

Prof. Dr. Anke Gerber

# Advanced Game Theory

1. Exam Summer Term 2014

## Important Instructions

1. You have 90 minutes to finish the exam.
2. The maximum number of points is 90.
3. You are not allowed to use any material (books, lecture notes etc.), but you may use a non-programmable calculator.
4. Give a reason for your answers. You may end up with zero points for a question if it is not clear how you arrived at your solution.
5. Only use the paper that is handed out to you and submit all paper in the end (including any notes you do not want to be graded).
6. Please write your name on each sheet of paper, number the pages and leave a margin (2.5cm) on each page.
7. Please write legibly and make sure that your answers are coherent and complete.
8. Mobile phones must be switched off throughout the exam.

Good luck!

**Problem 1****(25 Points)**

Consider the following two-player normal form game:

		Player 2		
		L	C	R
Player 1	T	3, 6	4, 2	1, 1
	M	0, 0	2, 5	1, 2
	B	2, 1	3, 2	2, 4

1. Which strategies survive the iterated elimination of strategies that are strictly dominated by pure or mixed strategies?

(10 Points)

2. Determine all pure and mixed strategy Nash equilibria of the game.

(15 Points)

**Problem 2****(30 Points)**

Consider the following two-player normal form game:

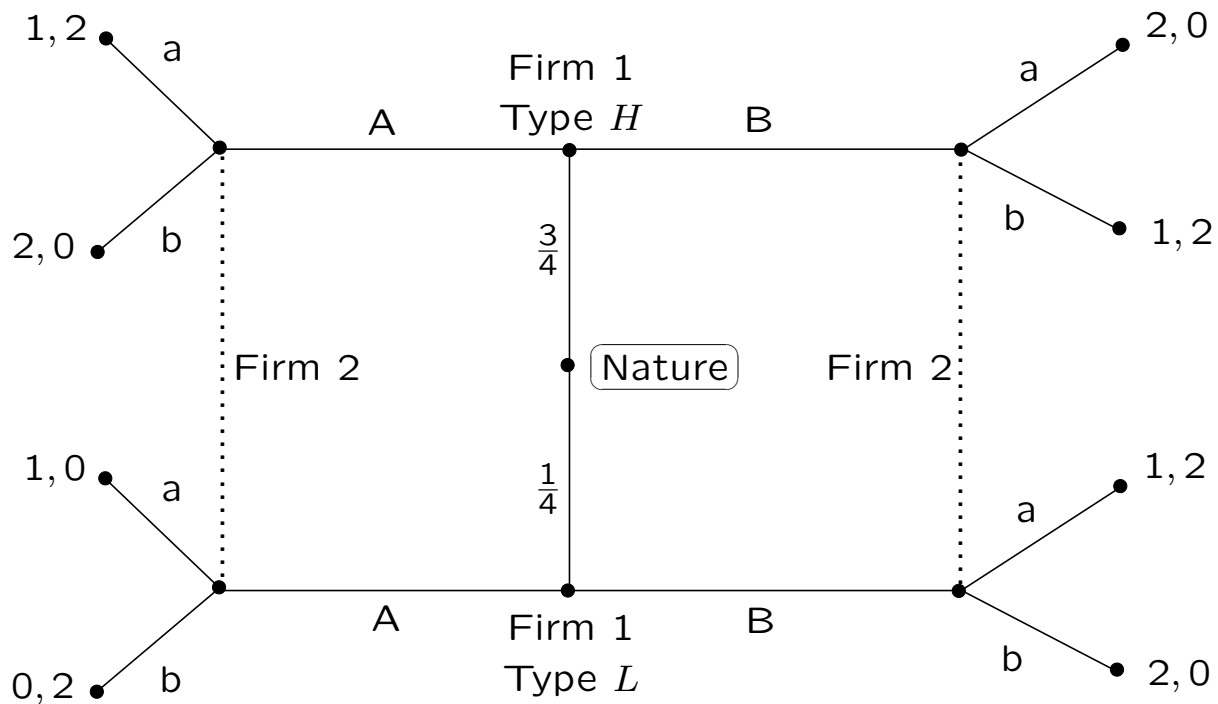
		Player 2		
		L	C	R
Player 1	U	0, 2	1, 1	0, 0
	D	0, 2	0, 0	1, 0

1. Determine all pure and mixed strategy equilibria of the game.  
(5 Points)
2. Which of the pure strategy Nash equilibria is trembling-hand perfect? Give a reason for your answer.  
(10 Points)
3. Which of the pure strategy Nash equilibria is proper? Give a reason for your answer.  
(15 Points)

**Problem 3****(35 Points)**

Consider the following signaling game: There are two firms. Firm 1 can be of two types: with probability  $\frac{3}{4}$  firm 1 is type  $H$  and with probability  $\frac{1}{4}$  firm 1 is type  $L$ . The type of firm 1 is randomly determined by nature and only observed by firm 1. After observing its type firm 1 chooses to offer product A or product B. Firm 1's offer is observed by firm 2 who then chooses to offer product a or product b.

The following figure shows the profits of the firms depending on the type of firm 1 and the offers of both firms. The first number at a terminal node is the profit of firm 1 and the second number is the profit of firm 2.



1. Show that there does not exist a weak perfect Bayesian equilibrium where firm 1 always offers A, independent of its type.

(10 Points)

2. Determine a weak perfect Bayesian equilibrium where firm 1 always offers B, independent of its type.

(15 Points)

3. Does the pooling equilibrium under 2. satisfy the intuitive criterion?

(10 Points)