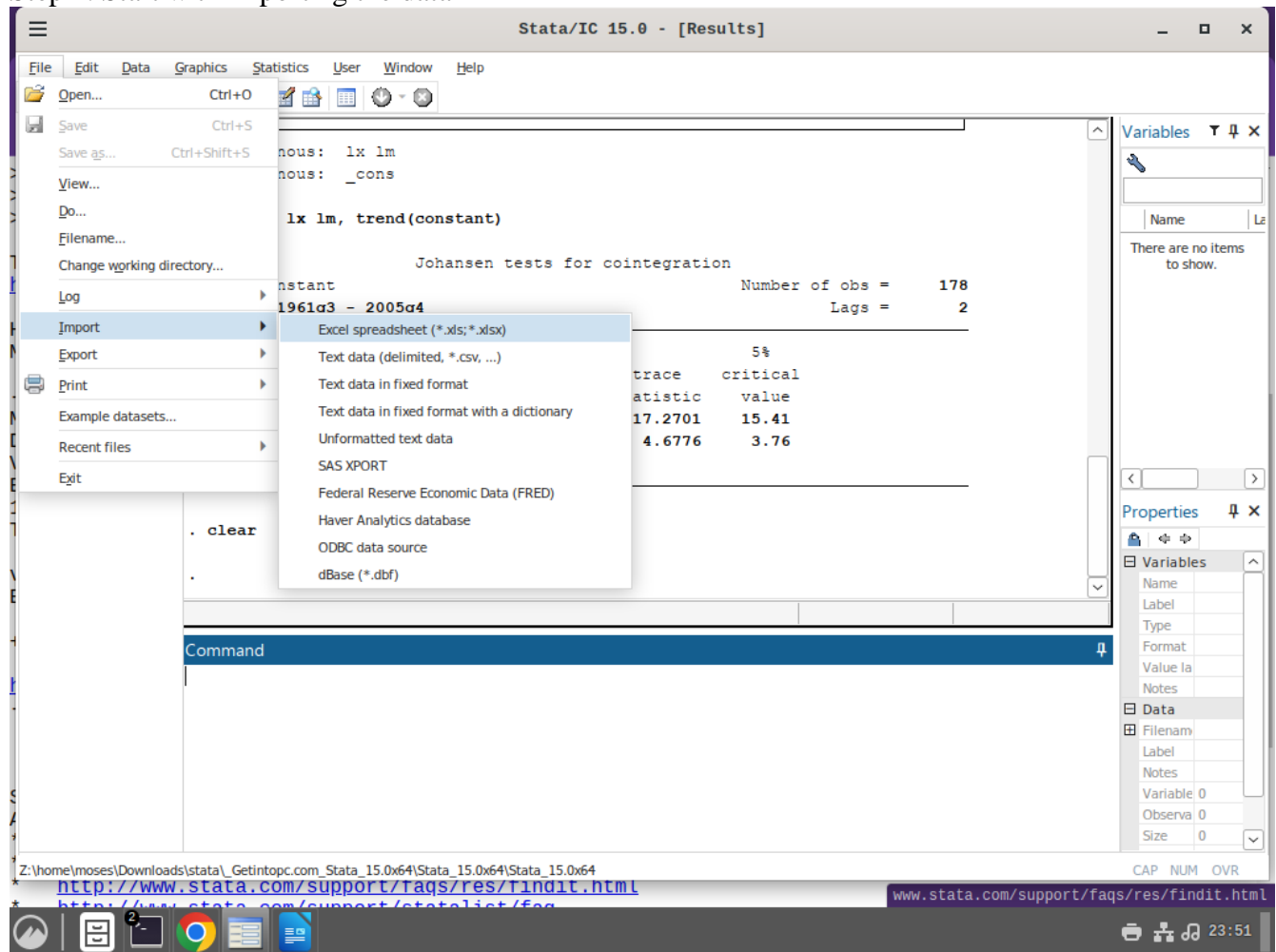


VAR model estimation

Step 1. Start with importing the data



Step2: create a time series variables

Stata/IC 15.0 - [Results]

File Edit Data Graphics Statistics User Window Help

Review

Trend: constant
Sample: 1961q3 - 2005q4
Number of obs = 178
Lags = 2

maximum				5%	
rank	parms	LL	eigenvalue	trace statistic	critical value
0	6	771.05151	.	17.2701	15.41
1	9	777.34778	0.06830	4.6776	3.76
2	10	779.68656	0.02594		

```

. clear
. import excel "Z:\home\moses\Downloads\Cointegration Dataset.xls", sheet("Trade Balance")
> firstrow
. generate quarterly = tq(1961q1)+_n-1
. format %tq quarterly
.

```

Command

Variables

Name	Label	Type	Format	Value label	Notes
Time		tr			
x		x			
m		m			
quarterly					

Properties

Variables

Data

File name

Label

Notes

Variable 4

Observed

Size

3.87K

Z:\home\moses\Downloads\stata_Getintopc.com_Stata_15.0x64\Stata_15.0x64

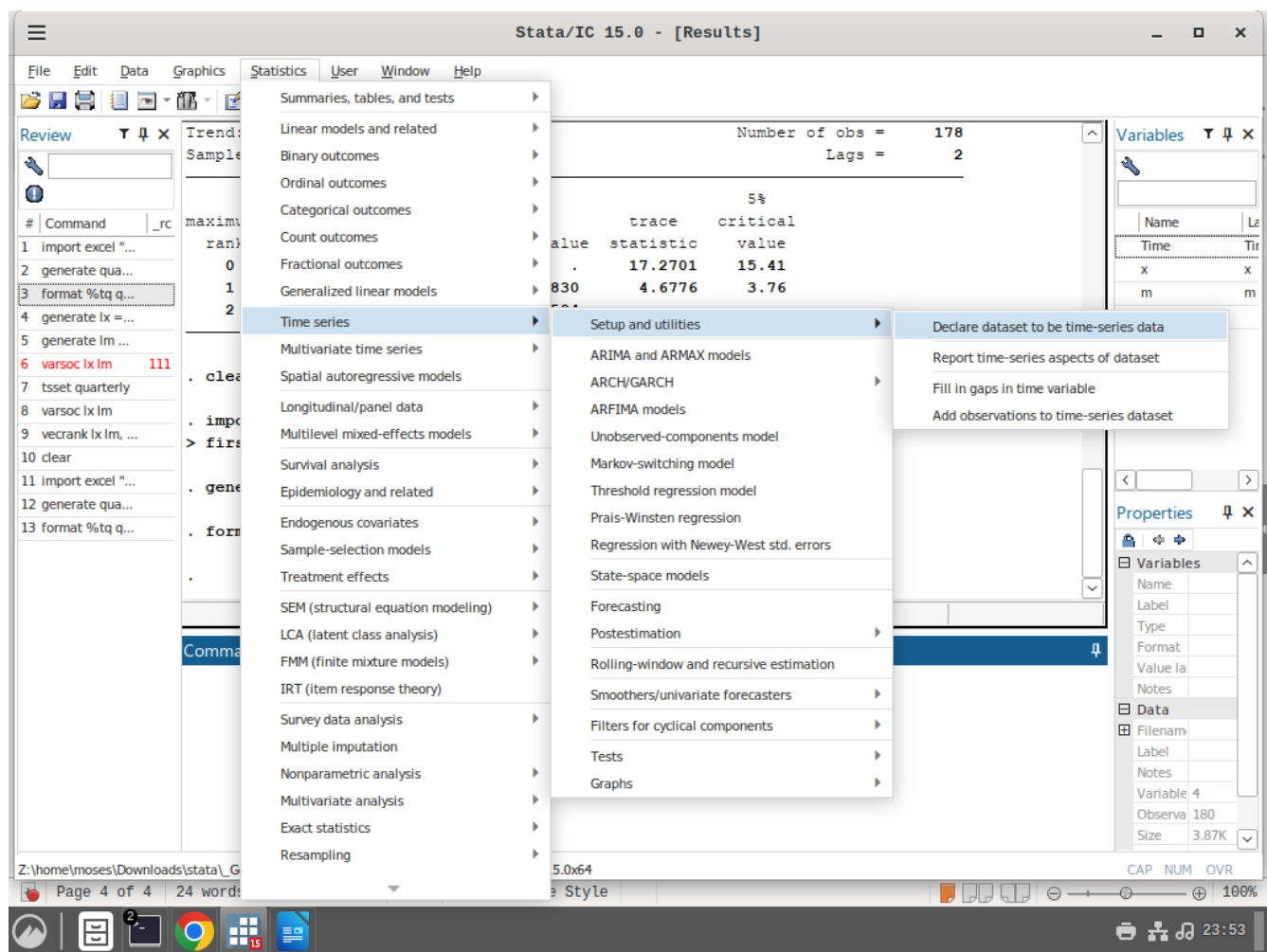
Page 2 of 2 17 words, 99 characters Default Page Style

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100%

23:52

Step 3: set the dataset as time series



Step 4: get the optimal lags

Stata/IC 15.0 - [Results]

File Edit Data Graphics Statistics User Window Help

Review

1 import excel "...
2 generate qua...
3 format %tq q...
4 generate lx =...
5 generate lm ...
6 varsoc lx lm 111
7 tsset quarterly
8 varsoc lx lm
9 vecrank lx lm, ...
10 clear
11 import excel "...
12 generate qua...
13 format %tq q...

Statistics

- Summaries, tables, and tests
- Linear models and related
- Binary outcomes
- Ordinal outcomes
- Categorical outcomes
- Count outcomes
- Fractional outcomes
- Generalized linear models
- Time series
- Multivariate time series
- Spatial autoregressive models
- Longitudinal/panel data
- Multilevel mixed-effects models
- Survival analysis
- Epidemiology and related
- Endogenous covariates
- Sample-selection models
- Treatment effects
- SEM (structural equation modeling)
- Lag-order selection statistics (preestimation)
- Lag-order selection statistics (postestimation)
- Granger causality tests
- LM test for residual autocorrelation
- Test for normally distributed disturbances
- Check stability condition of VAR estimates
- Wald lag-exclusion statistics
- Exact statistics
- Resampling

Number of obs = 178
Lags = 2

	trace	5%	critical
value	statistic		value
830	4.6776		3.76
594			

Balance")

Variables

Name	Label
Time	
x	x
m	m
quarterly	

Properties

Variables

Name	Label	Type	Format	Value label	Notes

Data

Filename	Label	Notes
Variable 4		
Observations	180	
Size	3.87K	

Page 4 of 4 30 words

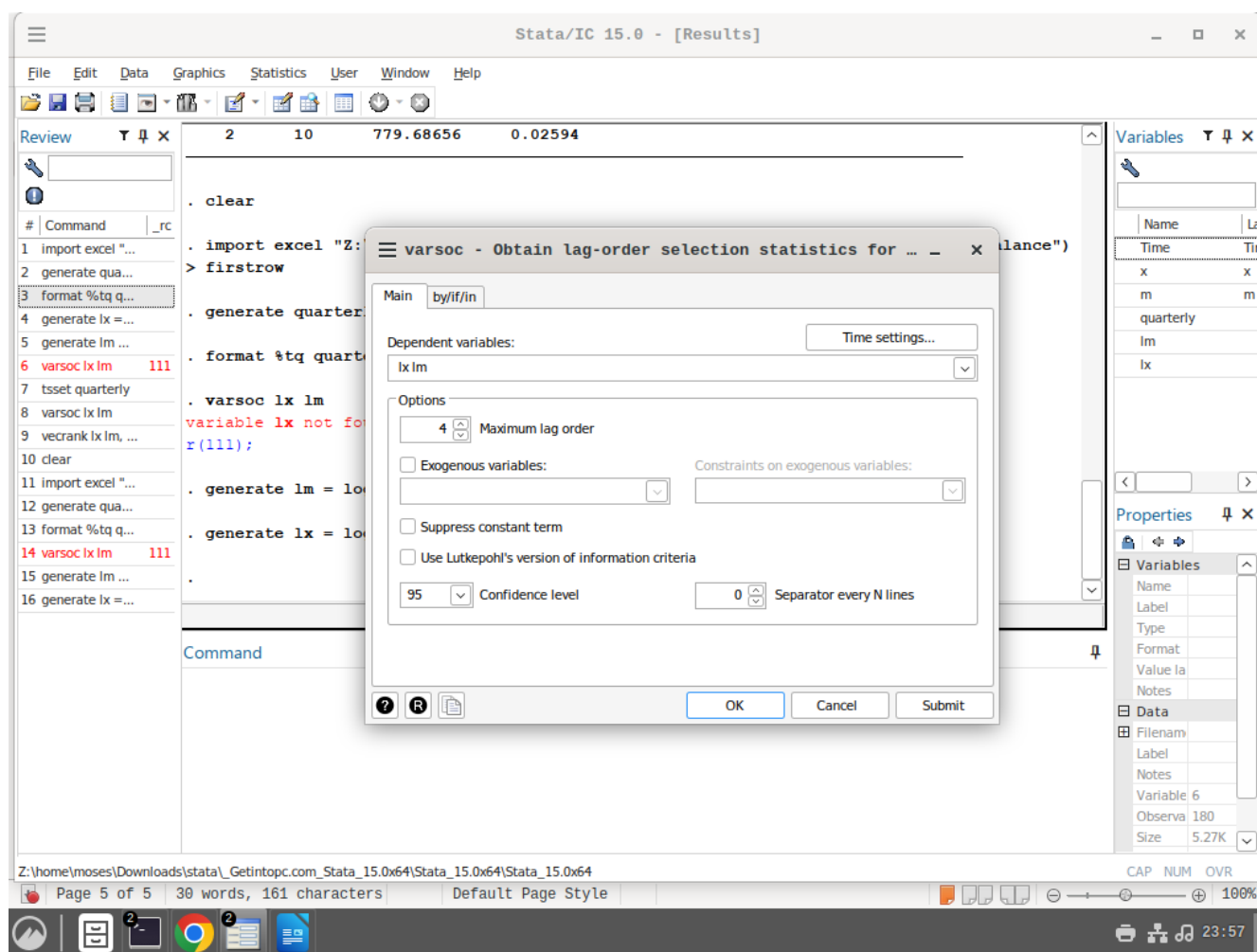
5.0x64

Style

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100%

23:55



step 5: Check for cointegration

Stata/IC 15.0 - [Results]

File Edit Data Graphics Statistics User Window Help

Review

1 import excel "...
2 generate qua...
3 format %tq q...
4 generate lx =...
5 generate lm ...
6 varsoc lx lm 111
7 tsset quarterly
8 varsoc lx lm
9 vecrank lx lm, ...
10 clear
11 import excel "...
12 generate qua...
13 format %tq q...
14 varsoc lx lm 111
15 generate lm ...
16 generate lx =...

Statistics

- Summaries, tables, and tests
- Linear models and related
- Binary outcomes
- Ordinal outcomes
- Categorical outcomes
- Count outcomes
- Fractional outcomes
- Generalized linear models
- Time series
- Multivariate time series**
 - Setup and utilities
 - Vector autoregression (VAR)
 - Basic VAR
 - Structural vector autoregression (SVAR)
 - Vector error-correction model (VECM)
 - Cointegrating rank of a VECM**
 - Dynamic-factor models
 - Multivariate GARCH
 - State-space models
 - Dynamic stochastic general equilibrium (DSGE) models
- Spatial autoregressive models
- Longitudinal/panel data
- Multilevel mixed-effects models
- Survival analysis
- Epidemiology and related
- Endogenous covariates
- Sample-selection models
- Treatment effects
- SEM (structural equation modeling)
- LCA (latent class analysis)
- FMM (finite mixture models)
- IRT (item response theory)
- Survey data analysis
- Multiple imputation
- Nonparametric analysis
- Multivariate analysis
- Exact statistics
- Resampling

ds\Cointegration Dataset.xls", sheet("Trade Balance"))

Variables

Name	Label
Time	Time
x	x
m	m
quarterly	quarterly
lm	lm
lx	lx

Properties

Variables

Name	Label	Type	Format	Value label	Notes
Time	Time	string	%tq		

Data

Filename	Label	Notes	Variable	Observations	Size
Time	Time		6	180	5.27K

Page 6 of 6

Page Style

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23:59

Stata/IC 15.0 - [Results]

File Edit Data Graphics Statistics User Window Help

Review 2 10 779.68656 0.02594

1 import excel "...
2 generate qua...
3 format %tq q...
4 generate lx = ...
5 generate lm ...
6 varsoc lx lm 111
7 tsset quarterly
8 varsoc lx lm
9 vecrank lx lm, ...
10 clear
11 import excel "...
12 generate qua...
13 format %tq q...
14 varsoc lx lm 111
15 generate lm ...
16 generate lx = ...

. clear
. import excel "Z:\home\moses\Downloads\Cointegration Dataset.xls", sheet("Trade Balance")
> firstrow
. generate quarterly
. format %tq quarterly
. varsoc lx lm
variable lx not found
r(111);
. generate lm = log(m...
. generate lx = log(x...
.

Command

vecrank - Estimate the cointegrating rank of a VECM

Model Adv. model by/lf/in Reporting

Dependent variables: lx lm

2 Max

Trend specification: constant

These lags are those obtained from the optimal lag

Variables

Name	Label
Time	
x	x
m	m
quarterly	
lm	
lx	

Properties

Variables

Name	Label	Type	Format	Value label	Notes
lx					

Data

Filename	Label	Notes	Variable	Observations	Size
			6	180	5.27K

OK Cancel Submit

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<http://www.stata.com/support/faq/res/rindit.html>
<http://www.stata.com/support/statalist/faq>

23:59

Stata/IC 15.0 - [Results]

File Edit Data Graphics Statistics User Window Help

Review

Command _rc

- 1 import excel "..."
- 2 generate qua...
- 3 format %tq q...
- 4 generate lx = ...
- 5 generate lm ...
- 6 varsoc lx lm 111
- 7 tsset quarterly
- 8 varsoc lx lm
- 9 vecrank lx lm, ...
- 10 clear
- 11 import excel "..."
- 12 generate qua...
- 13 format %tq q...
- 14 varsoc lx lm 111
- 15 generate lm ...
- 16 generate lx = ...
- 17 vecrank lx lm, ... 111
- 18 tsset quarterly
- 19 vecrank lx lm, ...

```

. tsset quarterly
    time variable: quarterly, 1961q1 to 2005q4
              delta: 1 quarter

. vecrank lx lm, trend(constant)

                Johansen tests for cointegration
Trend: constant      Number of obs =    178
Sample: 1961q3 - 2005q4      Lags =      2

maximum                trace      5%
rank    parms      LL      eigenvalue  statistic  value
-----
0         6      771.05151      .      17.2701    15.41
1         9      777.34778      0.06830      4.6776     3.76
2        10      779.68656      0.02594

```

Command

Variables

Name	Label	Type	Format	Value label	Notes
Time	Time	string			
x	x	float			
m	m	float			
quarterly	quarterly	string			
lm	lm	float			
lx	lx	float			

Properties

Variables

Data

Filename

Label

Notes

Variable 6

Observations

Size

5.27K

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Page 8 of 8 35 words, 192 characters Default Page Style 100%

00:01

For the above we can see for each ranks the trace statistics is greater than the 6% critical values. It means that there is no cointegration

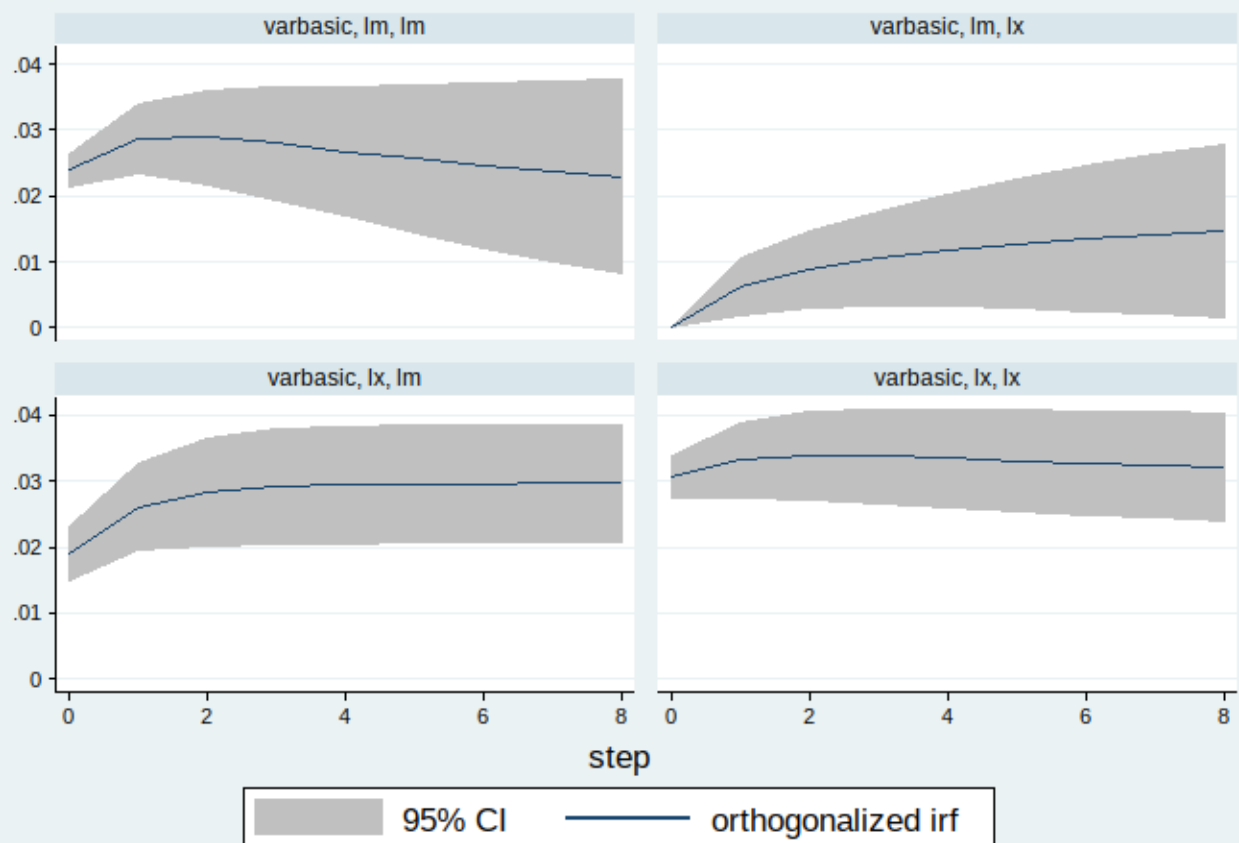
Step 6: fit the basic var model

>

Vector autoregression					
Sample: 1961q3 - 2005q4		Number of	obs =	178	
Log likelihood = 779.6866		AIC	=	-8.648164	
FPE = 6.01e-07		HQIC	=	-8.575675	
Det(Sigma_ml) = 5.38e-07		SBIC	=	-8.469412	
Equation Parms	RMSE	R-sq	chi2	P>chi2	
lx 5	.031146	0.9995	329069.9	0.0000	
lm 5	.030893	0.9994	320549.4	0.0000	
Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
lx					
lx					
L1. .9210061	.0957376	9.62	0.000	.7333639	1.108648
L2. -.0032424	.0941952	-0.03	0.973	.1878616	.1813768

lm					
L1. .2594245	.0938018	2.77	0.006	.0755763	.4432727
L2. -.1792574	.0951692	-1.88	0.060	.3657855	.0072708
_cons .0731122	.0468551	1.56	0.119	.0187221	.1649464
lm					
lx					
L1. .1137655	.0949621	1.20	0.231	.0723568	.2998877
L2. -.0617542	.0934322	-0.66	0.509	.2448779	.1213696
lm					
L1. 1.197059	.093042	12.87	0.000	1.0147	1.379418
L2. -.2535712	.0943983	-2.69	0.007	.4385885	-.068554
_cons .120423	.0464755	2.59	0.010	.0293327	.2115134

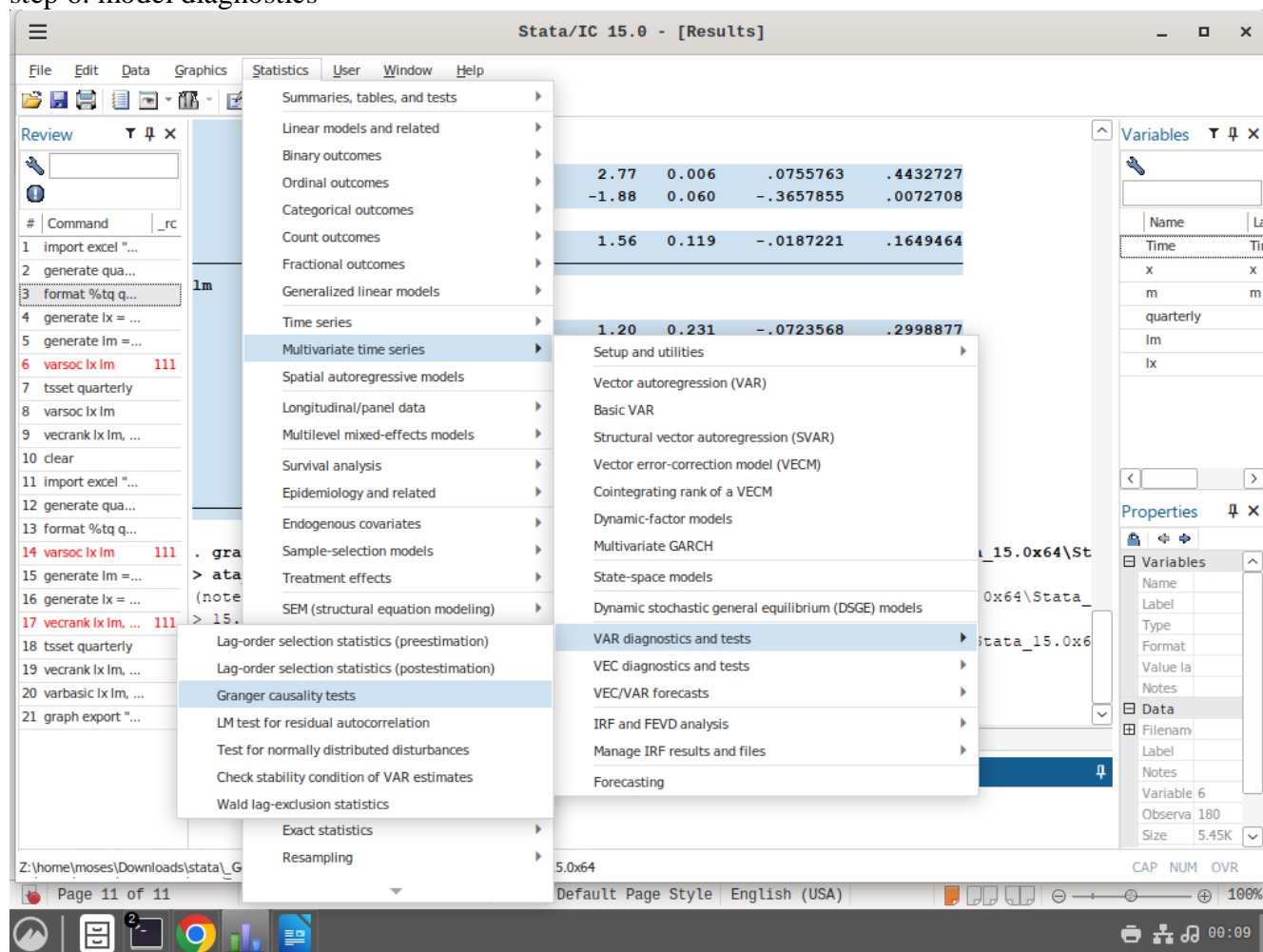
This is the output of the model



Graphs by irfname, impulse variable, and response variable

Above is the IRF graph

step 6: model diagnostics



These are the options for model diagnostics. Lets try the granger causality test.

Stata/IC 15.0 - [Results]

File Edit Data Graphics Statistics User Window Help

Review

	L1.						
L2.	1.197059	.093042	12.87	0.000	1.0147	1.379418	
	-.2535712	.0943983	-2.69	0.007	-.4385885	-.068554	
_cons	.120423	.0464755	2.59	0.010	.0293327	.2115134	

Command _rc

- import excel "..."
- generate qua...
- format %tq q...
- generate lx = ...
- generate lm = ...
- varsoc lx lm 111
- tsset quarterly
- varsoc lx lm
- vecrank lx lm, ...
- clear
- import excel "..."
- generate qua...
- format %tq q...
- varsoc lx lm 111
- generate lm = ...
- generate lx = ...
- vecrank lx lm, ... 111
- tsset quarterly
- vecrank lx lm, ...
- varbasic lx lm, ...
- graph export "..."
- vargranger

. graph export "Z:\home\moses\Downloads\stata_Getintopc.com_Stata_15.0x64\Stata_15.0x64\Stata_15.0x64\irf.png", as(png) replace
(note: file Z:\home\moses\Downloads\stata_Getintopc.com_Stata_15.0x64\Stata_15.0x64\Stata_15.0x64\irf.png not found)
(file Z:\home\moses\Downloads\stata_Getintopc.com_Stata_15.0x64\Stata_15.0x64\Stata_15.0x64\irf.png written in PNG format)

. vargranger

Granger causality Wald tests

Equation	Excluded	chi2	df	Prob > chi2
1x	lm	9.2578	2	0.010
1x	ALL	9.2578	2	0.010
1m	1x	2.293	2	0.318
1m	ALL	2.293	2	0.318

Command

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Page 11 of 11 205 words, 1,164 characters Default Page Style English (USA) 100%

00:10

Exercise:

Please using the same data, redo what has been done in this part.