Assignment No. 3

1. Please write brief but complete answers.
    a. What is a competitive market? Briefly describe the types of markets other than perfectly competitive markets.
    b. What is the demand curve? Why does it slope downward?
    c. Define the equilibrium of a market. Describe the forces that move a market toward its equilibrium.
    d. Describe the role of prices in market economies.

2. During the 1990s, technological advance reduced the cost of computer chips. How do you think this affected the market for computers? For computer software? For typewriters?

3. STATA exercise: To do this exercise you should have read the paper by Romer and Romer published in the AER.

    a. Download the data file inflation.dta.
    b. Plot both inflation series against time, i.e. do two plots: in the first one graph expected inflation against time and in the second one plot actual inflation against time.
    c. Test the hypothesis that the survey data for inflation expectations is rational. In order to do this, follow the steps below:
        i. Run the following regression using simple OLS:
        $$\pi_t = \alpha + \beta \pi^e_t + \varepsilon_t$$
        where π_t stands for actual inflation and π^e_t stands for the survey expected inflation.
        ii. Test the hypothesis that a=0 (where a is the estimate for the intercept).
        iii. Test the hypothesis that b=1, where b is the estimate for β.
        iv. Notice that if you reject the hypothesis above, you can conclude (in a rough sense) that the survey is not rational. What do you conclude from your tests above?

4. STATA exercise: To do this exercise you should read the article by Cumby and Mishkin in JIMF.
    a. Download the data set Int.dta.
    b. Find the ex post real interest rate series for the US. In other words, find: $eprr^{US} = i^{US} - \pi^{US}$ where i^{US} stands for the nominal interest rate in the US, π^{US} stands for inflation rate in the US and $eprr^{US}$ for ex post real interest rate in the US. Once you have the series plot it, together with the inflation series, in a graph against time.
    c. Find the ex post real interest rate series for Germany. In other words, find: $eprr^{G} = i^{G} - \pi^{G}$ where i^{G} stands for the nominal interest rate, π^{G} stands for inflation rate, $eprr^{G}$ for ex post real interest rate. Once you get the series plot it together with the German inflation series in a graph against time.
    d. Regress the US ex post interest rate ($eprr^{US}$) on:
        i. the US nominal interest rate (i_t^{US})
        ii. a time trend (t)

iii. the three lagged inflation variables: USinfl_1, Usinfl_2, Usinfl_3.

In other words, run the following regression using OLS:

$$eprr_t^{US} = \alpha + \beta i_t^{US} + \delta t + \varphi_1 \pi_{t-1}^{US} + \varphi_2 \pi_{t-2}^{US} + \varphi_3 \pi_{t-3}^{US} + \varepsilon_t$$

Show the estimates and standard errors for each of the coefficients.

e. Find the fitted values from the previous regression (part 4) and call the predicted values 'prrUS'.

f. Regress German ex post real interest rates ($eprr^G$) on prrUS and a constant, i.e. run the following regression:

$$eprr^G = \nu + \gamma\, prrUS + \varepsilon$$

g. Test the null hypothesis that $\nu = 0$ (from regression estimates in part f).

h. Test the null hypothesis that $\gamma = 1$ (from regression estimates in part f).

i. Notice that testing for $\nu = 0$ and $\gamma = 1$ is equivalent to test for the equalization of real rates in the US and Germany. Would you conclude, from your results above, that they are equalized?