Financial Econometrics

May 30th 2017

Exercise 1 (3/10) Consider y the sovereign rating of a country A and three macroeconomic factors x_1, x_2 and x_3 (e.g., *growth*, *external balance* and *external debt*). You have observed a sample of quarterly data over 20 years and estimated a model of the rating following Cantor and Packer (1996):

$$y_t = \beta_0 + \beta_1 x_{1t} + \beta_2 x_{2t} + \beta_3 x_{3t} + \varepsilon_t$$

obtaining estimates $\hat{\beta}$ for the unknown parameters.

The history of your sample, nevertheless, comprehends a large traumatic event (e.g., a regional currency crisis) affecting the area of Country A, which begun in the 54th quarter.

- How would you test for parameter stability in the estimated model? (*multiple answers are possible*)

Exercise 2 (3/10) With respect to the model in Exercise 1, suppose the model is stable as regards the parameters; you nevertheless suspect the event to have affected the error variance.

1. How would you test for homoskedasticity in the case at hand?
2. What would the consequences be if you rejected homoskedasticity?
3. Do you know any strategies to be followed if homoskedasticity is rejected?

Exercise 3 (4/10) Consider the linear model

$$y = \beta X + \varepsilon$$

1. Derive the Ordinary Least Squares estimator $\hat{\beta}_{OLS}$
2. Show that $\hat{\beta}_{OLS}$ is unbiased, highlighting which properties does this result depend upon