Optimal Strategy for the Vardi Casino with Interest Payments

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Abstract. We give a general variational method of determining the optimal survival probability of a gambler starting with a fortune $f < 1$ who plays in a Dubins-Savage type of casino with infinitely many tables indexed by their odds $r \geq 0$. All tables return the same expected winnings $c < 0$ and a discount factor $1 + a$ is applied after each round. We determine the optimal probability to reach fortune one, its structure, as well as an optimal strategy, different from bold play for fortunes larger than a critical value depending exclusively on c and the discount factor. Some particular cases are calculated explicitly.

Keywords optimal strategy; bold play; Dubins casino