Problem Set 2

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1 Exercise 1

1.1 Problem 1

The classification into endogenous, exogenous and model parameters can be found in my *Baxter_King.mod* file.

1.2 Problem 2

I solved for the steady state using Matlab and equation (1)-(14) in *Solve_for_stead_state.m*. If I set the ρ and σ equal to 0.75 and 1%, respectively, follow the definition from the table and choose $\beta = 0.99$ (as in the lecture), $\delta = 2\%$ (as in the lecture) and $\eta = 0.8$ (non-exploding economy) I get

$\bar{\lambda}$	$\bar{\tau}$	$\bar{\Theta}_l$	$\bar{C}$	$\bar{I}$	$\bar{r}$	$\bar{K}$	$\bar{\alpha}$	$\bar{K^B}$	$\bar{z}$
1.3095	0.2200	1.3619	0.7636	0.0164	0.4073	0.8184	0.3333	1.0000	2.2238

1.3 Problem 3

In a deterministic model all futures outcomes are known at any given time and there are no surprises in the economy. The agent(s) can plan everything perfectly. A change in the model parameters can be interpreted as a regime switch and due to the non-stochasticity of the model this gives a way to isolate the resulting effects. However, those models naturally lack of risk premiums and thus provide an overall unrealistic environment.
Stochastic models contain risk that stems from unpredictable shocks to the economy. Those shocks then carry a risk premium and result in a completely different behavior of the models agent(s), because they exhibit a need to hedge. When a stochastic model is considered linearizion is no longer a valid solving method since then only the expected values of the model's variables matter and higher moments starting from order 2 are no longer important and in fact in the approximated model the agent will behave as in a non stochastic setting.

1.4 Problem 4

My solution can be found in *Baxter_King.mod*.

1.5 Problem 5

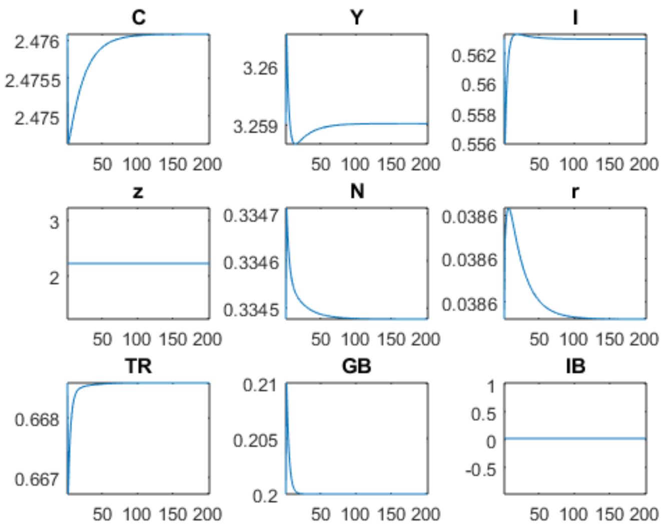

Abbildung 1: Public Consumption Shocks

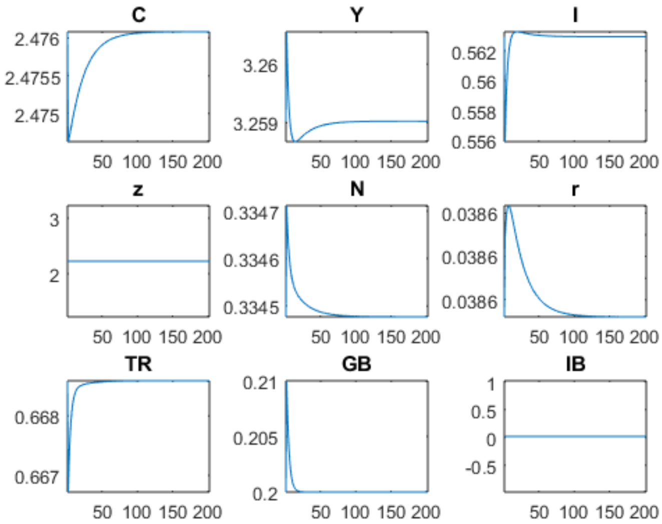

Abbildung 2: Public Investment Shocks

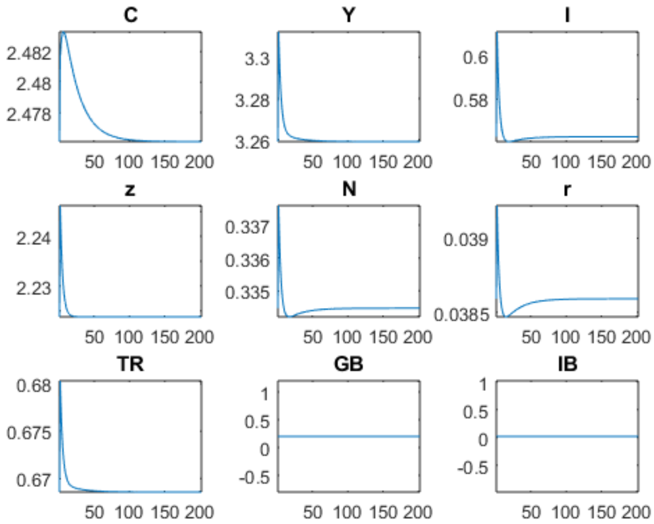

Abbildung 3: Productivity Shocks

1.6 Problem 6

If I change $\bar{TR}$ from zero to 1% I get the following new steady state

$\bar{\lambda}$	$\bar{\tau}$	$\bar{\Theta}_l$	$\bar{C}$	$\bar{I}$	$\bar{r}$	$\bar{K}$	$\bar{\alpha}$	$\bar{K}^B$	$\bar{z}$
1.3000	0.2300	1.3347	0.7692	0.0108	0.6192	0.5383	0.3333	1.0000	2.5570

2 Exercise 2

2.1 Problem 1

The number of shocks have to be equal to the number of observable variables. My choice for *varobs* can be found in *AnScho.mod* file.

2.2 Problem 2

The simulated date can be found in the attached *simdat.dat* file.

2.3 Problem 3

Priors help to incorporate believes about the real parameter distribution and the domain they possible can stem from. Priors help to get more robust reliable results for the estimated parameters and give a way to push the interpretation of the calibration, since the outcome is limited properly beforehand. Further, priors give the analytic foundation for the Baysian methods. Without priors it would be impossible to draw randomly the model parameters in a more or less analytic manner.

2.4 Problem 4

A implementation of the estimation can be found in the *AnScho.mod* file.

2.5 Problem 5

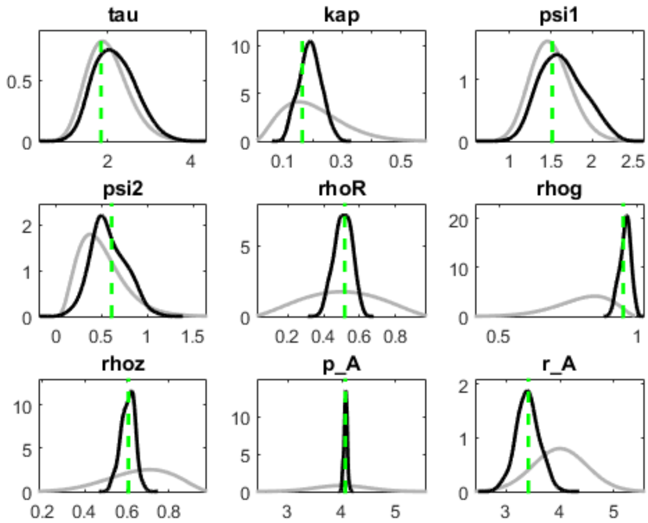

Abbildung 4: Priors vs. Posteriors

Overall the domain for the priors seem to be well chosen since the domain of the posterior is in all cases contained in the domain of the priors. However for some parameters the type of distribution chosen for the priors seems not to be the right one. This becomes apparent if the tails of the prior and posterior distributions are compared. For example, in the cases of **kap**, **rhoz** and **stdg** the tails of the posterior distributions are way smaller than the one of the prior. This indicates a more symmetrical distribution than expected and a normal distributed prior may yield a better fit.

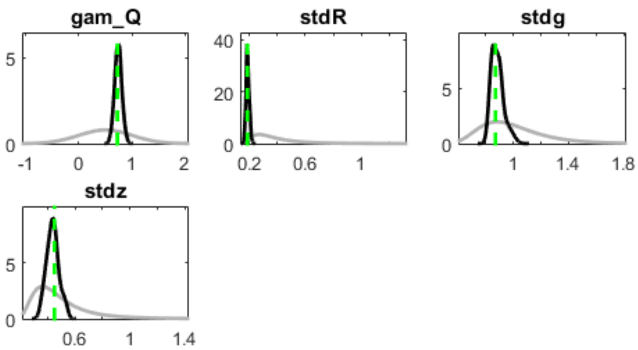

Abbildung 5: Priors vs. Posteriors