

A Stackelberg Differential Game with Overlapping Generations

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Abstract

We study a differential game, for the extraction of a renewable resource, in which players are overlapping generations of extractors. The framework of overlapping generation allows us to consider both intra-generational (players in the same generation) and intergenerational (players in different generations) competition. Since we consider overlapping generations, players have asynchronous horizons. We consider the case in which players, even if identical, face competition in an asymmetric way by mean of two different approaches: different costs and Leader-Follower competition. The leader-follower structure, as a consequence of the overlapping generation framework, is not fixed but depends on the time period in which each player is living in. The behaviour of the players can be of two ways: myopic or not myopic.

Keywords: Feedback Nash Equilibrium, resource extraction, overlapping generations, asynchronous horizon, asymmetric players, Stackelberg differential game.

Subject Classification: 91A23, 49N90, 91A80.

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