ECON501 2016

lab07

OUTLINE

1. Basic Stata syntax
2. Review ass1 with Stata
3. Time series in Stata
4. Var and Irf in Stata
5. One question from Greens

WHY LEARN STATA

Stata is developed by econometricians for econometrics.

R is developed by statisticians for anything. .

https://www.youtube.com/user/statacorp

1. BASIC STATA SYNTAX

*** 1. Linear Regression using Stata
http://www.princeton.edu/~otorres/Regression101.pdf

https://www.youtube.com/user/JeffHamrickUSFCA/videos

http://www.ats.ucla.edu/stat/stata/

http://wps.aw.com/wps/media/objects/11422/11696965/tutorials/stata_tutorial_10.pdf

2. REVIEW ASS1 WITH STATA

use https://github.com/davidrpugh/econometrics-labs/raw/master/lab-6/mrw1992.dta

https://github.com/davidrpugh/econometrics-labs/raw/master/lab-1/Lab_1_Intro_to_Stata.pdf

https://github.com/davidrpugh/econometrics-labs/blob/master/lab-2/Lab2_Stata_Do_and_Log_Files.pdf

Read and learn how to interpret results.

3. TIME SERIES IN STATA

*** 1. time-series forecasting in STATA

*www.princeton.edu/~otorres/**TS101.pd***

2. Stata & Time series

https://www.american.edu/ctrl/upload/Stata-Time-series-Fall-2011.pdf

3. http://www.ssc.wisc.edu/~bhansen/460/***stata***.pdf

. generate time=tq(1950q3)+_n-1

. format time %tq

. tsset time

corrgram loggdp

xcorr realgdp unemp, lags(10) xlabel(-10(1)10,grid)

xcorr realgdp unemp, lags(10) table

2. Time Series: Regression & Forecasting

http://www.sergioturner.com/ie/Ch14.pdf

FILTER (CREATES CYCLICAL AND TREND COMPONENTS)

* drop missing data/na

drop if missing(var1)

* filter (creates cyclical and trend components)

tsfilter hp var1_hp = var1 , smooth(100) trend(var1_tr)

http://www.statalist.org/forums/forum/general-stata-discussion/general/4704-tsfilter-on-multiple-variables

4. VAR AND IRF IN STATA

*** 1. *Vector Autoregressions*

http://www.ssc.wisc.edu/~bhansen/390/390Lecture25.pdf

*www.**stata**.com/manuals14/tsvarintro.pdf*

*www.**stata**.com/manuals13/tsvar.pdf*

http://www.stata.com/manuals13/tsirf.pdf

http://www.stata.com/manuals13/tsirfgraph.pdf

Interpretation！ ！ ！ ！ ！ ！ ！

Hansen has a free econometric book.

http://www.ssc.wisc.edu/~bhansen/econometrics/

5. ONE QUESTION FROM GREENS

Applications

1. The data used to fit the expectations augmented Phillips curve in Example 20.3 are given in Appendix Table F5.2. Using these data, reestimate the model given in the example. Carry out a formal test for first-order autocorrelation using the LM statistic. Then, reestimate the model using an AR(1) model for the disturbance process. Because the sample is large, the Prais–Winsten and Cochrane–Orcutt estimators should give essentially the same answer. Do they? After fitting the model, obtain the transformed residuals and examine them for first-order autocorrelation. Does the AR(1) model appear to have adequately "fixed" the problem?
2. Data for fitting an improved Phillips curve model can be obtained from many sources, including the Bureau of Economic Analysis's (BEA) own Web site, www.economagic.com, and so on. Obtain the necessary data and expand the model of Example 20.3. Does adding additional explanatory variables to the model reduce the extreme pattern of the OLS residuals that appears in Figure 20.3?

Example 20.3 Negative Autocorrelation in the Phillips Curve

The Phillips curve [Phillips (1957)] has been one of the most intensively studied relationships in the macroeconomics literature. As originally proposed, the model specifies a negative relationship between wage inflation and unemployment in the United Kingdom over a period of 100 years. Recent research has documented a similar relationship between unemployment and price inflation. It is difficult to justify the model when cast in simple levels; labor market theories of the relationship rely on an uncomfortable proposition that markets persistently fall victim to money illusion, even when the inflation can be anticipated. Current research [e.g., Staiger et al. (1996)] has reformulated a short-run (disequilibrium) "expectations augmented Phillips curve" in terms of unexpected inflation and unemployment that deviates from a long-run equilibrium or "natural rate." The **expectations-augmented Phillips curve** can be written as

$$\Delta p_t - E[\Delta p_t \mid \Psi_{t-1}] = \beta[u_t - u^*] + \varepsilon_t$$

where Δp_t is the rate of inflation in year t, $E[\Delta p_t \mid \Psi_{t-1}]$ is the forecast of Δp_t made in period $t-1$ based on information available at time $t-1$, Ψ_{t-1}, u_t is the unemployment rate and u^* is the natural, or equilibrium rate. (Whether u^* can be treated as an unchanging parameter, as we are about to do, is controversial.) By construction, $[u_t - u^*]$ is disequilibrium, or cyclical unemployment. In this formulation, ε_t would be the supply shock (i.e., the stimulus that produces the disequilibrium situation). To complete the model, we require a model for the expected inflation. For the present, we'll assume that economic agents are rank empiricists.

The forecast of next year's inflation is simply this year's value. This produces the estimating equation

$$\Delta p_t - \Delta p_{t-1} = \beta_1 + \beta_2 u_t + \varepsilon_t$$

where $\beta_2 = \beta$ and $\beta_1 = -\beta u^*$. Note that there is an implied estimate of the natural rate of unemployment embedded in the equation. After estimation, u^* can be estimated by $-b_1/b_2$. The equation was estimated with the 1950.1–2000.4 data in Appendix Table F5.2 that were used in Example 20.1 (minus two quarters for the change in the rate of inflation). Least squares estimates (with standard errors in parentheses) are as follows:

$$\Delta p_t - \Delta p_{t-1} = 0.49189 - 0.090136\, u_t + e_t$$
$$\qquad\qquad (0.7405) \quad (0.1257) \quad R^2 = 0.002561,\ T = 202.$$

The implied estimate of the natural rate of unemployment is 5.46 percent, which is in line with other recent estimates. The estimated asymptotic covariance of b_1 and b_2 is -0.08973. Using the delta method, we obtain a standard error of 2.2062 for this estimate, so a confidence interval for the natural rate is 5.46 percent ± 1.96 (2.21 percent) $=$ (1.13 percent, 9.79 percent) (which seems fairly wide, but, again, whether it is reasonable to treat this as a parameter is at least questionable). The regression of the least squares residuals on their past values gives a slope of -0.4263 with a highly significant t ratio of -6.725. We thus conclude that the residuals (and, apparently, the disturbances) in this model are highly negatively autocorrelated. This is consistent with the striking pattern in Figure 20.3.

HELP PRAIS

prais uses the generalized least-squares method to estimate the parameters in a linear regression model in which the errors are serially correlated. Specifically, the errors are assumed to follow a first-order autoregressive process.

corc specifies that the Cochrane-Orcutt transformation be used to estimate the equation. With this option, the Prais-Winsten transformation of the first observation is not performed, and the first observation is dropped when estimating the transformed equation;

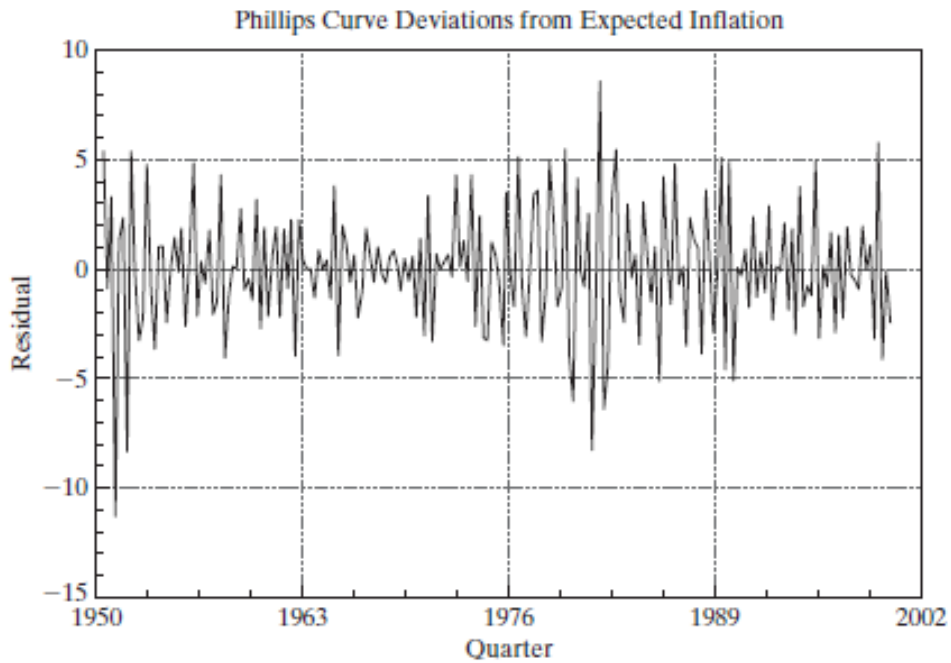

FIGURE 20.3 Negatively Autocorrelated Residuals.

Applications

1. Using the macroeconomic data in Appendix Table F5.2, estimate by least squares the parameters of the model

$$c_t = \beta_0 + \beta_1 y_t + \beta_2 c_{t-1} + \beta_3 c_{t-2} + \varepsilon_t,$$

where c_t is the log of real consumption and y_t is the log of real disposable income.

   a. Use the Breusch and Pagan test to examine the residuals for autocorrelation.
   b. Is the estimated equation stable? What is the characteristic equation for the autoregressive part of this model? What are the roots of the characteristic equation, using your estimated parameters?
   c. What is your implied estimate of the short-run (impact) multiplier for change in y_t on c_t? Compute the estimated long-run multiplier.

https://www.youtube.com/watch?v=iiizhsX-l00

. search freduse

. findit freduse

. help freduse

freduse GS1M CPN3M GS5

varsoc realgdp cpi_u, maxlag(10)