

Financial Econometrics

June 30th 2016

Exercise 1 (4/10) Consider a stock A and the market portfolio M. You have observed a sample of 47 data points and estimated a CAPM model of the excess returns r_A :

$$r_A = \alpha + \beta r_M + \varepsilon$$

resulting in $\hat{\alpha} = 0.4$, $\hat{\beta} = 1.5$ with standard errors, respectively, 0.6 and 0.2.

1. What is your best point forecast for the return on stock A next year if the market grows by 5 (*percent*) and the risk-free rate is 2 (*percent*)?
2. Suppose that after 28 periods there was an important stockmarket crash. Discuss how you would proceed to test for stability in the above model.

Exercise 2 (3/10) With respect to the model in Exercise 1,

1. You are given the table of critical values for the t distribution. Construct the 95% confidence interval for α and β .
2. Comment on the results in the light of the CAPM theory, with particular respect to the proposition: “A is a defensive stock”.

Exercise 3 (3/10) Consider the linear model

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

1. Write down the Ordinary Least Squares estimator $\hat{\beta}_{OLS}$ in matrix form
2. Describe the estimator for the variance $Var(\hat{\beta}_{OLS})$
3. Show that $\hat{\beta}_{OLS}$ is unbiased, highlighting which properties does this result depend upon