Final Exam

You have three hours. Do all questions. The exam is open book, but you may not communicate with other students. If you have a question email marina.sanchez@eui.eu.

1. Centipede Gambling

Two deadbeats, Zenia and Moe are at a gambling parlor and play a game. The game starts with one euro on the table and the two take turns with Zenia moving first. The player with the move can grab the money on the table, or leave it and it is quadrupled until the fourth and final round when Moe is moving. At this point there are sixty four euros on the table, and Moe can either quit the game with neither player getting anything or split the money with Zenia.

a. What is the unique subgame perfect equilibrium?
b. What is the Nash equilibrium in which the players get the least amount of money?
c. Find a heterogeneous self-confirming equilibrium in which Zenia gets 16.50 and Moe gets 16.
d. Is there a Nash equilibrium in which these are the payoffs?

2. An Insurrection Game

A long run government with discount factor δ faces an infinite sequence of one-period lived insurrectionists. The government may either fight or appease and the insurrectionists can either attack or stay home. The insurrectionists get zero for staying home, they get one if they attack and are appeased and minus one if they attack and the government fights. The government fights when there is no insurrection they must pay one to cover the costs of putting troops on the street. If they fight when there is an insurrection the cost is three. If they do not fight and there is no insurrection they get zero, but if there is an insurrection they get minus two.

a. What is the unique Nash equilibrium if the game is played once?
b. What is the highest possible subgame perfect equilibrium payoff for the government in the repeated game and for what discount factor is this in fact an equilibrium?

3. Market Design

A worker with a utility function for consumption of $10x - x^2$ has a job paying three but a 50% chance of becoming unemployed and earning one. You are asked to design an unemployment insurance contract. An employed worker, however, may work black and lie in order to collect the insurance. Consider an insurance contract that pays someone who claims to be unemployed $1 + \sqrt{2}$ with 50% probability and charges them $1 - \sqrt{2}$ with 50% probability, and that charges 1 to someone admitting to be employed.

a. Is this incentive compatible?
b. Is this welfare improving?