Applications of Weak Convergence for Hedging of American and Game Options

Yan Dolinsky

Institute of Mathematics, The Hebrew University

yann1@math.huji.ac.il

Abstract. This paper studies stability of Dynkin's games value under weak convergence. We use these results to approximate game options prices with path dependent payoffs in continuous time models by sequence of game options prices in discrete time models for which can be calculated by dynamical programming algorithms. We also show that shortfall risks of American options in a sequence of multinomial approximations of the multidimensional Black–Scholes (BS) market converge to the corresponding quantities for similar American options in the multidimensional BS market with path dependent payoffs. The crucial difference here with previous papers [1] and [2] on discrete approximations of game options is that we consider only weak convergence of quite general underlying processes and do not assume the Lipschitz continuity of payoffs. This comes at the price that no error estimates of approximations are no longer possible.

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Keywords game options, Dynkin games, shortfall risk, weak convergence.

Viitteet

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