UCLA **Fall 2016**
MGMT 239C **Prof. Mikhail Chernov**

Empirical Asset Pricing
Problem Set 3
due 12 hours before the class

Problems

1. We observe scalar data $p_1, ..., p_T$, which are drawn from a data-generating process

$$p_t = \alpha + \beta p_{t-1} + \varepsilon_t, \qquad \varepsilon_t \sim N\left(0, \sigma^2\right).$$

The ε's are i.i.d. You can think of the data as log stock prices. Use Monte Carlo simulation to answer the following questions.

   (a) If the true model is $\alpha = 0$, $\beta = 1$, $\sigma = 0.2$,
      i. What is the bias in OLS estimates of these parameters for a sample of size 50? (Here I mean there are 51 data points and thus 50 observations for the regression.)
      ii. Does the answer to the above question depend on either the true values for α or σ?
      iii. What are the 0.01 and 0.05 percentile values of the lower tail of the distribution of the t-statistic for testing $\beta = 1$?
      iv. Now, answer the previous question (iii.) with a sample size of 600.

   (b) If the true model is $\alpha = 0$, $\beta = 0.95$, $\sigma = 0.2$,
      i. What is the bias in the OLS estimates of these parameters for a sample size of 50?