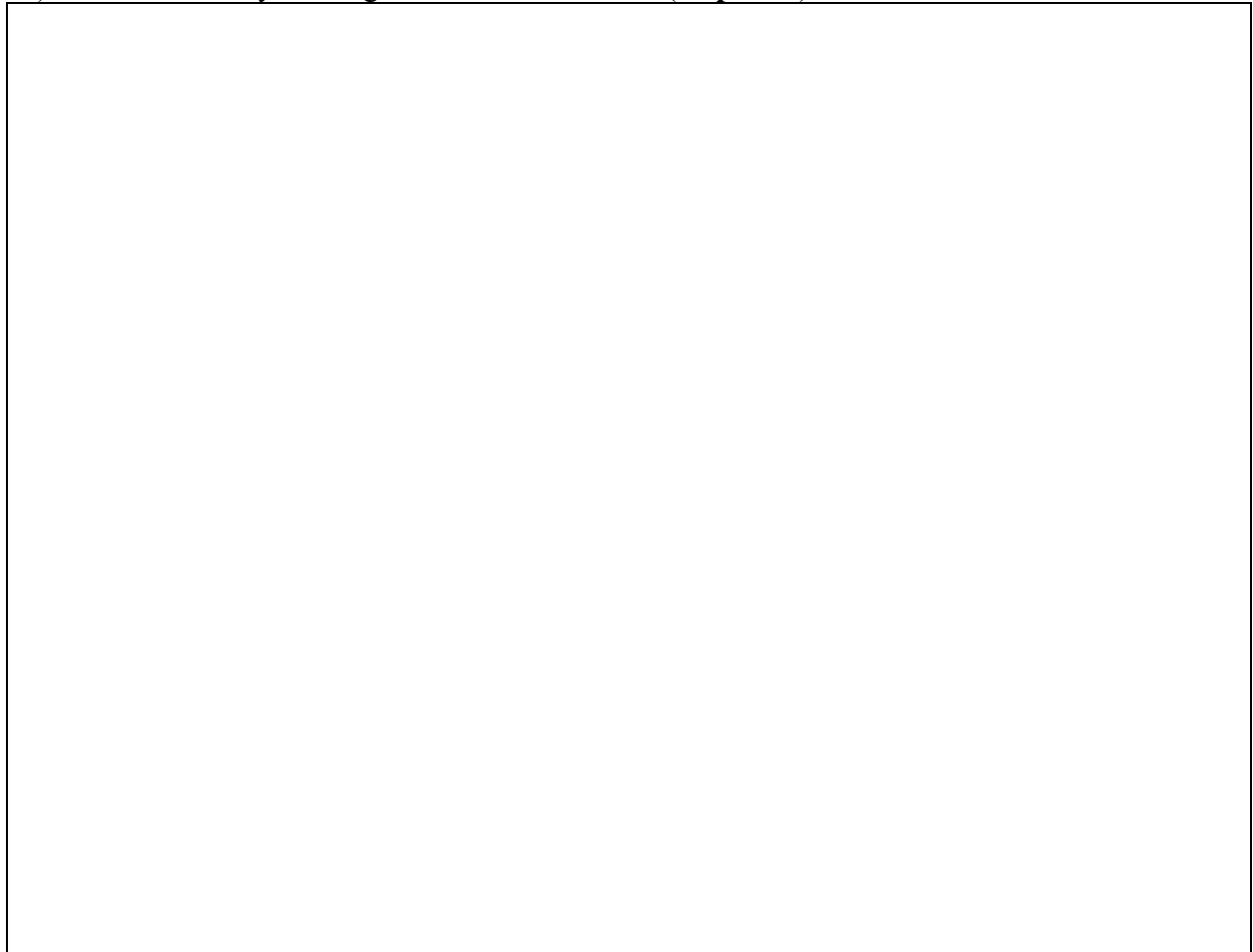**Question 2.**

Research the following sources for the data (years 1981-2009) that are needed to answer this question: Inflation (CPI-U) and unemployment rates (Bureau of Labor Statistics), as well as expected annual inflation rates based on Livingston Survey, Federal Reserve Bank of Philadelphia.

2a) Based on these data, clearly draw and properly label (via Excel, for instance) a diagram, where the difference between the actual inflation rate for each year and the rate of expected inflation at the end of the previous year is plotted on the vertical axis (in percentage points). Plot the rate of unemployment (percent) on the horizontal axis. Then, in the diagram, clearly point out (and properly label) what and where the natural rate of unemployment is (what the NAIRU is equal to). Later on, use some results from part 2b) to add additional details to your diagram (see question 2b). You can insert your diagram in the box below. (**25 points**)

2b) Let actual inflation be $\hat{p}_t$, and expected inflation be $\hat{p}^e_{t,t-1}$. (That is, agents at the end of the previous period, $t-1$, form an expectation of what price inflation will be during the present period, t.) Then, based on the data collected, estimate the following regression line: $\hat{p}_t - \hat{p}^e_{t,t-1} = a + bU_t + error_t$ (U_t is unemployment rate) by finding a and b. Draw the fitted regression line (insert in the diagram above), which is essentially the Phillips curve equation. What is R^2 equal to? [Use maximum two sentences in your explanation] (**25 points**)

2c) Once you have estimated a and b, plug them into the estimated regression expression $(\hat{p}_t - \hat{p}^e_{t,t-1} = a + bU_t)$, factor out b from the right-hand-side, and sense what the natural rate of unemployment must be based on this modified equation. This natural rate must equal to what you have indicated in the diagram, so make sure you confirm it. [No excessive verbal explanation is needed here, but show your work below] (**10 points**)

THE END