

Aggregate Uncertainty, Repeated Transition Method, and the Aggregate Cash Cycle

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Abstract

This paper develops and tests a novel algorithm that solves heterogeneous agent models with aggregate uncertainty. The algorithm is based on the ergodic theorem: if a simulated path of the aggregate shock is long enough, all the possible aggregate allocations are realized, which allows to fully recover rationally expected future outcomes at each point on the path. This method solves the nonlinear dynamic stochastic general equilibrium globally with a high degree of accuracy. Furthermore, the market-clearing prices and the expected aggregate states are directly computed at each point on the path without relying on a parametric law of motion. Using the algorithm, I analyze a heterogeneous-firm business cycle model where firms are subject to an external financing cost and hoard cash as a buffer stock. In the model, due to the missing general equilibrium effect on cash, the aggregate fluctuations in cash and consumption feature significant nonlinearity and state dependence. Based on the model, I discuss the business cycle implications of the corporate cash holdings.

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