Empirical Methods for Macroeconomics,

Christiano

VAR Exercise

Analyzing the effect of a monetary policy shock using VARs

Objective: In this assignment, you will reproduce some VAR-based results in the literature and asses their sensitivity to various auxiliary assumptions. Please refer to the last page of this assignment for a description of the MATLAB files and variables contained in the VAR.

1. [(1)]

2. Using the MATLAB file assignment1.m, estimate the dynamic effects of a shock to the federal funds rate. Impose the recursiveness assumption discussed in class that all time t quantity variables (except for volatility) and inflation do not respond contemporaneously to a monetary policy shock. Set the lag length in the VAR to 4 and use the sample period 1959Q1-2004Q4. Plot the impulse response functions and discuss the share of the k-step ahead forecast error variance accounted for by the monetary policy shock for $k = 1, 5, 10$ and 20 quarters (the shock occurs at $k = 1$).

3. Redo (1) setting the lag length in the VAR to 2. Does this make a difference to inference?

4. Redo (1) under the assumption that the Fed does not see the time t quantity variables (i.e. it sees only inflation) and that these variables can respond to a time t monetary policy shock. Use a lag length of 4 quarters. Discuss the difference in how real GDP responds to a monetary policy shock.

5. Redo (1) starting the sample period in 1983Q1. Discuss what difference this makes to the response to a monetary policy shock for the variables in the system.

6. Consider again the VAR as specified in (1). Estimate the dynamic effects of a neutral and capital-embodied technology shock at the same time as you estimate the effect of a monetary policy shock. Use the identifying assumptions that (i) the only shocks which affect the long-run level of labor productivity are the two technology shocks and (ii) the only shock which affects the long-run price of investment is a capital-embodied shock.

7. Redo (5) but instead of including the level of hours worked in the VAR, include the growth rate of hours worked. Does this make a difference to inference?

8. Redo (5) but do not impose the assumption needed to estimate the effects of a monetary policy shock. Does this make a difference to inference about the effects of technology shocks?

9. Redo (5) but without estimating the effect of a capital-embodied shock.

10. Does this make a difference to inference about the effects of a monetary policy shock or a neutral technology shock?

11. The original sample form ACEL was only going back to 2001Q4. Redo (5) using the original data sets main4data.mat and invprice.mat. How do the impulse responses compare to those obtained using the longer sample? What can you conclude about the robustness of your results for the three types of shocks?