PS 1514: Exam 3

Name:

Show all your work. No proof, no points.

1 Corner Solution (5 Points)

The game with uncertainty over power and a binary type space assumed that both types had a positive value of war. Suppose instead that $1-p-c_B > 0$ but that $1-p'-c_B < 0$. This ensures that the p type's war payoff is positive but the p' type's is negative. For what values of q does A make a demand that risks war with positive probability?.

(Hint: First show that A's optimal demand must be either $x = p + c_B$ or $x = 1$. Then calculate the q value such that A prefers making the latter demand.)

2 Shrinking Pie Costs (5 points)

Rather than the states paying a direct cost of war (i.e., $c_A = c_B = 0$), suppose instead that war reduces the overall size of the bargaining good to $\pi \in (0, 1)$. Thus, the parties still receive x and $1 - x$ for an accepted demand. In contrast, A earns πp and B earns $\pi(1 - p)$ if they fight.

a) Suppose that B is privately informed whether the reduction in costs is $\pi' > \pi$ or π. Specifically, A believes the pie shrinks to π with probability q and shrinks to π' with probability $1 - q$. For what values of q does A make a demand that risks war with positive probability?

b) Are the conditions for war more or less favorable as p increases? Why?

3 Issue Indivisibility as a Cause of Peace (5 Points)

Consider the game with uncertainty over B's cost of war. However, imagine that the good at stake now has divisibility problems such that only four deals are possible: 0, $p + c_B$, $p + \frac{c_B + c_B'}{2}$, and 1.

a) For what values of q does A make a demand that risks war with positive probability?

b) Show that your answer to (a) is a weaker condition for war than without indivisibilities, where A fought the low cost type whenever $q > \frac{c_A + c_B}{c_A + c_B'}$. That is, demonstrate that the issue indivisibility has a peace-inducing effect. Using the concept of the peace premium to guide your discussion, explain why this is the case.

4 Uncertainty over Private Benefits (5 Points)

Suppose that B's leader receives a private benefit if she wins a war. This time, however, the size of that benefit is private information. In particular, suppose that Nature draws the benefit as $b > 0$ with probability q and as $b' > b$ with probability $1 - q$. As before, A demands x without observing the draw, and B accepts or rejects. Assume that $c_A + c_B > (1-p)b'$, such that agreements exist that are mutually preferable to war.

a) For what values of q does A make a demand that risks war with positive probability?

b) How does your answer to (a) change in p? What does that say about the neutrality result?