Complex dynamics in an asset pricing model with updating wealth

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Many studies on present discounted value asset pricing model with heterogeneous agents have been developed afterwards the work of Brock and Hommes (1998). A common feature of this kind of models is the independence of the optimal demand for the risky asset from agents' wealth, as a result of the assumption of Constant Absolute Risk Aversion utility function. As stated by many recent studies, this assumption is unrealistic, see e.g. Levy et al. (2000) and Campbell and Viceira (2002).

In particular, part of the literature has been focused on the study of the evolution of agents' wealth and its effect on price dynamics, by assuming that investors' optimal demand for the risky asset depends on wealth as a result of a Constant Relative Risk Aversion utility function (see Chiarella and He (2001), Chiarella and He (2002) and Chiarella et al. (2006)). Following this research line, we develop an asset pricing model with heterogeneous beliefs and wealth dynamics considering two types of agents. In particular, we enable agents to switch among different predictors and to bring their own wealth from a group to another one. Furthermore we assume homogeneity between agents within the same group and heterogeneity between agents belonging to different groups, in the sense that all agents belonging to the same group agree to share their wealth whenever an agent gets in the group (or leaves it). As a consequence the wealth of each group is updated at each time and changes dynamically. We assume that the price adjustments are operated by a market maker, as in Chiarella et al. (2006). We derive the resulting deterministic nonlinear dynamic system and analyze the model in order to investigate complicated dynamics and to consider the effects on wealth distribution among agents.

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