Fiscal Policy and The Share of Non-Ricardian Households :A Monte Carlo Particle Filtering Approach

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Abstract

This paper estimates the share of liquidity-constrained households in medium size new Keynesian, dynamic stochastic general equilibrium models using the Monte Carlo particle filter and a self-organizing state space model. The share of liquidity-constrained households is a dominant factor for fiscal policy analysis because the effectiveness of it is depend on the share. In previous studies, the share is estimated under the assumption that it is a constant. Some previous studies, however, report that the influences of fiscal stimulation declined in Japanese 1990s which is often called a "lost decade". It suggests the possibility of time varying share of liquidity-constrained households. In our method, we estimate the share using the time-varying-parameter approach, which is often used to infer invariant parameters in practice. Furthermore, the interaction of fiscal and monetary policy is so important to stimulate the economy in recessions. However, there are a difficulty to study Japanese 1990s. Using MCMC, previous studies estimate DSGE models for Japan in the "pre-zero-interest-rate" period (1970[1981]-1995). They avoid using data from the "zero-interest-rate" period (1999-2006) because it is necessary to estimate the Taylor rule with the non-negativity constraint on short-term nominal interest rates. However, the periods are a matter of serious concern for the long-term stagnation and the deflation in the 1990s. In empirical analysis, we adopt a new estimation method, based on the Monte Carlo particle filter to estimate the share using Japanese macroeconomic data, which includes the "pre-zero-interest-rate" period (1980-1998), the "zero-interest-rate" period (1999-2006), and the "post-zero-interest-rate" period (2007-2008).

Keywords: Bayesian statistics, Monte Carlo particle filter, dynamic stochastic general equilibrium model, fiscal and monetary policy, non-negativity constraint on short term nominal interest rate, liquidity trap
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