ECONOMICS 7395, Spring 2007
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Homework 4. February 20—due February 26.

Calculate and plot 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.

Also, calculate the impulse response functions for

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

Finally, calculate the variance decomposition 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.