

Copyright (C) 2005 David K. Levine

This document is an open textbook; you can redistribute it and/or modify it under the terms of version 1 of the open text license amendment to version 2 of the GNU General Public License. The open text license amendment is published by Michele Boldrin et al at <http://levine.sscnet.ucla.edu/general/gpl.htm>; the GPL is published by the Free Software Foundation at <http://www.gnu.org/copyleft/gpl.html>. It may also be used under the terms of the Creative Commons Attribution-Share Alike license.

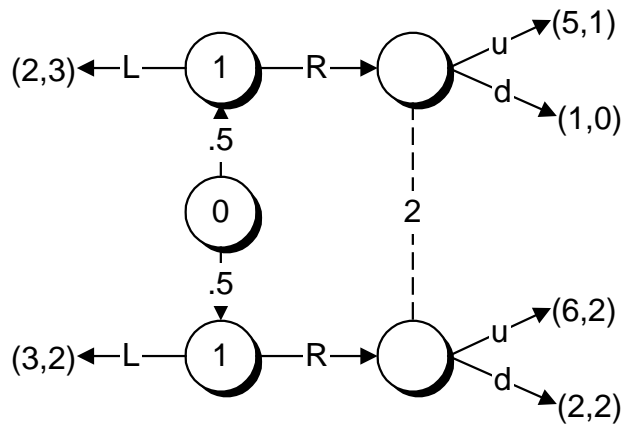
## Midterm Exam: Economics 201, David K. Levine

2/7/05

Instructions: Do all questions, and be sure to explain your answers. You have two hours. Good luck.

### 1. Sequential and other Equilibria

Consider the extensive form game given below



- Show that LL,d is a Nash equilibrium.
- Why is LL,d subgame perfect?
- Is LL,d trembling hand perfect?
- Consider an “assessment” by player 2 of the probability that Nature played UP versus DOWN. For what assessments would d be optimal by player 2?
- Are the assessments from part d “consistent” in the sense that you can find a sequence of positive probability trembles by player 1 and derive from those trembles using Bayes law a sequences assessments by player 2 that converge to the assessments from part d?

### 2. Backwards Induction

Consider the game of grab-a-dollar played in three rounds between two players. Initially player 1 may grab the dollar. If she does not (she “passes”), player 2 may grab 2 dollars. If player 2 does not grab, then player 1 chooses between taking 4 dollars and giving 8 dollars to player 2. The player that does not get the money gets nothing. Players’ utility is given by the expected amount of money the receive.

- Draw the extensive form.
- What is the subgame perfect equilibrium of this game.
- Show that in any Nash equilibrium player 1 must grab immediately.
- Are there any other Nash equilibria of the normal form?
- Find all Nash equilibria of the reduced normal form.
- Suppose that this is a Bayes game in which there is a “deviant” type of player 1 who is altruistic, here utility is the sum of payments to player 2 and herself. Suppose the probability of a deviant type is 30%. Describe a Bayesian equilibrium in which player 1 passes with probability 1.
- Continuing with the altruistic case, is there an equilibrium in which player 1 grabs with positive probability?