

EconS 503 - Microeconomic Theory II

Homework #1 - Due date: Monday 22nd, in class.

1. **[Strict dominant equilibrium and IDSDS]** A strategy profile $s^* = (s_1^*, \dots, s_N^*)$ is a strict dominant equilibrium if s_i^* is strictly dominant for every player $i \in N$, that is,

$$u_i(s_i^*, s_{-i}) > u_i(s_i, s_{-i}) \quad \text{for all } s_i \neq s_i^* \quad \text{and for all } s_{-i} \in S_{-i}.$$

- (a) Show that if strategy profile s^* is a strict dominant equilibrium, then it must be the only strategy profile surviving the iterative deletion of strictly dominated strategies (IDSDS).
- (b) Show that if a strategy profile is the only one surviving IDSDS, it does not need to coincide with the strict dominant equilibrium. [*Hint*: An example suffices, where you provide a game where the strict dominant equilibrium does not exist.]
2. Consider the 3x3 matrix at the bottom of page 72 in Tadelis.
- (a) Find the strict dominant equilibrium of this game.
- (b) Which strategy profile/s survive IDSDS?
- (c) Which strategy profile/s survive rationalizability?
3. **[Equilibrium predictions from IDSDS vs. IDWDS]** While the order of deletion of dominated strategies does not affect the equilibrium outcome when applying IDSDS, it can affect the set of equilibrium outcomes when we delete weakly (rather than strictly) dominated strategies. Use the payoff matrix below to show that the order in which weakly dominated strategies are eliminated can affect equilibrium outcomes.

		Player 2		
		<i>L</i>	<i>M</i>	<i>R</i>
Player 1	<i>U</i>	2, 1	1, 1	0, 0
	<i>C</i>	1, 2	3, 1	2, 1
	<i>D</i>	2, -2	1, -1	-1, -1

4. **Exercises 7.6 and 7.8 from JR** (see page 365 in new edition).
5. **Exercises from Tadelis:**
- (a) Chapter 4: Exercises 4.3, and 4.7.
- (b) Chapter 5: Exercises 5.1, and 5.9.