ECONOMICS 8346, Fall 2011
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Homework 4. Wednesday, September 21—due Wednesday, September 28.

1. a) Calculate and plot (by hand) the impulse response functions for the model

$$\begin{pmatrix} x_{1t} \\ x_{2t} \end{pmatrix} = \begin{pmatrix} u_{1t} \\ u_{2t} \end{pmatrix} + \begin{pmatrix} 1 & .5 \\ .3 & .2 \end{pmatrix} \begin{pmatrix} u_{1t-1} \\ u_{2t-1} \end{pmatrix} + \begin{pmatrix} 1 & 2 \\ 0 & .5 \end{pmatrix} \begin{pmatrix} u_{1t-2} \\ u_{2t-2} \end{pmatrix}$$

where the error terms are independent. If the variance of u_1 is 1 and the variance of u_2 is 2, and u_1 and u_2 are independent calculate the variance decomposition for x_1.

b) Also, plot (I suggest using GAUSS or MATLAB) the impulse response functions for

$$\begin{pmatrix} x_{1t} \\ x_{2t} \end{pmatrix} = \begin{pmatrix} .5 & 0 \\ .3 & .2 \end{pmatrix} \begin{pmatrix} x_{1t-1} \\ x_{2t-1} \end{pmatrix} + \begin{pmatrix} u_{1t} \\ u_{2t} \end{pmatrix}$$

c) And calculate the variance decompositions (at different frequencies) for x_1 when

$$\begin{pmatrix} x_{1t} \\ x_{2t} \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 1 & 2 \end{pmatrix} \begin{pmatrix} u_{1t} \\ u_{2t} \end{pmatrix} + \begin{pmatrix} 1 & .5 \\ .3 & .2 \end{pmatrix} \begin{pmatrix} u_{1t-1} \\ u_{2t-1} \end{pmatrix} + \begin{pmatrix} 1 & 2 \\ 0 & .5 \end{pmatrix} \begin{pmatrix} u_{1t-2} \\ u_{2t-2} \end{pmatrix}$$

where u_1 and u_2 now are independent with variance 1.

2. Discuss a paper using a structural VAR model (write about a half page). Focus on whether you think the interpretation of residuals as structural shocks is reasonable. One suggestion is "The Fed and Interest Rates–A High-Frequency Identification" by Cochrane and Piazessi (2002) *American Economic Review*, 92, 90–95. (I mainly picked this one because it is short, besides being in a top journal.) It is available in JSTOR.