

EconS 503 - Microeconomic Theory II  
Homework #3 - Due date: March 3rd, 2021

1. **Bargaining with infinite periods and  $N \geq 2$  players.** Consider the infinite-period alternating-offer bargaining game presented in class, but let us allow for  $N \geq 2$  players. Player 1 is the proposer in period 1, period  $N + 1$ , period  $2N + 1$ , and so on. Similarly, player 2 is the proposer in period 2, period  $N + 2$ , period  $2N + 2$ , and so on. A similar argument applies to any player who becomes the proposer for the first time in period  $k$ , becoming again the proposer in period  $N + k$ , period  $2N + k$ , etc.

A division of the surplus at period  $t$  is a vector describing the share that each player receives  $(d_t^1, d_t^2, \dots, d_t^N)$  satisfying  $d_t^i \in [0, 1]$  for every player  $i$  and  $\sum_{i=1}^N d_t^i = 1$ . Assume that a division must be approved by all other  $N - 1$  players for it to be accepted (i.e., it requires unanimity). Focus on stationary equilibrium offers, implying that the equilibrium payoff that every player earns only depends on who is the player making offers at that period (himself, the player making offers in the next period, the player making offers in two periods from now, etc.)

- (a) Find the SPE of this game.
  - (b) Evaluate your results at  $N = 2$  and show that they coincide with those in the infinite-period alternating-offer bargaining game presented in class.
  - (c) Evaluate your results at  $N = 3$ . Compare them with those in part (b).
2. **Exercises from Tadelis:**
- (a) Exercises from Chapter 10: 10.6, 10.9, and 10.11.
3. Exercise 8.30 (Chapter 8) from the *Advanced Microeconomic Theory* textbook (MIT Press)