AGSM 5306 14 October 2009
R. E. Marks due 4 pm: 23 October 2009

STRATEGIC GAME THEORY FOR MANAGERS

Problem Set 2

Note: this is individual work. Make any economic assumptions you think necessary, but make them explicitly. You may talk to fellow students about this, but ***do not copy*** *others' work.*

1. (10) Answer ONE of:

   a. Draw an influence diagram for your decision to undertake an MBA. Make sure any uncertainties pass the *clairvoyant Clarity Test* (see pages 55–56 in Reading 17 of the Package — Clemen on "Structuring Decisions") and try to summon all your information and experience on the factors influencing the uncertainties. Has the exercise of drawing the influence diagram changed your understanding of the uncertainties at all? Could you do a meaningful probability assessment? Explain what (if anything) would prevent you from assessing any probabilities. Now draw a second, much simpler, I.D.: eliminate non-critical uncertainties and influences.

   b. Draw an influence diagram for the probability of a major pandemic within the next ten years. Make sure any uncertainties pass the "clairvoyant Clarity Test" — above. How is this problem different from part (a)? What if anything is preventing you from calculating a probability distribution for this problem? Now draw a second, much simpler, I.D.: eliminate non-critical uncertainties and influences.

   c. Draw an influence diagram for the ASB's (hypothetical) decision to enter into a joint venture with the National University of Singapore by offering a common MBA. Again, make sure any uncertainties pass the "clairvoyant Clarity Test". Are there any difficulties in completing this problem (calculating a probability distribution), and, if so, what are they? Now draw a second, much simpler, I.D.: eliminate non-critical uncertainties and influences.

2. (10) Sporting champion Mike tests positive for a banned substance. Suppose that the test is wrong 10% of the time and that you believe that 40% of athletes in this sport use the substance. Consider the following table of society's payoffs:

	Banned	Not banned
Drug User	10	−10
Non-User	−50	0

a. Should Mike be banned? What is the expected payoff? Explain. (Hint: see Lecture 9, pp. 37–39 to calculate the conditional probabilities by tree flipping.)

b. What if the payoff from banning a non-user is −150, instead of −50? Explain.

3. (10) *Pick a Box*: Eddie and the contestant face off: Eddie knows which one of the three boxes contains the cheque for $100k (the other two are empty). This is what *always* happens: Stephany the contestant chooses a box and announces her choice, but, before Eddie reveals the contents of the chosen box to her (and to us), he *always* reveals with a flourish that one of the two unchosen boxes is empty. He leaves it open. Always.

   a. What is the distinction between cheap-talk equilibrium and babbling equilibrium?

   b. Eddie always gives Steph a chance to change her choice to the other unopened box before she "locks in" her choice and he opens her chosen box, whichever she ends up choosing. Should she change her first choice? Explain. (Hint: put yourself in Eddie's shoes; a tree might also help.)

4. (10) A committee is examining an internal investment opportunity for the firm. All members are agreed that if the drought breaks by December 31, then Project A will NPV $600k in 2010 and that Project B will NPV $300k, but that if the drought has not broken by that date then Project A will NPV −$540k and Project B −$60k; there is also the option of doing nothing (an NPV of $0, come what may).

   They have heard of a clairvoyant weather forecaster in far north Queensland, with an excellent record of foretelling when droughts will break. Jack argues that a clairvoyant's value is no more than $204k, while Rose says that her calculations indicate $180k is the maximum, while Fred says the firm should pay nothing for perfect information about the drought.

   Using the Java applet (better using Firefox instead of IE) on the "Expected Value of Perfect Information (EVPI) on-line" link under Lecture 9 on the SGTM web page (or do it by hand, if you must), explain these disagreements. (All members accept the logic behind the EVPI calculations; all are risk-neutral decision makers.)

The EVPI link is:

http://www.cs.usask.ca/resources/tutorials/csconcepts/1999_6/Tutorial/Java/EVPIApp/evpi.html