Monetary and Fiscal Policy in a Financial Accelerator Model

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Motivation

- The financial crisis led to a deterioration of balance sheets of many financial intermediaries due to the subprime mortgage market collapse in the United States
- Research objective is to built up a model which incorporates recent policy developments, i.e. the intervention of the ECB and the fiscal stimuli that were undertaken
- So far, both types of intervention in response to a (financial) crisis have been analyzed in great detail separately
- However, the combination of both policies has not been investigated intensively
- I combine them by incorporating the possibility of central bank intervention on capital markets and by introducing fiscal policy rules
- This should give additional insights in the interaction of monetary

The Model II

Financial Intermediaries

- Financial intermediaries are banks which are owned by households and which obtain funds from households to invest in both non-financial firms and government bonds
- They are capital constrained (ϕ_{ct} is the leverage ratio)

$$P_t = \phi_{ct} N_t$$

Government and Central Bank

- The central bank can provide funds in times of a crisis by increasing the leverage ratio
- The government adjusts its fiscal variables according to the following feedback rule (taking the consumption tax rate as an example)

$$\tau_t^c = {\tau_{t-1}^c}^{\rho_c} \left[\tau^c \left(\frac{Y_t}{Y} \right)^{\theta_{cy}} \left(\frac{B_t}{B} \right)^{\theta_{by}} \right]^{1-\rho_c} \varepsilon_t^c.$$

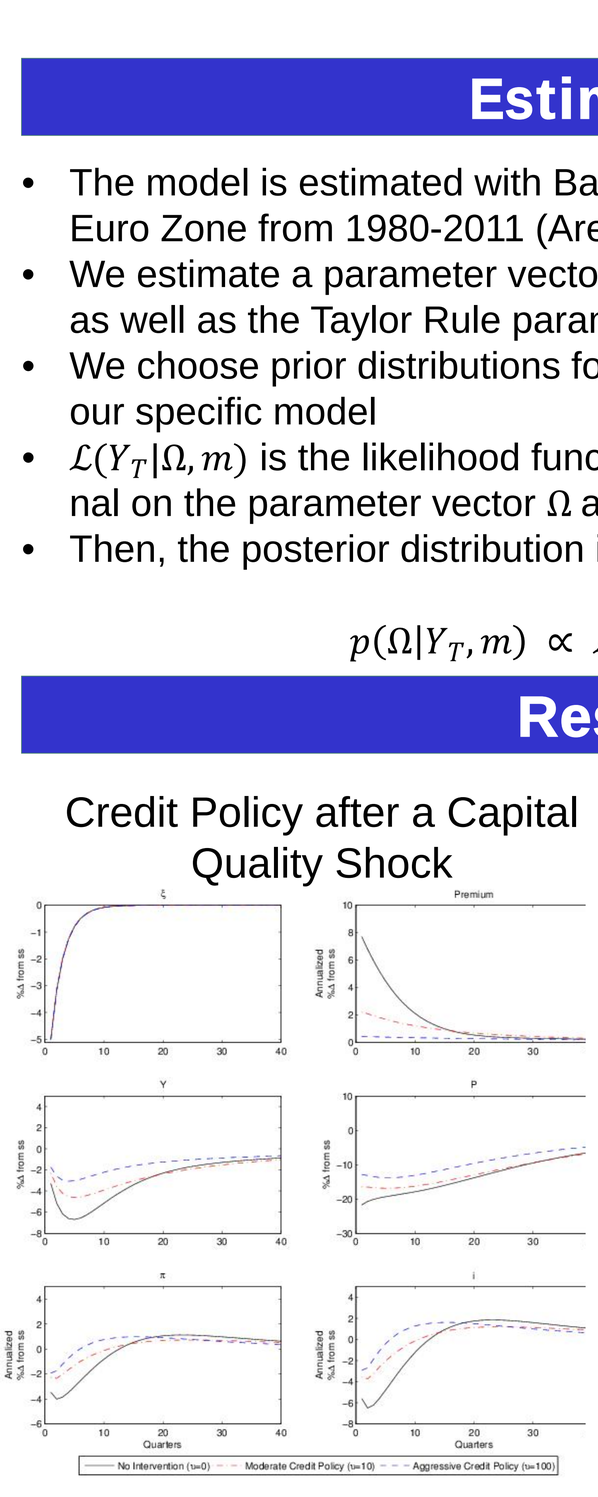
Estimation

- The model is estimated with Bayesian techniques using data for the Euro Zone from 1980-2011 (Area Wide Model and fiscal database)
- We estimate a parameter vector Ω, which includes the feedback rule as well as the Taylor Rule parameters
- We choose prior distributions for the parameters $p(\Omega|m)$, where m is our specific model
- $\mathcal{L}(Y_T|\Omega, m)$ is the likelihood function for the observed data conditional on the parameter vector Ω and our model m
- Then, the posterior distribution is given by

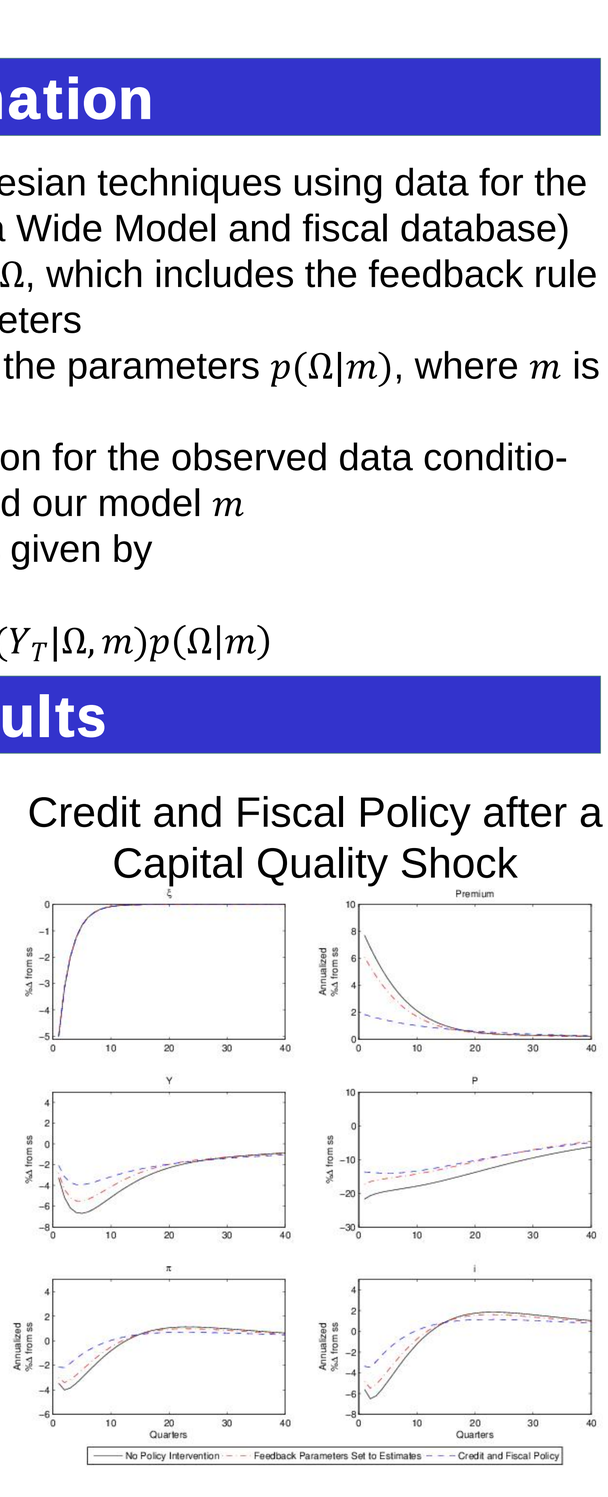
$$p(\Omega|Y_T, m) \propto \mathcal{L}(Y_T|\Omega, m) p(\Omega|m)$$

Results

Credit Policy after a Capital Quality Shock



Credit and Fiscal Policy after a Capital Quality Shock



The Model I

Households

- Households consume goods and supply labor and invest in financial intermediaries

Intermediate Goods Firms

- They produce with $Y_t = (A_t U_t \xi_t K_t)^{\alpha} \, \mathrm{L}_t^{1-\alpha}$, sell the goods to retailers and need capital for production
- Capital aquisition is financed via financial intermediaries by issuing claims on the amount of capital bought
- Claims pay an gross interest rate R_{kt} to the financial intermediary

Capital Producing Firms

- Capital producers buy the remaining capital stock from intermediate goods producers
- They use the depreciated capital and investment goods to build new capital which is sold at a price Q_t
- They face adjustment costs with respect to newly built capital

Retail Firms

- They set prices in a Calvo-fashion

Estimation Results

Table 2: Estimated Parameters - Priors and Posteriors

Parameter	Prior distribution	Posterior distribution Mode	Mean	5%	95%
Output feedback coefficients in fiscal rules					
θ_{cy}	$N(0,2)$	-0.7549	-0.7429	-0.9558	-0.5369
θ_{ly}	$N(0,2)$	0.3324	-0.2422	0.1572	0.3495
θ_{sshy}	$N(0,2)$	-0.1885	-0.0977	-0.2638	0.0392
θ_{ssfy}	$N(0,2)$	0.0534	0.0230	-0.2159	0.2476
θ_{try}	$N(0,2)$	0.2218	0.1015	0.0009	0.2298
θ_{gy}	$N(0,2)$	0.9809	0.9923	0.7424	1.2030
Debt feedback coefficients in fiscal rules					
θ_{cb}	$N(0,2)$	0.2486	0.2492	0.1385	0.3692
θ_{lb}	$N(0,2)$	0.0386	0.0661	0.0046	0.1245
θ_{sshb}	$N(0,2)$	-0.1833	-0.3181	-0.4898	-0.1405
θ_{ssfb}	$N(0,2)$	0.0636	0.0650	-0.0222	0.1550
θ_{trb}	$N(0,2)$	0.2645	0.3229	0.1378	0.4788
θ_{gb}	$N(0,2)$	-0.1730	-0.2193	-0.3664	-0.0765
Lagged dependent variable in fiscal rules					
ρ_c	$B(0.5,0.2)$	0.9078	0.9044	0.8976	0.9102
ρ_l	$B(0.5,0.2)$	0.8026	0.7860	0.7860	0.8074
ρ_{ssh}	$B(0.5,0.2)$	0.9561	0.9586	0.9428	0.9722
ρ_{ssf}	$B(0.5,0.2)$	0.9064	0.9041	0.9002	0.9079
ρ_{tr}	$B(0.5,0.2)$	0.9348	0.9357	0.9346	0.9371
ρ_g	$B(0.5,0.2)$	0.9610	0.9614	0.9602	0.9624
ρ_{tax}	$B(0.5,0.2)$	0.8263	0.8235	0.8101	0.8387
Taylor Rule parameters					
κ_π	$N(0,2)$	1.6564	1.6477	1.6294	1.6601
κ_y	$N(0,2)$	0.0227	0.0240	0.0213	0.0270

Notes: The posterior distribution is obtained using the Metropolis-Hastings algorithm.
Source: Coenen, Straub, and Trabandt (2013), Smets and Wouters (2007), own calculations

Conclusions

- Capital quality shock represents the downturn in assets after the financial crisis
- Incorporation of enhanced portfolio choice for financial intermediaries and an enlarged fiscal sector worsened the negative effects of a capital quality shock
- Balance sheet constraints of private intermediaries raise benefits of central bank intermediation
- Credit policy is welfare-enhancing in times of a crisis
- Fiscal policy also seems to have an impact on the overall result (given my estimates for feedback parameters)
- Nevertheless, combination of credit and fiscal policy has most significant recession easing effect

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