

Econ 510: Applied Econometrics for Macro  
Assignment 3

**VAR Modelling**

**Due Date: In class, April 21, 2008**

In this exercise you will collect some data and estimate a VAR/VEC for the US and a small open economy (Australia).

**Question 1**

Collect quarterly data on the following three variables for the period 1960Q1-2006Q4:

1. output (real GDP)
2. prices (GDP deflator)
3. money supply (M2 or M3)

Use this data to build a VAR(p) model. In particular I want you to do the following for each country:

- (a) Test to see if each variable contains a unit root or not.
- (b) If all variables have a unit root then check to see if they are co-integrated.
- (c) Depending on your results in parts (a) and (b) build an appropriate VAR/DVAR/VEC model of the data.
- (d) Use this model to construct structural impulse response functions where the structural shocks can be interpreted as a money shock, an aggregate supply shock, and an aggregate demand shock. Use the method described in your text to construct bootstrapped confidence intervals for these structural impulse response functions.

**IMPORTANT NOTE** I would like you to very carefully describe the identifying restrictions you use and describe how you implemented them.

## Question 2

Collect quarterly observations on the following five variables for the period 1972Q1-2006Q4:

1. log of consumer prices for Australia
2. log of consumer prices for the United States
3. log of the exchange rate between the US and Australia (measured as the price of Australian dollars in US dollars)
4. log of the five year treasury bond for Australia
5. log of the five year treasury bond for the United States

(a) Assume that each series has a unit root. I want you to test for the presence of co-integration between these variables for a VAR with 2 lags. (That is, the VEC will have 1 lag)

Show all your working.

NOTE: Include a constant and seasonal dummy variables in your  $D_t$  matrix.

(b) Can you structurally identify any of the relationships? Do the restrictions make sense empirically?