EVOLUTIONARY BEHAVIOURAL FINANCE

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Evolutionary Behavioural Finance (EBF) is a novel direction of research at the interface of Mathematical Finance and Financial Economics that combines evolutionary and behavioural approaches to the modelling of financial markets. The ultimate goal is to create an operational alternative to classical financial General Equilibrium theory (Radner equilibrium) currently serving as the basis for mainstream Financial Economics. Conventional GE analysis relies upon the hypothesis of full rationality of market players, who are assumed to maximize their utilities subject to budget constraints, i.e. solve well-defined and precisely stated constrained optimization problems. EBF models relax these restrictive assumptions and permit traders/investors to have a whole variety of patterns of behaviour determined by their individual psychology, not necessarily describable in terms of individual utility maximization. Strategies may involve, for example, mimicking, satisficing, rules of thumb based on experience, etc. Strategies might be interactive – depending on the behaviour of the others. Objectives might be of an evolutionary nature: survival (especially in crisis environments), domination in a market segment, fastest capital growth, etc. They might be relative – taking account of the performance of the others.

The models considered in EBF combine elements of evolutionary game theory (solution concepts) and stochastic dynamic games (strategic frameworks). The main focus is on investment strategies that "survive" in the market selection process, i.e., guarantee with probability one a positive, bounded away from zero share of market wealth over an infinite time horizon. Typical results show that such strategies exist, are asymptotically unique and can be computed by explicit formulas. The computations do not require (in contrast with GE) the knowledge of hidden individual agents' characteristics, such as individual utilities and beliefs, which makes EBF models amenable for quantitative financial applications.

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