Homework 20

Economics 313

Fall 2013

1 Hawk-Dove Game (Mixed strategies)

Consider the hawk-dove game from the previous homework, in which the US (denote U) and Russia (denote R) have to decide whether to be a hawk (aggressive) or dove (passive) in its foreign policy stance.

<center>Russia</center>

	(u_U, u_R)	hawk	dove
	hawk	$(0,0)$	$(3,1)$
US	dove	$(1,3)$	$(2,2)$

Recall that we determined that two pure strategy Nash equilibria were dove-hawk and hawk-dove. Now, consider the mixed strategy Nash equilibrium where the US plays hawk with probability p_U and Russia plays hawk with probability p_R. (The h superscripts have been omitted to simplify the notation.)

c) What is the US' expected utility in terms of these two probabilities? What is Russia's expected utility? Please simplify as much as possible. [4 points]

d) Solve for the mixed strategy Nash equilibrium for the hawk-dove game. Explain why this set of probabilities you've solved for is a Nash equilibrium. (i.e. Suppose Russia plays the strategy you've found to be Nash. What is the US' best response? Similarly, suppose the US plays the strategy you've found to be Nash. What is Russia's best response? Why does this constitute a Nash equilibrium?) [6 points]