

[Available Issues](#) | [Japanese](#)>> [Publisher Site](#)Author: Keyword:

Search

[ADVANCED](#)[TOP](#) > [Available Issues](#) > [Table of Contents](#) > [Abstract](#)

ONLINE ISSN : 1348-6365

PRINT ISSN : 1882-2754

JOURNAL OF THE JAPAN STATISTICAL SOCIETY

Vol. 37 (2007) , No. 1 pp.87-104

[\[PDF \(175K\)\]](#) [\[References\]](#)

Game-Theoretic Derivation of Discrete Distributions and Discrete Pricing Formulas

Akimichi Takemura¹⁾ and Taiji Suzuki¹⁾

1) *Department of Mathematical Informatics, Graduate School of Information Science and Technology, University of Tokyo*

Abstract: In this expository paper, we illustrate the generality of the game-theoretic probability protocols of Shafer and Vovk (2001) in finite-horizon discrete games. By restricting ourselves to finite-horizon discrete games, we can explicitly describe how discrete distributions with finite support and discrete pricing formulas, such as the Cox-Ross-Rubinstein formula, are naturally derived from game-theoretic probability protocols. Corresponding to any discrete distribution with finite support, we construct a finite-horizon discrete game, a replicating strategy of Skeptic, and a neutral forecasting strategy of Forecaster, such that the discrete distribution is derived from the game. Construction of a replicating strategy is the same as in the standard arbitrage arguments of pricing European options in binomial tree models. However the game-theoretic framework is advantageous because it eliminates the need for any a priori probabilistic assumption.

Key words: binomial distribution, Cox-Ross-Rubinstein formula, hypergeometric distribution, lower price, Polya's distribution, probability protocol, replicating strategy, upper price

[\[PDF \(175K\)\]](#) [\[References\]](#)Download Meta of Article [\[Help\]](#)[RIS](#)[BibTeX](#)

JOI JST.JSTAGE/jjss/37.87

Copyright (c) 2008 Japan Statistical Society



[Japan Science and Technology Information Aggregator, Electronic](#)

