**US\_FV15: Fernández-Villaverde (2015)**

Fernández-Villaverde (2015) employs a canonical medium-scale closed economy DSGE-Model similar to Smets and Wouters (2007), estimated on U.S. data, but augmented with time-varying volatility in the shocks. The model features a deterministic growth rate driven by labor-augmenting technological progress, so that the data do not need to be detrended before estimation. The code is written in non-linearized form.

* Aggregate demand: Households maximize their lifetime utility, where the utility function is separable in consumption, leisure and real money balances, subject to an intertemporal budget constraint. Consumption utility is subject to habit formation. Households own firms, rent capital services to firms and decide on investment given certain investment adjustment costs.
* Aggregate Supply: The final goods, which are produced under perfect competition, are used for consumption and investment by the households. The final goods producer aggregates intermediate goods using a constant elasticity of substitution (CES) production function. A continuum of monopolistically competitive intermediate firms produce differentiated goods using a production function with Cobb-Douglas technology and fixed costs and sell these goods to the final-good sector. They decide on labor and capital inputs, and set prices according to the Calvo model. Labor is differentiated by a union using the CES aggregator, too, so that there is some monopoly power over wages, which results in an explicit wage equation. Labor packers buy the labor from the unions and resell it to the intermediate goods producer in a perfectly competitive environment. Sticky wages à la Calvo are additionally assumed. The Calvo model in both wage and price setting is augmented by the assumption that prices that cannot be freely set, are partially indexed to past inflation rates.
* Shocks: A total factor productivity shock, an investment-specific technology shock, an intertemporal preference shock, an intratemporal preference shock and a monetary policy shock. The standard deviations of the structural innovations are subject to stochastic volatility shocks. The model also includes shocks to the two parameters in the monetary policy rule.
* Calibration/Estimation: The model is estimated for the U.S. with Bayesian techniques for the period 1959:1–2007:1 using five key macroeconomic variables: relative price of investment, real output per capita growth, real wages per capita, CPI inflation and the federal funds rate.
* Replication: We replicated the impulse response functions to a positive one standard deviation monetary policy shock and technology shock, as shown in Figure 6.1 and 6.2 of the technical appendix.