

Problem Set II

1. This problem uses the nareit STATA dataset. The variables are nareit (NAREIT index), nasdaq, sp500, and bond10 (the yield on the 10 year bond). The data is monthly.
 - a. Create the monthly return for the three indices and also returns lagged one month.
 - b. Regress the monthly return on the NAREIT index as a function of its own lagged return and the lagged monthly returns from the NSADAQ and SP500 index.
 - c. Create a one month ahead prediction for the return on the NAREIT along with the standard error of the forecast.
 - d. Interpret the results of a Breusch-Pagan and White test for heteroksedasticity on this model.
 - e. The 1990-95 period caused several changes in the real estate industry caused by the Savings and Loan crisis. Drop the 1990-1995 period and test to see if the variance in the disturbance term changed before and after this period.

2. Given the following model:

$$Y_i = \beta_{1i}X_{i1} + \beta_{2i}X_{i2} + \varepsilon_i$$

Where all terms are scalars and ε follows ideal conditions. The coefficients are specified as follows:

$$\beta_{ji} = \beta_j + \mu_{ji} \text{ for } j=1,2 \text{ where the } \mu\text{'s have mean zero and variance } \sigma_j^2.$$

- a. Substitute out for the β_{ji} 's in the main equation.
- b. Show that OLS estimates of the β 's are unbiased.
- c. Derive the N x N covariance matrix of the composite disturbance term.
- d. Discuss what you would consider an appropriate test of the null hypothesis that σ_j^2 's are equal to zero.