EC443 PS 15 Question 4

Johannes Boehm
(CEP, LSE)

February 26, 2010

LM Test for autocorrelation (Breusch-Godfrey)

H_0: No autocorrelation in error term u
H_1: u is AR(p) process

Question 4: LM Test for Autocorrelation

Steps:

- Perform naive OLS regression

$$LGCAT_t = \beta_1 + \beta_2 LGDPI_t + \beta_3 LGPRCAT_t + u_t$$

Question 4: LM Test for Autocorrelation

Steps:

- Perform naive OLS regression

$$LGCAT_t = \beta_1 + \beta_2 LGDPI_t + \beta_3 LGPRCAT_t + u_t$$

- Save residuals $\hat{u}_t$: genr z = resid

Question 4: LM Test for Autocorrelation

Steps:

- Perform naive OLS regression

$$LGCAT_t = \beta_1 + \beta_2 LGDPI_t + \beta_3 LGPRCAT_t + u_t$$

- Save residuals $\hat{u}_t$: genr z = resid
- Perform auxiliary regression:

$$\hat{u}_t = \delta_1 + \delta_2 LGDPI_t + \delta_3 LGPRCAT_t + \zeta_1 \hat{u}_{t-1} + \cdots + \zeta_p \hat{u}_{t-p} + \varepsilon_t$$

Question 4: LM Test for Autocorrelation

Steps:

- Perform naive OLS regression

$$LGCAT_t = \beta_1 + \beta_2 LGDPI_t + \beta_3 LGPRCAT_t + u_t$$

- Save residuals $\hat{u}_t$: genr z = resid
- Perform auxiliary regression:

$$\hat{u}_t = \delta_1 + \delta_2 LGDPI_t + \delta_3 LGPRCAT_t + \zeta_1 \hat{u}_{t-1} + \cdots + \zeta_p \hat{u}_{t-p} + \varepsilon_t$$

- Test statistic: $U = TR^2$ of this regression. Reject H_0 iff $U > \chi^2_1(0.95)$.

Question 4: LM Test for Autocorrelation

Steps:

- Perform naive OLS regression

$$LGCAT_t = \beta_1 + \beta_2 LGDPI_t + \beta_3 LGPRCAT_t + u_t$$

- Save residuals $\hat{u}_t$: genr z = resid
- Perform auxiliary regression:

$$\hat{u}_t = \delta_1 + \delta_2 LGDPI_t + \delta_3 LGPRCAT_t + \zeta_1 \hat{u}_{t-1} + \cdots + \zeta_p \hat{u}_{t-p} + \varepsilon_t$$

- Test statistic: $U = TR^2$ of this regression. Reject H_0 iff $U > \chi^2_1(0.95)$.
- For $p = 1$ this is asymptotically equivalent to Durbin h-test.