Tord Sture Stangeland

EC422

Project 7

Problem 1:

a)

**Code**:

CALENDAR(M) 1972:1

ALLOCATE 2018:3

DATA(FORMAT=FRED) \* \* MCUMFN HOUST USREC

GRAPH(STYLE=LINE,OVERLAY=1,SHADING=USREC,HEADER="Data",KEY=BELOW) 2

# MCUMFN

# HOUST

**Charts**:



**Answer**:

The data are remarkably similar. They both show peaks and throughs in similar areas and are both affected similarily in recessions. I would therefore, based on visual inputs agree to some extent that “housing IS the business cycle”. However, in the 2001 recession, HOUST does not seem equally affected, leaving me uncertain.

b)

**Code**:

@VARLagSelect(LAGS=24, CRIT=AIC) \* \*

# MCUMFN HOUST

SYSTEM(MODEL=STARTSVAR)

VARIABLES HOUST MCUMFN

LAGS 1 TO 5

DET CONSTANT

END(SYSTEM)

ESTIMATE(OUTSIGMA=OMEGA3) 1984:1 2015:12

**Answer**:

My null hypothesis for the test is that first HOUST does not Granger cause MCUMFN, and then that MCUMFN does not Granger cause HOUST. My results were for the first test a p-value of: 0.033, and for the second p-value: 0.9. So I reject the null hypothesis that HOUST does not cause MCUMFN, meaning that housing starts do Granger cause manufacturing, but I retain my null of MCUMFN not Granger causing HOUST. My lag length used was 5.

c)

**Code**:

COMPUTE IMPLABEL = ||"Starts","Manufacturing"||

@MONTEVAR(MODEL=STARTSVAR,VARLABELS=IMPLABEL,SHOCKLABELS=IMPLABEL,HEADER="Impulse Response Functions")

**Chart**:



Answer: In the (1,1) spot you can see how a unit impulse or a shock of the error term of one standard deviation affects HOUST over time. The effect is positive for over 50 periods, and slowly declining. In the (2,1) spot you can see how a unit impulse affects manufacturing. The response is that it increases until period 11, where it then starts to decline, remaining positive for 50+ periods. In the (1,2) frame you can see the effect of HOUST from a unit impulse of manufacturing. The effect is slightly positive for the first 10 periods and then negative for the next 50 periods, slowly increasing in gradient, but still negative. In the final (2,2) frame you can see the effect of a unit shock of manufacturing to manufacturing. Initially the effect is around .4 for the first period, then rapidly increasing to its max of .8 in period 9, after which it slowly declines towards 0 for the next 50 periods.

d)

**Code**:

FORECAST(MODEL=STARTSVAR,FROM=1984:1,TO=2017:12,RESULTS=FORE,STDERRORS=SERRORS)

\*

SET UPPER1 1984:1 2017:12 = FORE(1)+1.96\*SERRORS(1)

SET LOWER1 1984:1 2017:12 = FORE(1)-1.96\*SERRORS(1)

\*

SET UPPER2 1984:1 2017:12 = FORE(2)+1.96\*SERRORS(2)

SET LOWER2 1984:1 2017:12 = FORE(2)-1.96\*SERRORS(2)

\*

GRAPH(SHADING=USREC,PATTERNS,STYLE=LINE,HEADER="Housing Starts", SUBHEADER="Forecast: 1984:1 2017:12") 4

# HOUST 1984:1 2017:12

# FORE(1) 1984:1 2017:12

# UPPER1 1984:1 2017:12

# LOWER1 1984:1 2017:12 3

\*

GRAPH(SHADING=USREC,PATTERNS,STYLE=LINE,HEADER="Manufacturing", SUBHEADER="Forecast: 1984:1 2017:12") 4

# MCUMFN 1984:1 2017:12

# FORE(2) 1984:1 2017:12

# UPPER2 1984:1 2017:12

# LOWER2 1984:1 2017:12 3

**Charts**:Problem 2:

a)

**Code:**

CALENDAR(M) 1990:1

ALL 2018:2

DATA(FORMAT=FRED) \* \* USREC TEMPHELPS PAYEMS

GRAPH(STYLE=LINE,OVERLAY=1,SHADING=USREC,HEADER="Data",KEY=BELOW) 2

# TEMPHELPS

# PAYEMS

NOTE: My border lines stopped being cooperative here, so please disregard how it looks.

**Chart**:

**Answer:**

The two data sets follow similar patterns. When TEMPHELPS start to go down, PAYEMS follow after, therefore it does seem like TEMPHELPS is a useful leading indicator.

b)

**Code:**

SET DPAY = PAYEMS-PAYEMS{1}

SET DHELP = TEMPHELPS-TEMPHELPS{1}

GRAPH(STYLE=LINE,OVERLAY=1,SHADING=USREC,HEADER="First difference data",KEY=BELOW) 2

# DPAY

# DHELP

**Charts:**



c)

**Code:**

\*Assuming the question wants me to use first difference data

@VARLagSelect(LAGS=19, CRIT=HQ) \* \*

# DHELP DPAY

SYSTEM(MODEL=STARTSVAR)

VARIABLES DPAY DHELP

LAGS 1 TO 3

DET CONSTANT

END(SYSTEM)

ESTIMATE(OUTSIGMA=OMEGA3) 1990:1 2015:12

**Answer**:

Since the instructions were unclear whether or not to use the first difference data or the actual data, I assumed (linearity from b to c) that I would use first difference data for this. My null hypotheses are that DPAY does not granger cause DHELP and that DHELP does not granger cause DPAY. My results for the first test is p-value=0.001, telling me to reject the null hypothesis and thus assume that DHELP does granger cause DPAY. The second test of whether DPAY granger cause DHELP gave me a p-value of .33, meaning that I can not reject the null of DPAY not granger causing DHELP. This makes sense as DHELP should granger cause DPAY and not the other way around if DHELP is a leading indicator.

d)

**Code**:

COMPUTE IMPLABEL = ||"DPAY","DHELP"||

@MONTEVAR(MODEL=STARTSVAR,VARLABELS=IMPLABEL,SHOCKLABELS=IMPLABEL,HEADER="Impulse Response Functions")

**Charts**:



**Answer**:

The (1,1) graph shows the effect of a unit impulse of DPAY on DPAY. The effect is very strong and has an absolute max in the first period, and decreases rapidly in the second period, then increases again to a relative max in period 4, after which it slowly declines towards 0 until period 38 in which the response is 0, and continues at 0. The (1,2) graph shows the effect of a unit impulse of DHELP on DPAY, starting of at 0 in period one, maxing out in period 6, after which the response slowly declines to 0 until period 38, after which the value is 0. The (2,1) graph shows the effect of a unit impulse of DPAY on DHELP. This value starts of with a max in period 0, dropping down to 5 for period 1 and 2, then taking a step down again in period 3, staying constant until period 4, after which slowly declines towards 0. The (2,2) graph shows the effect of a unit impulse of DHELP on DPAY. The response is maxed in period 0, then rapidly diving in period 1, jumping up slightly in period 2, then slowly declining towards 0 in the following periods.

e)

**Code**:

FORECAST(MODEL=STARTSVAR,FROM=2018:2,TO=2020:2,RESULTS=FORE,STDERRORS=SERRORS)

\*

SET UPPER1 2018:2 2020:2 = FORE(1)+1.96\*SERRORS(1)

SET LOWER1 2018:2 2020:2 = FORE(1)-1.96\*SERRORS(1)

\*

SET UPPER2 2018:2 2020:2 = FORE(2)+1.96\*SERRORS(2)

SET LOWER2 2018:2 2020:2 = FORE(2)-1.96\*SERRORS(2)

\*

GRAPH(SHADING=USREC,PATTERNS,STYLE=LINE,HEADER="DPAY", SUBHEADER="Forecast: 2018:2 2020:2") 4

# DPAY 1990:1 2018:2

# FORE(1) 2018:2 2020:2

# UPPER1 2018:2 2020:2

# LOWER1 2018:2 2020:2 3

\*

GRAPH(SHADING=USREC,PATTERNS,STYLE=LINE,HEADER="DHELP", SUBHEADER="Forecast: 2018:2 2020:2") 4

# DHELP 1990:1 2018:2

# FORE(2) 2018:2 2020:2

# UPPER2 2018:2 2020:2

# LOWER2 2018:2 2020:2 3

**Charts**:



