

# A dynamic stochastic model of asset pricing with heterogeneous beliefs

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## Abstract

This paper presents a new stochastic model of asset pricing, based on agents with heterogeneous beliefs. Forecasting rules of all agents are characterized by a stochastic term that works as an agent-based time dependent weight of the conditional expectation of the fundamental. Since we consider the presence of an imitative behavior between agents, these weights depend stochastically on the type-distribution of agents. The resulting dynamical system is firstly analyzed in a deterministic framework. Starting from the results obtained in the deterministic case, the model is lastly explored by reintroducing randomness. The deterministic study aims at providing the existence of a region in the parameters plane where the unique possible dynamics is the convergence to a steady state, while complexity is exhibited outside such region. This region is also analyzed by reintroducing stochasticity and we provide an explicit formula for its probability measure. Our findings are in agreement with the economic meaning of the parameters. Finally, we propose a bayesian analysis, in order to explore the distribution of the adjustment term of the proportion of agents.

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