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Assign6_Thunyaporn.R

CHATKEAWPAISAL

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```
setwd("/Users/CHATKEAWPAISAL/Desktop/4 term 2/EE435/6")
cat(rep("\n", 50))

library(quantmod)

## Warning: package 'quantmod' was built under R version 4.0.5

## Loading required package: xts

## Loading required package: zoo

##
## Attaching package: 'zoo'

## The following objects are masked from 'package:base':
##
##     as.Date, as.Date.numeric

## Loading required package: TTR

## Registered S3 method overwritten by 'quantmod':
##   method            from
##   as.zoo.data.frame zoo

library(fBasics)

## Warning: package 'fBasics' was built under R version 4.0.5

## Loading required package: timeDate

## Loading required package: timeSeries

##
## Attaching package: 'timeSeries'

## The following object is masked from 'package:zoo':
##
##     time<-

##
## Attaching package: 'fBasics'

## The following object is masked from 'package:TTR':
##
##     volatility
```

```
library(sn)

## Warning: package 'sn' was built under R version 4.0.5

## Loading required package: stats4

##
## Attaching package: 'sn'

## The following objects are masked from 'package:fBasics':
##
##     tr, vech

## The following object is masked from 'package:stats':
##
##     sd

library(PerformanceAnalytics)

## Warning: package 'PerformanceAnalytics' was built under R version 4.0.5

##
## Attaching package: 'PerformanceAnalytics'

## The following objects are masked from 'package:timeDate':
##
##     kurtosis, skewness

## The following object is masked from 'package:graphics':
##
##     legend

library(car)

## Warning: package 'car' was built under R version 4.0.5

## Loading required package: carData

##
## Attaching package: 'car'

## The following object is masked from 'package:fBasics':
##
##     densityPlot

library(tseries)

## Warning: package 'tseries' was built under R version 4.0.5

library(forecast)

## Warning: package 'forecast' was built under R version 4.0.5

library(fGarch)
```

```
## Warning: package 'fGarch' was built under R version 4.0.5
```

```
#install.packages("fUnitRoots")
library(fUnitRoots)
```

```
## Warning: package 'fUnitRoots' was built under R version 4.0.5
```

```
#install.packages('MTS')
require(MTS)
```

```
## Loading required package: MTS
```

```
## Warning: package 'MTS' was built under R version 4.0.5
```

```
##
## Attaching package: 'MTS'
```

```
## The following object is masked from 'package:TTR':
##
##     VMA
```

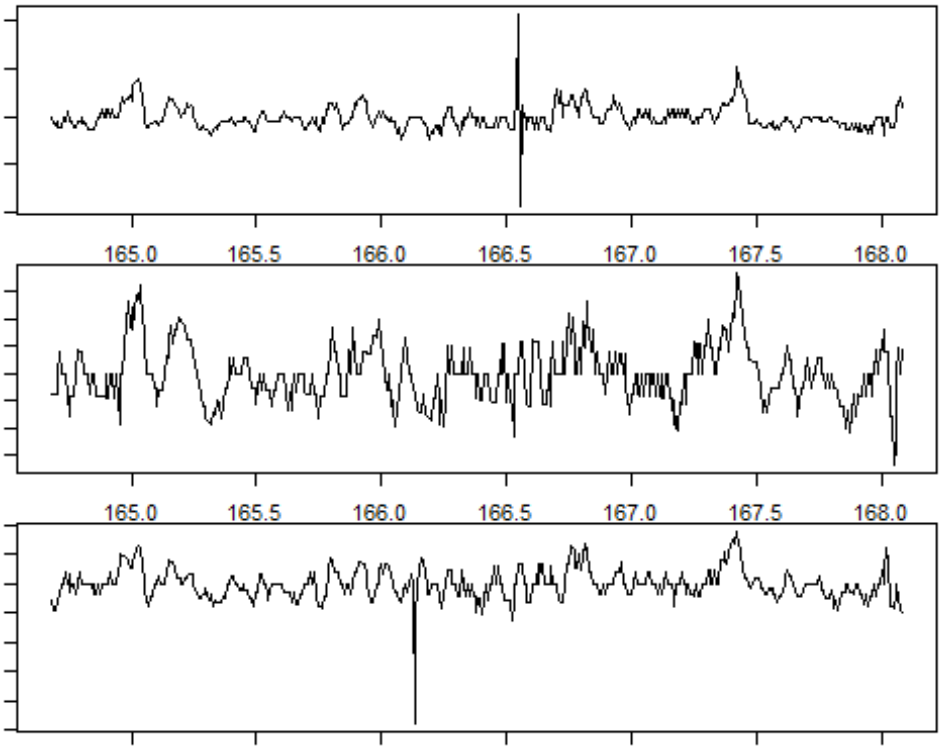
```
da=read.table("m-unrate-MIILIN.txt",header=T)
head(da)
```

```
##        Mon   MI  IL  IN
## 1 1976.083 10.0 6.9 7.0
## 2 1976.167 10.0 6.8 6.8
## 3 1976.250  9.9 6.7 6.5
## 4 1976.333  9.7 6.6 6.2
## 5 1976.417  9.6 6.5 6.0
## 6 1976.500  9.4 6.5 5.8
```

```
x=cbind(da[,2],da[,3],da[,4])
x=log(x)
zt=diffM(x)*100
colnames(zt)=c("MI","IL","IN")
tdx=da[,1]/12
dim(da)
```

```
## [1] 492   4
```

```
par(mar=c(1,1,1,1))
MTSplot(zt,tdx[2:492])
```




```
VARorder(zt)

## selected order: aic =  6
## selected order: bic =  2
## selected order: hq =  6
## Summary table:
##        p    AIC    BIC     HQ     M(p) p-value
##  [1,]  0 4.5902 4.5902 4.5902   0.0000  0.0000
##  [2,]  1 3.1019 3.1788 3.1321 722.0353  0.0000
##  [3,]  2 2.9686 3.1225 3.0290  79.9726  0.0000
##  [4,]  3 2.9328 3.1636 3.0234  33.8750  0.0001
##  [5,]  4 2.9217 3.2294 3.0426  22.1688  0.0084
##  [6,]  5 2.9188 3.3034 3.0699  18.2649  0.0322
##  [7,]  6 2.8417 3.3033 3.0230  52.1535  0.0000
##  [8,]  7 2.8516 3.3900 3.0630  12.2266  0.2008
##  [9,]  8 2.8797 3.4951 3.1214   3.8389  0.9217
## [10,]  9 2.8736 3.5659 3.1455  19.2322  0.0233
## [11,] 10 2.8648 3.6340 3.1668  20.3222  0.0160
## [12,] 11 2.8775 3.7237 3.2098  10.5898  0.3049
## [13,] 12 2.8935 3.8165 3.2560   9.1179  0.4265
## [14,] 13 2.9094 3.9094 3.3021   9.0746  0.4304

m1=VAR(zt,2)

## Constant term:
## Estimates:  -0.04308488 0.02069438 -0.01722694
## Std.Error:  0.08968027 0.05526058 0.08400675
```

```
## AR coefficient matrix
## AR( 1 )-matrix
##       [,1]  [,2]  [,3]
## [1,] 0.199 0.276 0.131
## [2,] 0.106 0.528 0.101
## [3,] 0.151 0.274 0.568
## standard error
##        [,1]   [,2]   [,3]
## [1,] 0.0445 0.0735 0.0497
## [2,] 0.0274 0.0453 0.0306
## [3,] 0.0417 0.0689 0.0466
## AR( 2 )-matrix
##          [,1]   [,2]     [,3]
## [1,]  0.30910 -0.106  0.00562
## [2,]  0.04956  0.183 -0.08484
## [3,] -0.00612 -0.170  0.01388
## standard error
##        [,1]   [,2]   [,3]
## [1,] 0.0454 0.0720 0.0501
## [2,] 0.0280 0.0444 0.0309
## [3,] 0.0425 0.0675 0.0470
##
## Residuals cov-mtx:
##           [,1]      [,2]      [,3]
## [1,] 3.8551679 0.3071579 0.7144333
## [2,] 0.3071579 1.4637954 0.4019971
## [3,] 0.7144333 0.4019971 3.3828113
##
## det(SSE) =  17.57694
## AIC =  2.939907
## BIC =  3.093748
## HQ  =  3.000321

m2=refVAR(m1,thres=1.645)

## Constant term:
## Estimates:  0 0 0
## Std.Error:  0 0 0
## AR coefficient matrix
## AR( 1 )-matrix
##       [,1]  [,2]  [,3]
## [1,] 0.192 0.206 0.130
## [2,] 0.105 0.528 0.101
## [3,] 0.152 0.273 0.574
## standard error
##        [,1]   [,2]   [,3]
## [1,] 0.0441 0.0563 0.0427
## [2,] 0.0274 0.0453 0.0306
## [3,] 0.0405 0.0678 0.0392
## AR( 2 )-matrix
```

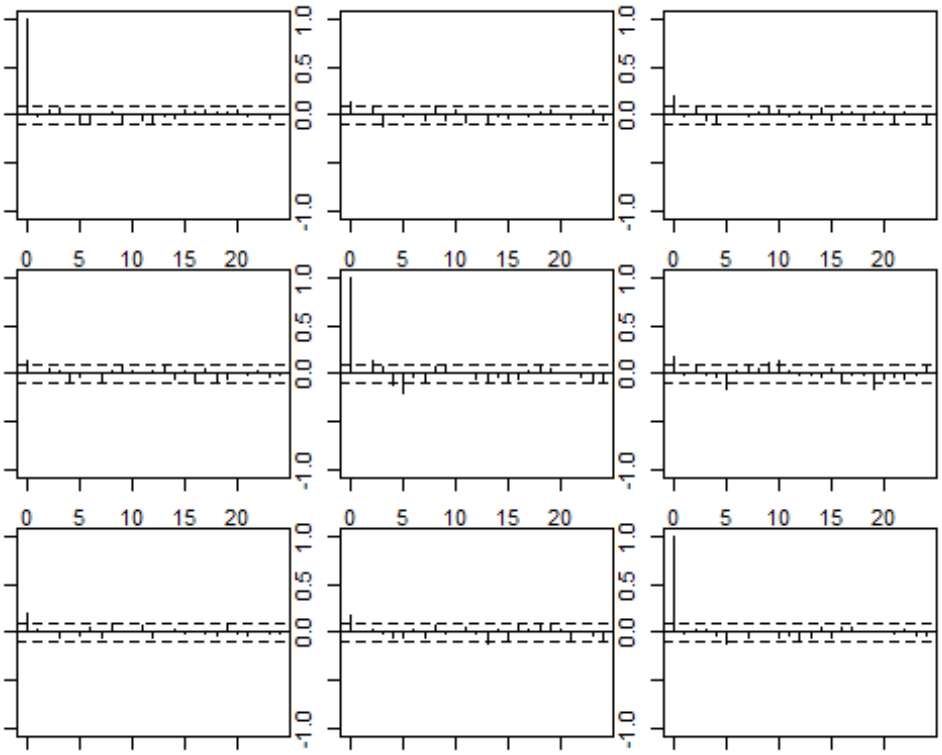
```
##        [,1]   [,2]    [,3]
## [1,] 0.3035  0.000  0.0000
## [2,] 0.0491  0.183 -0.0849
## [3,] 0.0000 -0.168  0.0000
## standard error
##        [,1]   [,2]   [,3]
## [1,] 0.0444 0.0000 0.0000
## [2,] 0.0279 0.0443 0.0309
## [3,] 0.0000 0.0661 0.0000
##
## Residuals cov-mtx:
##           [,1]      [,2]      [,3]
## [1,] 3.8745260 0.3062712 0.7153133
## [2,] 0.3062712 1.4642213 0.4016425
## [3,] 0.7153133 0.4016425 3.3837769
##
## det(SSE) =  17.68107
## AIC =  2.929521
## BIC =  3.049175
## HQ  =  2.976509
```

```
MTSdiag(m1)
```

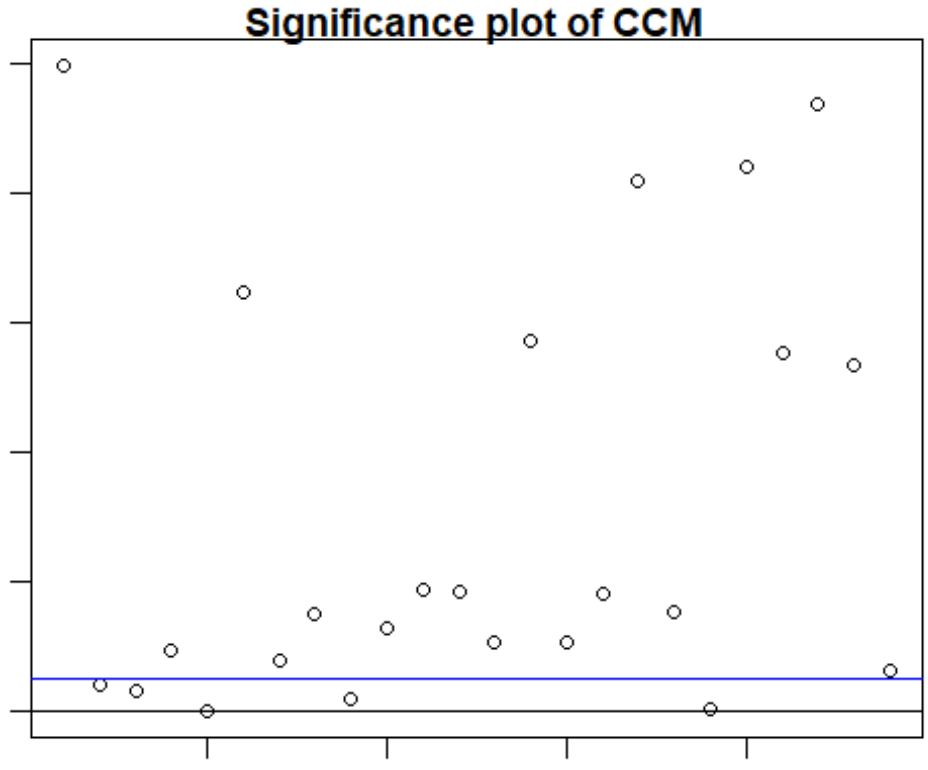
```
## [1] "Covariance matrix:"
##       MI    IL    IN
## MI 3.863 0.308 0.716
## IL 0.308 1.467 0.403
## IN 0.716 0.403 3.390
## CCM at lag:  0
##       [,1]  [,2]  [,3]
## [1,] 1.000 0.129 0.198
## [2,] 0.129 1.000 0.181
## [3,] 0.198 0.181 1.000
## Simplified matrix:
## CCM at lag:  1
## . . .
## . . .
## . . .
## CCM at lag:  2
## . + .
## . + .
## . . .
## CCM at lag:  3
## . - .
## . . .
## . . .
## CCM at lag:  4
## . . .
## . - .
## . . .
```

```
## CCM at lag:  5
## - . .
## . - -
## . . -
## CCM at lag:  6
## . . .
## . . .
## . . .
## CCM at lag:  7
## . . .
## . . .
## . . .
## CCM at lag:  8
## . + .
## . . .
## + . .
## CCM at lag:  9
## . . +
## . . +
## . . .
## CCM at lag:  10
## . . .
## . . +
## . . .
## CCM at lag:  11
## . . .
## . . .
## . . .
## CCM at lag:  12
## - . .
## . . .
## . . .
## CCM at lag:  13
## . . .
## . . .
## . - .
## CCM at lag:  14
## . . .
## . . .
## . . .
## CCM at lag:  15
## . . .
## . - .
## . - .
## CCM at lag:  16
## . . .
## . . .
## . . .
## CCM at lag:  17
## . . .
```

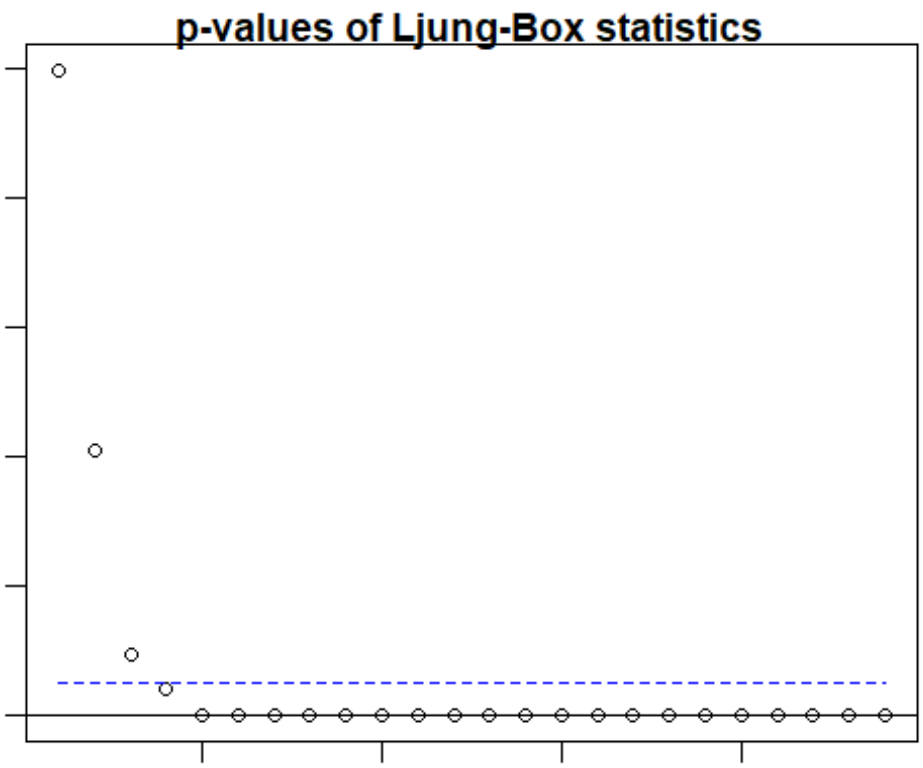
```
## . . .
## . . .
## CCM at lag:  18
## . . .
## . . .
## . + .
## CCM at lag:  19
## . . .
## . . -
## . . .
## CCM at lag:  20
## . . .
## . . .
## . . .
## CCM at lag:  21
## . . -
## . . .
## . . .
## CCM at lag:  22
## . . .
## . . .
## . . .
## CCM at lag:  23
## . . .
## . . .
## . . .
## CCM at lag:  24
## . . .
## . . .
## . . .
```



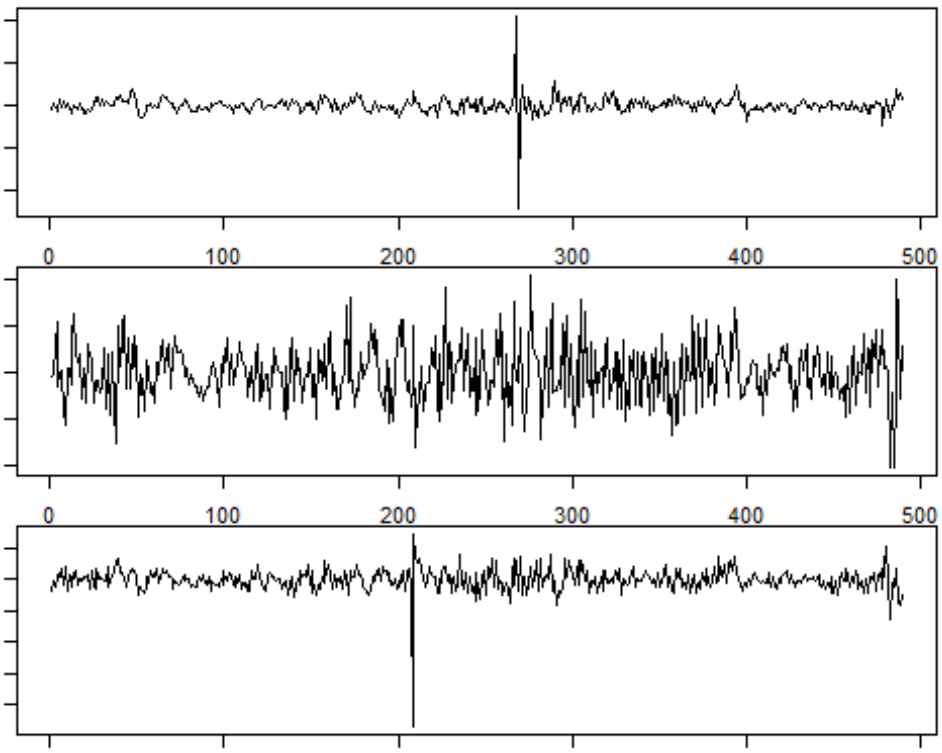

```
## Hit Enter for p-value plot of individual ccm:
```



```
## Hit Enter to compute MQ-statistics:
##
## Ljung-Box Statistics:
##          m       Q(m)     df    p-value
##  [1,]   1.00      1.05    9.00     1.00
##  [2,]   2.00     18.67   18.00     0.41
##  [3,]   3.00     37.04   27.00     0.09
##  [4,]   4.00     52.00   36.00     0.04
##  [5,]   5.00     91.25   45.00     0.00
##  [6,]   6.00     98.16   54.00     0.00
##  [7,]   7.00    113.64   63.00     0.00
##  [8,]   8.00    126.92   72.00     0.00
##  [9,]   9.00    146.75   81.00     0.00
## [10,]  10.00    160.63   90.00     0.00
## [11,]  11.00    173.15   99.00     0.00
## [12,]  12.00    185.71  108.00     0.00
## [13,]  13.00    200.17  117.00     0.00
## [14,]  14.00    207.83  126.00     0.00
## [15,]  15.00    222.28  135.00     0.00
## [16,]  16.00    234.92  144.00     0.00
## [17,]  17.00    240.10  153.00     0.00
## [18,]  18.00    253.31  162.00     0.00
## [19,]  19.00    277.28  171.00     0.00
## [20,]  20.00    282.19  180.00     0.00
## [21,]  21.00    290.01  189.00     0.00
## [22,]  22.00    293.54  198.00     0.00
## [23,]  23.00    301.58  207.00     0.00
## [24,]  24.00    317.81  216.00     0.00
```




```
## Hit Enter to obtain residual plots:
```



```r
#Answer 1.1 The final fitted model

require(vars)

## Loading required package: vars

## Warning: package 'vars' was built under R version 4.0.5

## Loading required package: MASS

## Loading required package: strucchange

## Warning: package 'strucchange' was built under R version 4.0.5

## Loading required package: sandwich

## Loading required package: urca

##
## Attaching package: 'urca'

## The following objects are masked from 'package:fUnitRoots':
##
##     punitroot, qunitroot, unitrootTable

## Loading required package: lmtest

##
## Attaching package: 'vars'

## The following object is masked from 'package:MTS':
##
##     VAR

da=read.table("m-unrate-MIILIN.txt",header=T)
head(da)

##        Mon   MI  IL  IN
## 1 1976.083 10.0 6.9 7.0
## 2 1976.167 10.0 6.8 6.8
## 3 1976.250  9.9 6.7 6.5
## 4 1976.333  9.7 6.6 6.2
## 5 1976.417  9.6 6.5 6.0
## 6 1976.500  9.4 6.5 5.8

x=cbind(da[,2],da[,3],da[,4])
x=log(x)
rt=diff(x)*100
colnames(rt)=c("MI","IL","IN")
varfit=VAR(rt,p=2)
summary(varfit)
```

```
##
## VAR Estimation Results:
## ========================
## Endogenous variables: MI, IL, IN
## Deterministic variables: const
## Sample size: 489
## Log Likelihood: -2782.463
## Roots of the characteristic polynomial:
## 0.8686 0.6789 0.4943 0.4486 0.3738 0.0756
## Call:
## VAR(y = rt, p = 2)
##
##
## Estimation results for equation MI:
## ===================================
## MI = MI.l1 + IL.l1 + IN.l1 + MI.l2 + IL.l2 + IN.l2 + const
##
##        Estimate Std. Error t value Pr(>|t|)
## MI.l1  0.198967   0.044522   4.469 9.81e-06 ***
## IL.l1  0.275604   0.073512   3.749 0.000199 ***
## IN.l1  0.130995   0.049704   2.635 0.008673 **
## MI.l2  0.309097   0.045360   6.814 2.84e-11 ***
## IL.l2 -0.106027   0.072016  -1.472 0.141604
## IN.l2  0.005618   0.050137   0.112 0.910836
## const -0.043085   0.089680  -0.480 0.631141
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Residual standard error: 1.978 on 482 degrees of freedom
## Multiple R-Squared: 0.4075,  Adjusted R-squared: 0.4001
## F-statistic: 55.24 on 6 and 482 DF,  p-value: < 2.2e-16
##
##
## Estimation results for equation IL:
## ===================================
## IL = MI.l1 + IL.l1 + IN.l1 + MI.l2 + IL.l2 + IN.l2 + const
##
##       Estimate Std. Error t value Pr(>|t|)
## MI.l1  0.10580    0.02743   3.856 0.000131 ***
## IL.l1  0.52800    0.04530  11.656  < 2e-16 ***
## IN.l1  0.10090    0.03063   3.294 0.001059 **
## MI.l2  0.04956    0.02795   1.773 0.076841 .
## IL.l2  0.18303    0.04438   4.125 4.37e-05 ***
## IN.l2 -0.08484    0.03089  -2.746 0.006255 **
## const  0.02069    0.05526   0.374 0.708207
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
```

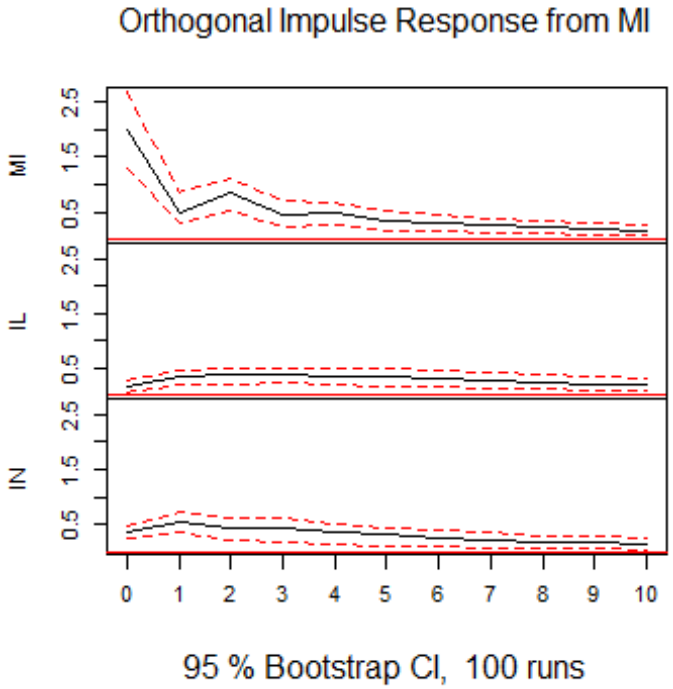
```
## Residual standard error: 1.219 on 482 degrees of freedom
## Multiple R-Squared: 0.6581,  Adjusted R-squared: 0.6539
## F-statistic: 154.7 on 6 and 482 DF,  p-value: < 2.2e-16
##
##
## Estimation results for equation IN:
## ===================================
## IN = MI.l1 + IL.l1 + IN.l1 + MI.l2 + IL.l2 + IN.l2 + const
##
##        Estimate Std. Error t value Pr(>|t|)
## MI.l1  0.151449   0.041706   3.631 0.000312 ***
## IL.l1  0.273801   0.068861   3.976 8.08e-05 ***
## IN.l1  0.568094   0.046560  12.201  < 2e-16 ***
## MI.l2 -0.006117   0.042490  -0.144 0.885584
## IL.l2 -0.169976   0.067460  -2.520 0.012069 *
## IN.l2  0.013880   0.046965   0.296 0.767705
## const -0.017227   0.084007  -0.205 0.837607
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Residual standard error: 1.853 on 482 degrees of freedom
## Multiple R-Squared: 0.5205,  Adjusted R-squared: 0.5145
## F-statistic:  87.2 on 6 and 482 DF,  p-value: < 2.2e-16
##
##
##
## Covariance matrix of residuals:
##        MI     IL     IN
## MI 3.9112 0.3116 0.7248
## IL 0.3116 1.4851 0.4078
## IN 0.7248 0.4078 3.4319
##
## Correlation matrix of residuals:
##        MI     IL     IN
## MI 1.0000 0.1293 0.1978
## IL 0.1293 1.0000 0.1807
## IN 0.1978 0.1807 1.0000

impresp=irf(varfit)
plot(impresp)
```

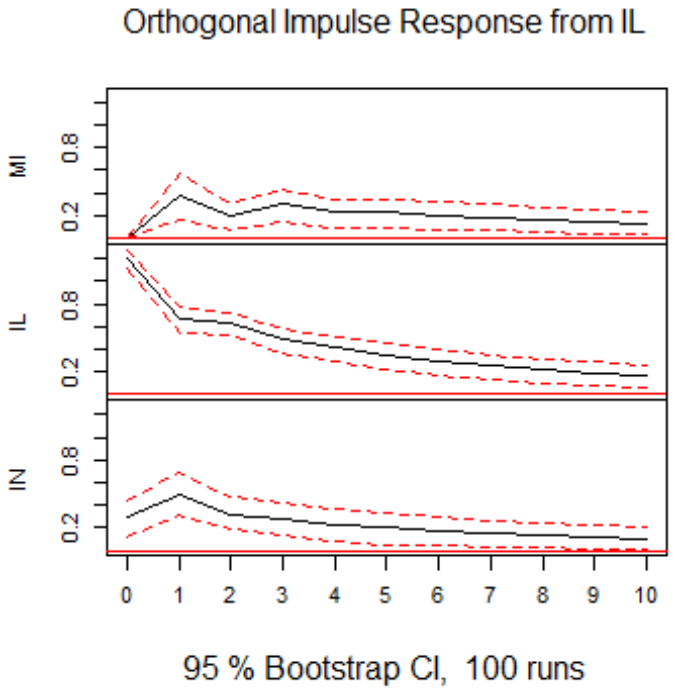
1.1) $\widehat{MI} = \underset{(0.08968)}{-0.043085} + \underset{(0.045)}{0.19897}\,MI_{t-1} + \underset{(0.04536)}{0.3091}\,MI_{t-2} + \underset{(0.0735)}{0.273604}\,IL_{t-1} - \underset{(0.072016)}{0.106027}\,IL_{t-2} + \underset{(0.04497)}{0.130995}\,IN_{t-1} + \underset{(0.0732)}{0.005618}\,IN_{t-2}$

$\widehat{IL} = \underset{(0.055)}{0.02069} + \underset{(0.027643)}{0.1058}\,MI_{t-1} + \underset{(0.02795)}{0.04956}\,MI_{t-2} + \underset{(0.0453)}{0.528}\,IL_{t-1} + \underset{(0.044138)}{0.18803}\,IL_{t-2} + \underset{(0.030617)}{1.009}\,IN_{t-1} - \underset{(0.030389)}{0.0848}\,IN_{t-2}$

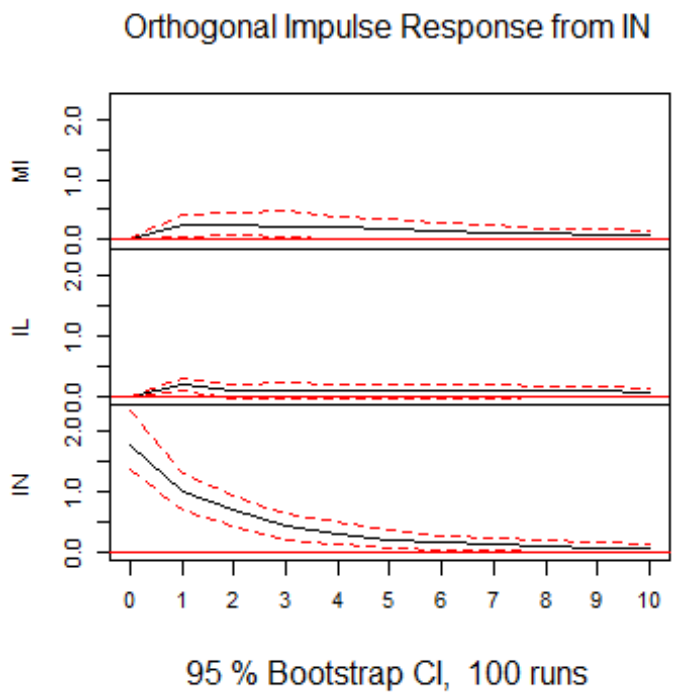
$\widehat{IN} = \underset{(0.084)}{-0.017227} + \underset{(0.04147)}{0.151449}\,MI_{t-1} - \underset{(0.042499)}{0.006117}\,MI_{t-2} + \underset{(0.068886)}{0.273807}\,IL_{t-1} - \underset{(0.067460)}{0.169976}\,IL_{t-2} + \underset{(0.04656)}{0.568094}\,IN_{t-1} + \underset{(0.046965)}{0.013880}\,IN_{t-2}$

1.2) Shock from unemployment rate in Michigan has high effect on unemployment rate in Michigan itself. But, has little impact on Illinois and Indiana as shown by a positive small rise in unemployment rate.



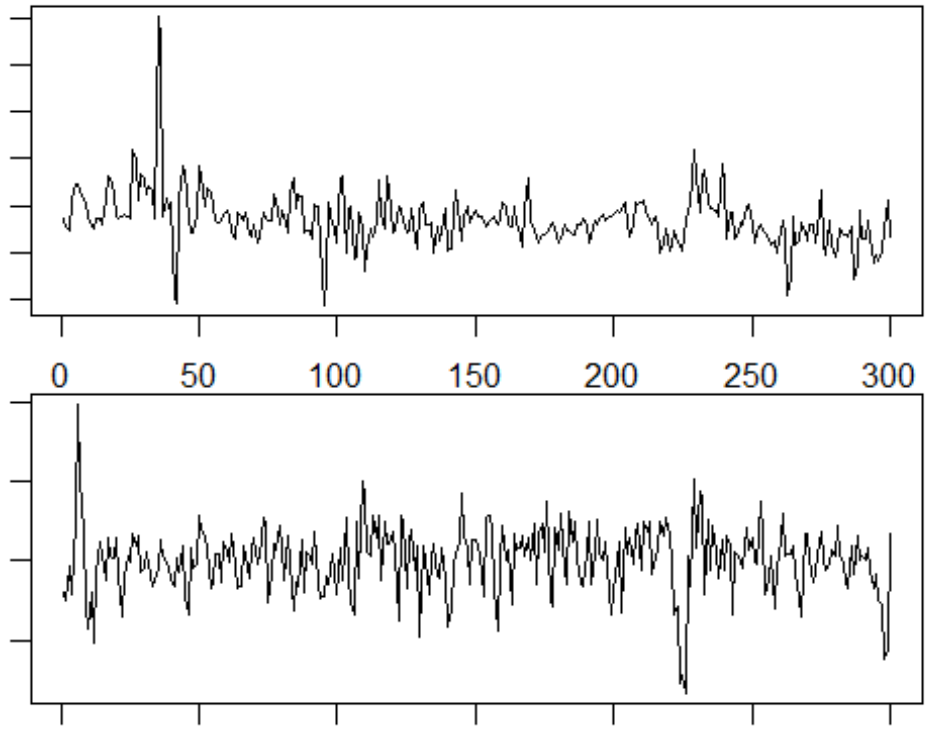


The 1 unit increase in shock on unemployment of Illinois creates very high impact on Illinois itself. But, created small increase in unemployment in Michigan and Indiana. The unemployment rate peak at lag 1 and die down after.



The shock on unemployment rate in Indiana has great impact on itself. But, small positive impact on the other two states.

```
#Answer 1.2

require(MTS)
da1=read.table("m-m1cnwti.txt")
zt1=cbind(da1$V1,da1$V2)
colnames(zt1)=c("M1g","oilg")
dim(da1)

## [1] 300   2

MTSplot(zt1)
```




```
#Answer 2.1

VARorder(zt1)

## selected order: aic =  13
## selected order: bic =  3
## selected order: hq =  3
## Summary table:
##        p     AIC     BIC      HQ     M(p) p-value
##  [1,]  0 -4.6600 -4.6600 -4.6600   0.0000  0.0000
##  [2,]  1 -4.9979 -4.9485 -4.9781 103.3453  0.0000
##  [3,]  2 -5.0163 -4.9175 -4.9768  12.6928  0.0129
##  [4,]  3 -5.1555 -5.0073 -5.0962  46.3600  0.0000
##  [5,]  4 -5.1507 -4.9532 -5.0717   6.0751  0.1936
##  [6,]  5 -5.1371 -4.8902 -5.0383   3.5990  0.4630
##  [7,]  6 -5.1348 -4.8385 -5.0162   6.6570  0.1552
##  [8,]  7 -5.1516 -4.8059 -5.0132  11.7915  0.0190
##  [9,]  8 -5.1278 -4.7327 -4.9696   0.7736  0.9420
## [10,]  9 -5.1665 -4.7220 -4.9886  17.4902  0.0016
## [11,] 10 -5.1692 -4.6753 -4.9715   7.7943  0.0994
## [12,] 11 -5.1484 -4.6051 -4.9310   1.5447  0.8187
## [13,] 12 -5.1491 -4.5565 -4.9119   7.1662  0.1274
## [14,] 13 -5.1824 -4.5404 -4.9255  15.5661  0.0037

m3=VAR(zt1,3)
#Answer 2.2
```

```
require(vars)
varfit1=VAR(zt1,p=3)
summary(varfit1)

##
## VAR Estimation Results:
## =========================
## Endogenous variables: M1g, oilg
## Deterministic variables: const
## Sample size: 297
## Log Likelihood: -75.104
## Roots of the characteristic polynomial:
## 0.7754 0.6964 0.6964 0.4487 0.4487 0.3284
## Call:
## VAR(y = zt1, p = 3)
##
##
## Estimation results for equation M1g:
## ====================================
## M1g = M1g.l1 + oilg.l1 + M1g.l2 + oilg.l2 + M1g.l3 + oilg.l3 + const
##
##         Estimate Std. Error t value Pr(>|t|)
## M1g.l1   0.66841    0.05465  12.230  < 2e-16 ***
## oilg.l1  0.70145    0.70262   0.998    0.319
## M1g.l2  -0.40451    0.06295  -6.426 5.37e-10 ***
## oilg.l2 -1.01842    0.73654  -1.383    0.168
## M1g.l3   0.37999    0.05474   6.942 2.53e-11 ***
## oilg.l3 -0.43989    0.71537  -0.615    0.539
## const    0.49736    0.10308   4.825 2.26e-06 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Residual standard error: 0.9633 on 290 degrees of freedom
## Multiple R-Squared: 0.3901,  Adjusted R-squared: 0.3775
## F-statistic: 30.91 on 6 and 290 DF,  p-value: < 2.2e-16
##
##
## Estimation results for equation oilg:
## =====================================
## oilg = M1g.l1 + oilg.l1 + M1g.l2 + oilg.l2 + M1g.l3 + oilg.l3 + const
##
##          Estimate Std. Error t value Pr(>|t|)
## M1g.l1   0.003467   0.004573   0.758    0.449
## oilg.l1  0.296716   0.058787   5.047 7.93e-07 ***
## M1g.l2   0.007504   0.005267   1.425    0.155
## oilg.l2  0.029814   0.061626   0.484    0.629
## M1g.l3  -0.007121   0.004580  -1.555    0.121
## oilg.l3 -0.057191   0.059854  -0.956    0.340
## const   -0.002715   0.008624  -0.315    0.753
```

$$\widehat{M1g} = \underset{(0.103)}{0.49736} + \underset{(0.055)}{0.66841}\,M1g_{t-1} - \underset{(0.063)}{0.40451}\,M1g_{t-2} + \underset{(0.055)}{0.38}\,M1g_{t-3}$$

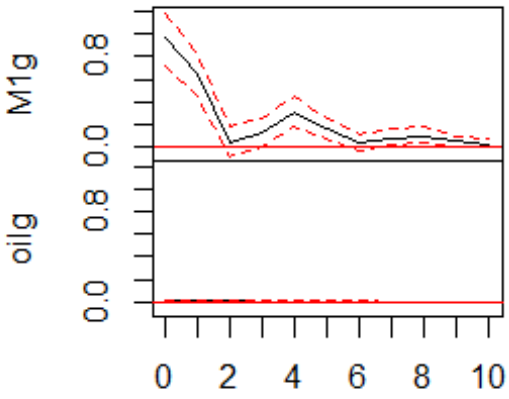
$$\widehat{Oilg} = \underset{(0.1029)}{0.1031} + \underset{(0.703)}{0.70145}\,Oilg_{t-1} - \underset{(0.737)}{1.01842}\,Oilg_{t-2} - \underset{(0.715)}{0.43989}\,oil_{t-3}$$

2.2)

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Residual standard error: 0.0806 on 290 degrees of freedom
## Multiple R-Squared: 0.1153,  Adjusted R-squared: 0.09701
## F-statistic:   6.3 on 6 and 290 DF,  p-value: 3.049e-06
##
##
##
## Covariance matrix of residuals:
##           M1g     oilg
## M1g  0.927944 0.008104
## oilg 0.008104 0.006496
##
## Correlation matrix of residuals:
##         M1g   oilg
## M1g  1.0000 0.1044
## oilg 0.1044 1.0000
```

```
impresp1=irf(varfit1)
plot(impresp1)
```

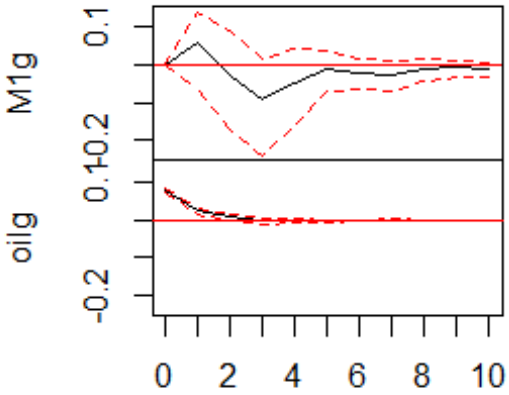
Orthogonal Impulse Response from M1g



95 % Bootstrap CI, 100 runs

2.3) Shock from money supply growth has very high positive impact on itself. The impact decline until lag 2 and increase again until lag 4 when the effect started to die down. However, it has no impact on oil price growth.

Orthogonal Impulse Response from oilg



95 % Bootstrap CI, 100 runs

shock from oil price growth has high impact on itself and the impact die down after 3 months. The shock also has impact on money supply growth. The 95% confidence interval is very broad, one is positive and another is negative. However, the growth increase until lag 1 when it started to decline and turned negative after lag 2, recover in lag 3 but stays negative afterwards.

```
#Answer 2.3

#VARpred(m3,6)
```

have to put "#"
otherwise, unable to compile report.

```r
#Answer 2.4
fevd(varfit1,n.ahead=6)
```

```
## $M1g
##            M1g        oilg
## [1,] 1.0000000 0.000000000
## [2,] 0.9976640 0.002336045
## [3,] 0.9971155 0.002884469
## [4,] 0.9908030 0.009196979
## [5,] 0.9896296 0.010370432
## [6,] 0.9897108 0.010289214
##
## $oilg
##             M1g      oilg
## [1,] 0.01089392 0.9891061
## [2,] 0.01477258 0.9852274
## [3,] 0.03227375 0.9677262
## [4,] 0.03247842 0.9675216
## [5,] 0.03407249 0.9659275
## [6,] 0.03405620 0.9659438
```

```r
#Answer 2.5
```