Habit formation in optimat consumption and portfolio model

Time-separability is a conventional assumption of utilities in financial economics. It produces often unrealistic results. This problem is solvable by applying more general utility formulation. One generally used unconventional utility formulation is habit formation in preferences, which is a more general form of the utility function. It assumes that utility in period t depends on not just consumption in same period but also the level of consumption in the previous periods. This means that a consumer does not like consume less than his living standard today. Some empirical studies implies that habit utilities is better description of consumer's behavior than time-separable utilities.

In the seminal paper, Merton(1971) examines the continuous-time consumption-portfolio problem for an individual whose income is generated by capital gains on investments in assets with prices assumed to satisfy the geometric Brownian motion hypothesis. The consumer/investor invests his wealth in risky assets and in a risk-free asset, whose rate of return is constant. Merton solves optimization problem using Ito's Rule and finds out the optimal consumption and portfolio choice. Merton assumes that the consumer's utilities are time-separable. The optimal consumption can also be solved by the martingale approach. Then the dynamic problem can be reformulated as a static problem.

Habit utility function can be applied to the Merton's problem. In this study, I review how the assumption of habit utilities changes the optimal consumption and investment choice. I consider different cases. In the simplest case the coefficients of interest and stock markets and the coefficients of habit utility function are assumed to be deterministic. In the more general case, these coefficients are assumed to be stochastic. In the literature has been shown isomorphism between solutions in the separable and linear habit cases. This isomorphism is useful for solving the problem in the habit case. Solutions in the separable case can transform to corresponding solutions with habit formation. I use this isomorphism in the case where all investment opportunities are stochastic. I also consider an interesting situation in which non-addictive consumption has been assumed. This assumption changes significantly results.

Generally consumer/investor with habit presence invests less in the risky assets than consumer/investor with time-separable utilities. Through research, I accept the common assumption of complete markets. It makes easier or even possible to find closed-form solutions.

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