

Rank-based Market Models

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Abstract

The size of company is one of its important characteristics for investors' portfolio choice. In this talk we discuss probabilistic models of equity markets where the dynamics of capitalizations of companies can be described by a class of stochastic differential equations whose coefficients depend on the rank of their relative sizes. The construction of such models requires some caution about ties of three or more companies. Under appropriate conditions we identify some connection with the theory of semimartingale reflected Brownian motions, and we see that market weights of the companies have a unique stationary distribution that is related to mixture of Pareto distributions. We examine relative performance of various portfolios that include equally weighted portfolios, entropy-weighted portfolios, and universal portfolios, based on understandings of long-term behavior of the market. We also discuss several directions of extensions of the rank-based models and related analyses. Part of research is joint work with Adrian Banner, Robert Fernholz, Ioannis Karatzas, Vassilios Papathanakos, Soumik Pal, Vilmos Prokaj and Mykhaylo Shkolnikov.

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