

# Discrete Sets of Alternatives and Costless Delay in Negotiations

P. Jean-Jacques Herings   Harold Houba

## Abstract

Bloch and Diamantoudi (CNT, 2007) apply a coalitional bargaining model to a class of hedonic games capturing two-sided markets and network problems. They consider pure stationary strategies and no discounting. For the roommate problem they report non-existence of stationary subgame perfect equilibria (SSPE).

This paper addresses several methodological issues:

1. Can we apply the one-stage deviation principle, which is valid under continuity at infinity, in the absence of discounting?
2. Can we apply the familiar recursive equations of dynamic programming under no discounting?
3. Can we establish existence of SSPE in mixed strategies?
4. What do mixed strategies yield for the roommate problem?

We study these issues in a bargaining model with a discrete set of alternatives in which the negotiations end after the first coalition forms. Wrt. issue 1, "Yes, we can". Wrt. issue 2, the necessary and sufficient conditions under which one can use recursive equations state that there should not be perpetual disagreement. Wrt. issue 3, we show the existence of so-called candidate SSPE. Wrt issue 4, the roommate problem admits a mixed strategy SSPE under discounting, but its limit under no discounting is not SSPE because the limit violates the conditions under issue 2.

JEL Classification: C72 Noncooperative Games, C73 Stochastic and Dynamic Games, C78 Bargaining Theory

Keywords: Bargaining, negotiation, existence, one-stage-deviation principle