Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ECO 141

Spring 2016

**Homework 6**

1. The Efficient Market Hypothesis (EMH) has received a lot of attention in the literature in both Finance and Economics. The EMH states that current asset prices incorporate all available information which renders future returns unforecastable. In other words, nobody can systematically “beat the market”. Investor can only obtain higher returns through riskier securities, not through picking under-/over-valued assets. Since efficient markets ensure that new information gets instantly reflected in asset prices, changes in prices tomorrow are independent of changes in prices today and will only reflect tomorrow’s news. You will attempt to test EMH by running current returns on their past values as modeled by AR(1) process.

**Table 1. Regression Results**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Method** | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** |
| Dependent variable: |  |  |  |  |  |
|  | ( ) | ( ) | ( ) | ( ) | ( ) |
|  | \_\_\_\_\_\_\_\_ | ( ) | \_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_ | ( ) |
| *intercept* |  |  |  |  |  |
| *R2* |  |  |  |  |  |
| *RSS* |  |  |  |  |  |
| *n* |  |  |  |  |  |
| F statistic |  |  |  |  |  |
| Standard errors | regular | Regular | Robust | regular | regular |

1. Interpret the coefficient in regression (1). Is it statistically significant? What do you conclude about predicting your stock returns based on past stock returns?
2. Suppose you try a different specification by running regression (2). Do you get the same results? Test the efficient market hypothesis.
3. Is non-linear specification necessary? Perform a RESET test with squared terms only. Write down the steps.
4. Run regression (3) with robust errors and compare the results. Comment.
5. Plot returns against time. Comment.
6. Perform the Breush-Pagan test for heteroskedasticity by running regression (4). Write and explain every step.
7. Interpret the slope from regression (4).
8. Would your results change in light of the results from part (d)?
9. Compute fitted values,  ,from regressions (4) and (5). Are there any negative fitted values in either regression? What does it mean?
10. Use the from regression (5) to estimate regression (1) by weighted least squares Compare your OLS estimate of the slope with WLS. Does it change your conclusion on EMH?
11. Does your regression model (1) suffer from autocorrelation? Can you test for it by using Durbin-Watson test? Comment.
12. Consider an estimatorof the linear regression model**.** Where is a positive definite, symmetric matrix of constants, which can be decomposed as . Then and **.** All usual MLR assumptions hold except for homoskedasticity.
13. Is unbiased? State the assumptions used.
14. Find Var(State the assumptions used.
15. Is it consistent?
16. Suppose the linear regression model has error terms that follow AR(1) process. , where is a white noise process with *E*( that satisfies all usual MLR assumptions.
17. Find *E*(), stating clearly any assumptions used.
18. Find *Var*(, stating clearly any assumptions used.
19. Find *Cov*( stating clearly any assumptions used.