

Estimation, Solution and Analysis of Equilibrium Monetary Models
Teusday, November 2, 2004
Assignment 1

Objective: In this assignment, you will reproduce some VAR based results in the literature and assess 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. Using the MATLAB file `assignment1.m`, estimate the dynamic effects of a shock to the federal funds rate. (In particular, do not include in the estimation the response to the technology shocks.) Impose the recursiveness assumption discussed in class that all time t quantity variables (except for velocity) 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 1959:1 - 2001:4. 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 $k = 1$).
2. Redo (1) setting the lag length in the VAR to 2. Does this make a difference to inference?
3. 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.
4. Redo (1) starting the sample period in 1983:1. Discuss what difference this makes to the response to a monetary policy shock for the variables in the system.
5. 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 effects 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.

6. Redo (5) but instead of including hours worked in the VAR, include the growth rate of hours worked. Does this make a difference to inference?
7. 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?
8. Redo (5) but without estimating the effect of a capital embodied shock. Does this make a difference to inference about the effects of a monetary policy shock or a neutral technology shock?

Description of the files

The file `assignment1.m` contains all the commands you need. You can change various auxiliary assumptions (lag length, sample period, hours in difference or growth rate, ...) by simply changing the values of the parameters controlling the computations at the beginning of the file. Other files appearing in the same directory as `assignment1.m` contain the data, as well as routines used to produce the results.

Description of the variables

The variables included in the baseline specification are, in order of appearance:

$\Delta(Y/H)$	Growth in labor productivity
H	Hours worked per capita
ΔP	Inflation
C/Y	Consumption divided by output
I/Y	Investment divided by output
U	Capital utilization
$Y/(WH)$	Output to labor compensation
FF	Federal funds rate
V	M2 velocity

In addition, the user can add the growth in the real price of investment, ΔP_I , by setting the variable `ISShock = 1`. The variable ΔP_I then enters the VAR in first position by default.