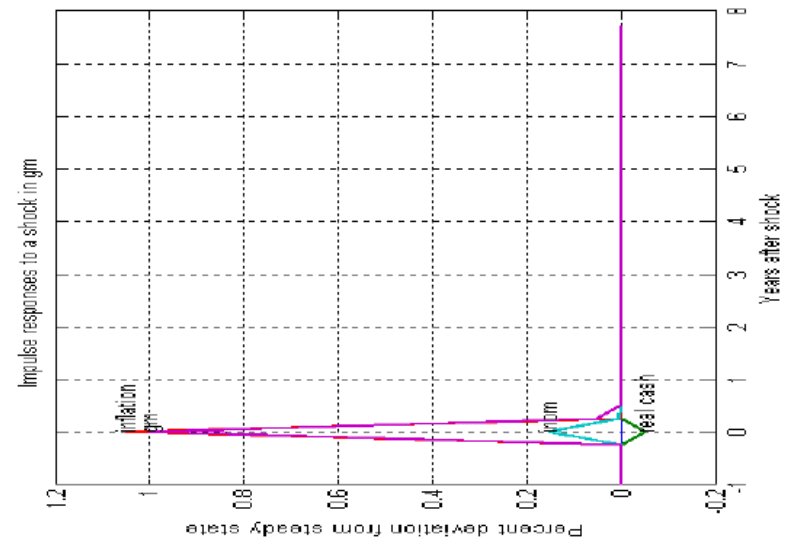
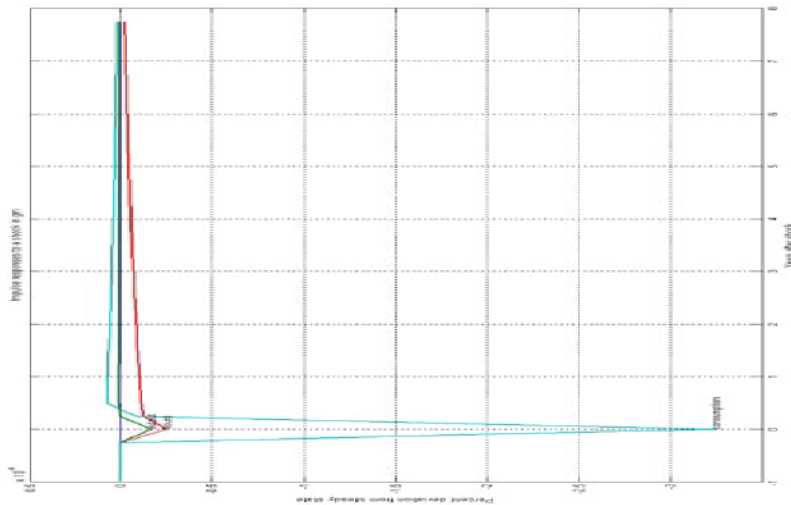


Addendum to Handout for Macro 3 EUI 2009 Lecture 3

The Effects of Money Growth Rate Shocks in a MIU model

- Assume the following calibration: $\beta = 0.99$, $n^{ss} = 0.25$, $\alpha = 0.35$
- Experiment 1: $b = 3 > \theta = 2$, $d = 1$, $\rho_m = 0.05$
- Experiment 2: $b = 3 < \theta = 5$, $d = 1$, $\rho_m = 0.05$
- Experiment 3: $b = 3 < \theta = 5$, $d = 1$, $\rho_m = 0.95$
- Experiment 4: $b = 3 < \theta = 5$, $d = 2$, $\rho_m = 0.95$
- Experiment 5 (realistic): $b = 1/0.39 < \theta = 5$, $d = 5$, $\rho_m = 0.68$

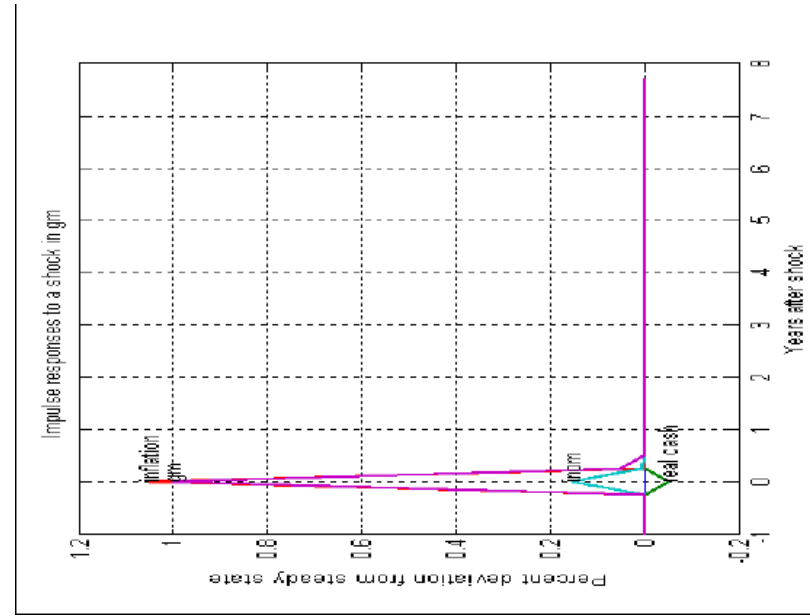
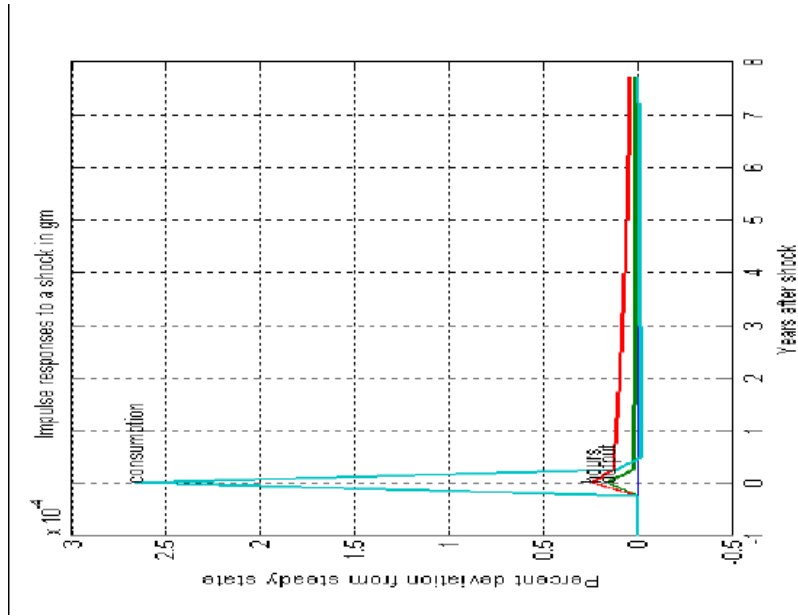
Experiment 1



- When $b > \theta$: Money growth rate expansion leads to a decline in hours, consumption and output
- Nominal interest rate rises - leads to a decline in real balances

- Inflation rate increases immediately
- The effects on output, consumption and hours are **very** small

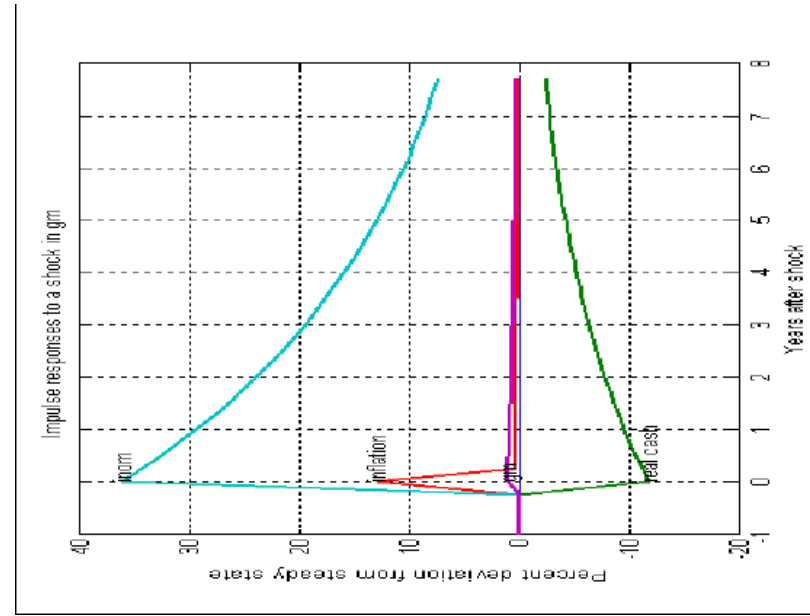
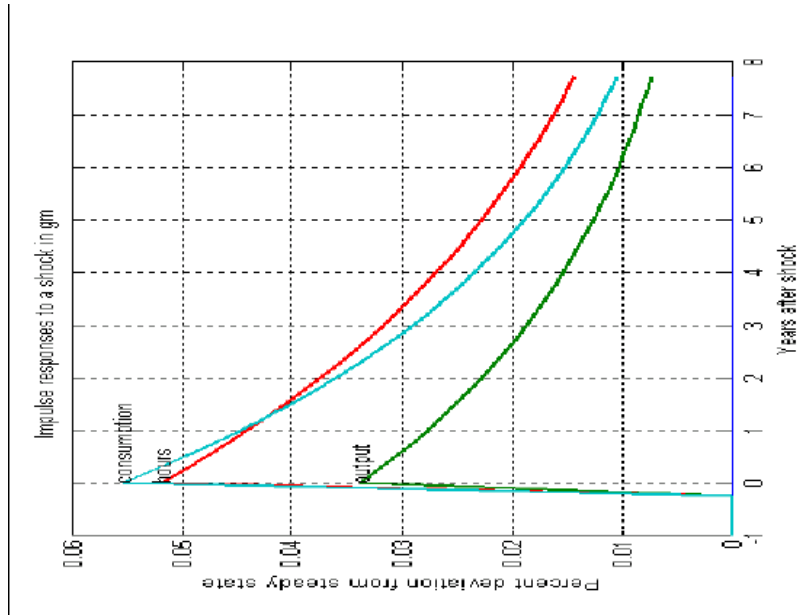
Experiment 2



- When $b < \theta$: Money growth rate expansion leads to an increase in hours, consumption and output
- Nominal interest rate rises - leads to a decline in real balances

- Inflation rate increases immediately
- The effects on output, consumption and hours are **very** small

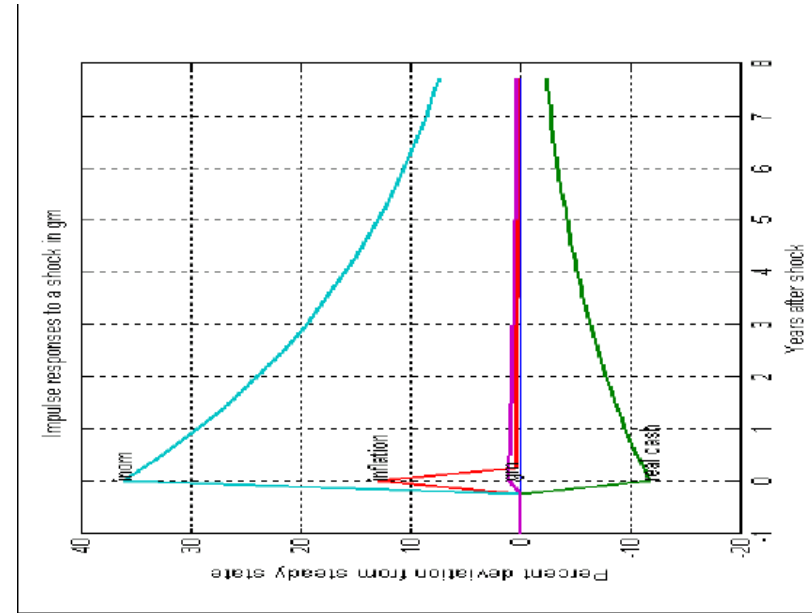
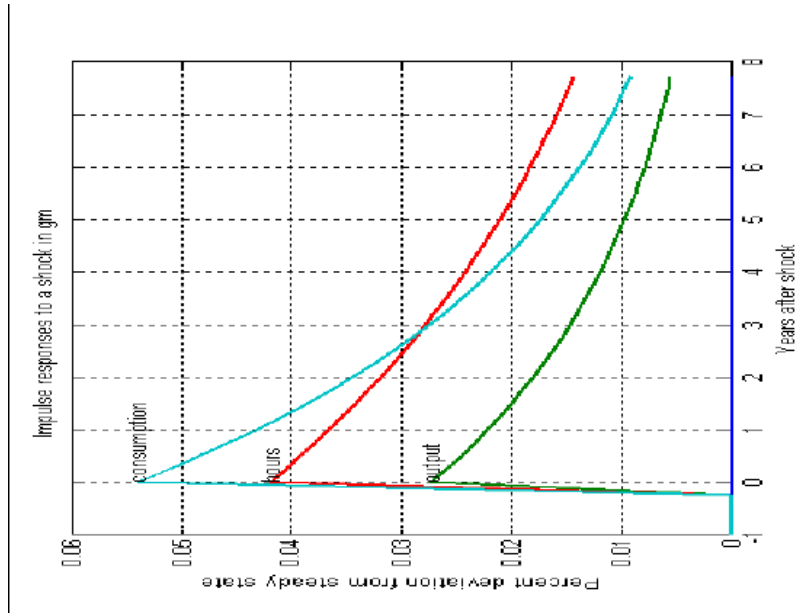
Experiment 3



- More persistent money growth rate shock leads to larger effects
- Nominal interest rates rise much more because future expected money growth rises more

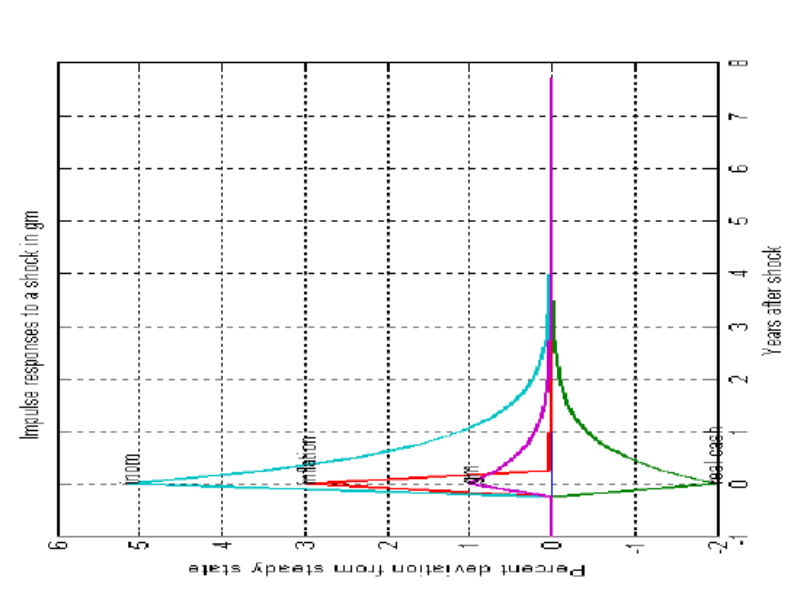
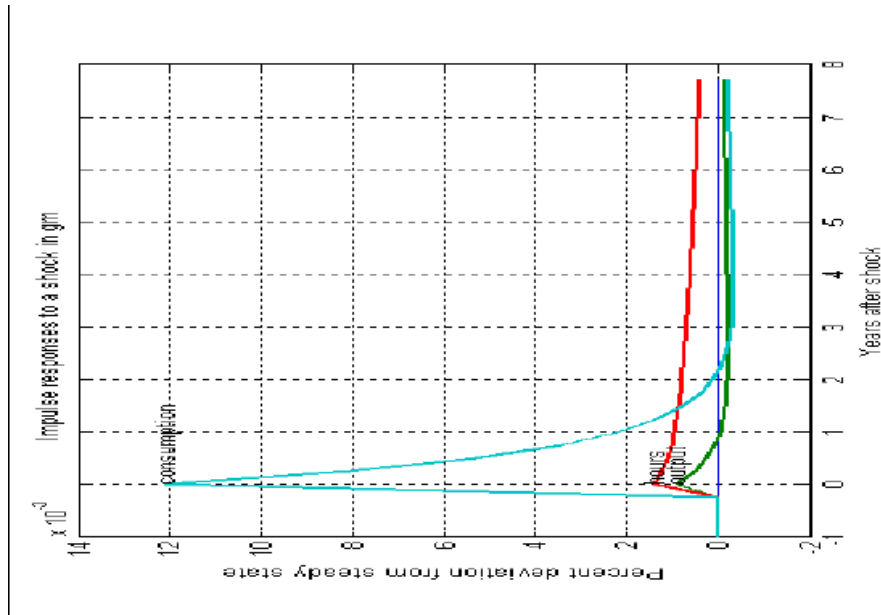
- However: The shock is also much larger - we examine the effects of a 1 percent rise in the money growth rate. The accumulated effect is $1/0.95$ when money growth rate persistence is 0.05 and it is $1/0.05$ when money growth rate persistence is 0.95. Thus to compare experiments 2 and 3 one need to scale down the latter by a factor of 19.

Experiment 4



- When d increases, labor supply elasticity goes down - smaller effects on hours worked and output

Experiment 5



- Realistic case: Calibration of Chari, Kehoe and McGrattan, ReStud, 2001
- Realistic case has $b < \theta$, high value of d , and intermediate value of money growth rate persistence

- Conclusions:

1. The real effects of money growth rate shocks are minute when prices are flexible and there are no other frictions
2. Lack of a liquidity effect: Nominal interest rates rise in response to monetary expansion
3. Large and immediate effects of monetary shocks on inflation