

The optimization problem(s):

$$E[U_I(J, x_J)] = (r - x_J) \left(\int_0^{\frac{x_J+c}{r}} f^J(q) dq \right) + \int_{\frac{x_J+c}{r}}^1 (r(1-q) - c) f^J(q) dq$$

Where:

$J \in \{A, H, L\}$ is the “bargaining subgame”

x_J is the parameter to optimize: offer made to opposition

q is the probability the opposition wins conflict

$f^J(q)$ is the prior/posterior belief about q in the relevant subgame

r is the value of holding office

c is the cost of conflict

Let x_J^* be the solution to the J subgame, $\pi_J^* = \int_{\frac{x_J^*+c}{r}}^1 f^J(q) dq$ be the probability of conflict in the J subgame. Substantively we are interested in the value of holding an election:

$$\Delta_U^* = p(E[U_I(W, x_W^*)]) + (1-p)(E[U_I(L, x_L^*)]) - E[U_I(A, x_A^*)]$$

and the impact of the election on the probability of conflict:

$$\Delta_\pi^* = p\pi_W^* + (1-p)\pi_L^* - \pi_A^*.$$

(Usually) no explicit solutions, so let \mathbb{R} do some thinking for us!