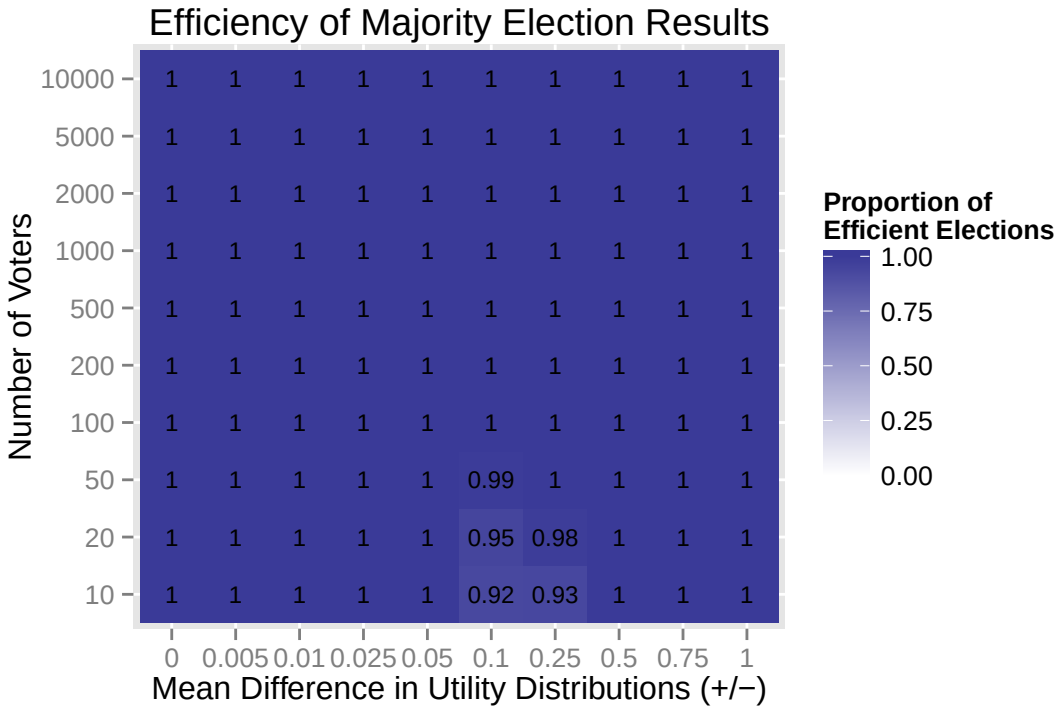
5 Utilities with Opposing Skewness: Negative Skew for Favored Candidate



5.1 No Correlation Between Utilities



5.2 Positive Correlation Between Utilities



5.3 Negative Correlation Between Utilities