Ramsey Regression Equation Specification Error Test
RESET

Ann Hardin

11 December 2018

ECON 5350

RESET Test

- Tests explanatory variables for a non-linear relationship with the response variable
- Do the X's have a non-linear relationship with Y?
- Quadratic, Cubic, 4th Power, etc.?
- Natural Log?

RESET Test

- General test for model misspecification
- Uses degrees of freedom
- Tells you if there is an error in the form of your regression
- Does not distinguish between
  - Heteroskedasticity
  - Omitted Variables
  - Measurement error

Steps to perform RESET Test

- Consider

$$Y = X\beta + \epsilon$$

- Solve for $\hat{Y}^2$, which is $(X\hat{\beta})^2$
- Solve for as many $\hat{Y}^{\#}$ as needed
- The new regression is

$$Y = X\beta + \delta_1 \hat{Y}^2 + ... + \delta_{k-1} \hat{Y}^k + \epsilon$$

Significance

- Test significance of the δ's
- Run an F-test
  - If δ is significant implies:
    - a polynomial relationship
    - unless $\delta = 0$ then you have the correct form
  - If δ is not significant implies you have the correct form

MATLAB Example

- Consider the wage example where
- $$lnwage = [constant, age, age^2, grade, married, union]\beta + \epsilon$$
- 1st: Run with actual data
  - *age* vs age^2
- 2nd: Run with simulated data
  - wage vs lnwage
  - *age* vs age^2