



Corporate Investment Appraisal

Masters in Finance

2014-2015

Fall Semester

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Problem Set N° 1:

Basic Concepts of Game Theory (Definition of Equilibrium)

**HAND IN SOLUTIONS - CLASS OF OCTOBER 1<sup>st</sup>, 2014**

**Problem 1:** Compute all the Nash Equilibria of the game “Matching Pennies”. Explain your answer.

**Problem 2:** What are the Nash equilibria of the following game, after elimination of dominated strategies? Explain the steps followed in order to reach your results.

		Player B		
		Left	Center	Right
Player A	Top	3,3	0,4	0,1
	Middle	3,0	1,2	0,2
	Bottom	0,0	1,0	2,1

**Problem 3:** Two Californian teenagers, Bill and Ted, are playing a game with the following pay-offs matrix:

		Ted	
		Left	Right
Bill	Top	-1,-1	3,0
	Bottom	0,3	2,2

- Determine all equilibria in pure strategies. Explain.
- Determine all equilibria in mixed strategies. Explain.
- What’s the probability of both players having positive pay-offs? Explain.

**Problem 4:** Consider the following coordination game:

		Player B	
		Left	Right
Player A	Top	3,3	-1,-1
	Bottom	-1,-1	1,1

- (a) Compute all pure strategy equilibria of this game. Explain.
- (b) Do any of these strategies dominate any of the others? Explain.
- (c) Now suppose that Player A plays first, committing to choose either Top or Bottom. Are the strategies of question (a) still Nash equilibria?
- (d) What are the “subgame perfect” equilibria of this game?

**Problem 5:** Consider the previous question’s game, in which the players choose their strategies simultaneously.

- (a) Represent the game in extensive form.
- (b) Describe the perfect Bayesian equilibria (PBE) of this game.