

1) (18 points) Use the data in the tab “Q1” of the [Excel file](#) to forecast quantity as a function of the different prices, and income. Check for multi-collinearity of the independent variables. Is it acceptable to leave all four variables in? Why or why not? **If it is not acceptable**, re-run the regression without one variable and tell me why you left that variable out. **If it is acceptable**, then tell me how many pumpkin pies you would expect to sell to a person with an income of \$50,000 if you charged \$10/pie, \$12/cake, and \$2/doughnuts. Given the results, are pies and cakes substitutes, likely substitutes, likely unrelated, likely complements, or complements? Explain your logic.

The answers are typed on the Excel file I handed back with your Excel files.

2) (22 points) Use the data in the sheet “Q2” on the [Excel file](#) to run a regression to predict sales as a function of income and price. Do the quick checks for heteroscedasticity and autocorrelation. Explain how you know whether or not you had each problem. **If there is only a problem with autocorrelation**, then run a regression which would adjust for that problem. Explain what you did and why. **If both problems exist or there is only a problem with heteroscedasticity**, then do the formal test for heteroscedasticity and explain what you did. Use the F-distribution function in Excel to determine whether or not you have heteroscedasticity.

The answers are typed on the Excel file I handed back with your Excel files.

3) (12 points) Answer EITHER Part A OR Part B.

A) Some economists feel the SRPC is useless because it moves too much. Explain their logic. Every time the expected inflation changes, the SRPC will move because it crosses the LRPC at the expected level of inflation. Therefore, if the government wants to push the unemployment rate below the natural rate, people will see this and predict higher inflation than they used to predict. Therefore, the curve moves. So, it is not useful to make policy around.

B) Explain the hysteresis model of the natural rate of unemployment.

The hysteresis theory is that the history will determine the future. If the unemployment rate goes up and stays up for an extended period of time, then there are more unemployed people losing their skills. This will cause them to be structurally unemployed. That will increase the natural rate of unemployment. If the unemployment rate goes down, then the companies will be forced to hire people without skills and train them. This will decrease the number of structurally unemployed, so the natural rate of unemployment also decreases.

4) (14 points) Answer EITHER Part A OR Part B.

A) What can the government do to move the LRPC left? State two actions they could take and explain how one of them would result in the LRPC moving left.

The government needs to decrease frictional unemployment and/or structural unemployment. Structural unemployment is easier to decrease. Improving education systems, including trade schools, and making them more affordable would give the people the skills they lack. Frictional unemployment is harder to decrease. If you decrease the unemployment benefits and/or the length of time you get benefits, then people will have more of an incentive to take the first offer rather than waiting for the best job. So, they will be frictionally unemployed for less time.

B) What are tax-based income policies (TIP)? How might they reduce inflation? Why might they make the inflation worse?

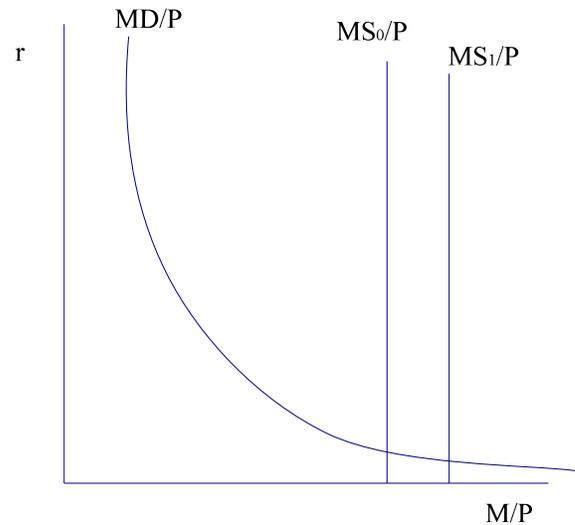
TIP is where the government sets an inflation target lower than the current rate. So, if the inflation rate is 7%, they may choose 5%. If a company increases wages and prices more than 5%, then they are taxed. That gives them incentive to increase wages and prices less than 5%. However, it could backfire. If the

government set the target at 2%, then many firms will decide that avoiding the tax would hurt them too much, so they will not meet the target. Since they are taxed more, that causes the costs of production to increase faster. Therefore, their prices will increase faster.

5) (16 points) Answer EITHER Part A OR Part B.

A) Draw an appropriate diagram to illustrate a Keynesian liquidity trap. Explain how it means that monetary policy will be ineffective.

When the real interest is very low, it cannot go much lower. Therefore, the real money demand is nearly horizontal. So, increasing the money supply will have almost no effect upon the interest rate. That means there is almost no change in investment or AD. So, GDP does not change and monetary policy is ineffective. Think about Japan, according to TradingEconomics.com, the current inflation rate is +.4% and the current 5 year government bond nominal interest rate is -.08%. So the real return is approximately $-\frac{1}{2}\%$.



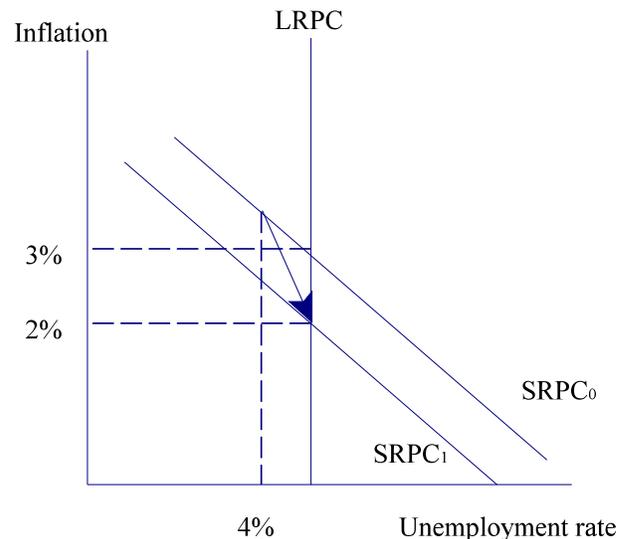
B) Explain why firms may want to have a fixed markup. How would that cause price rigidity?

Firms want to set $MR = MC$. We know from microeconomics that $MR = P[1+1/E]$ where E is the elasticity of demand. So, if the elasticity of demand is constant the ratio of MR to P is fixed, so the ratio of MC to P is fixed, i.e., a fixed markup. Also, it makes decision making easy. Every product is increased by the same percent of your costs. If your wages and materials have year long, or longer contracts, then your costs do not change during that time, so our prices are not likely to change.

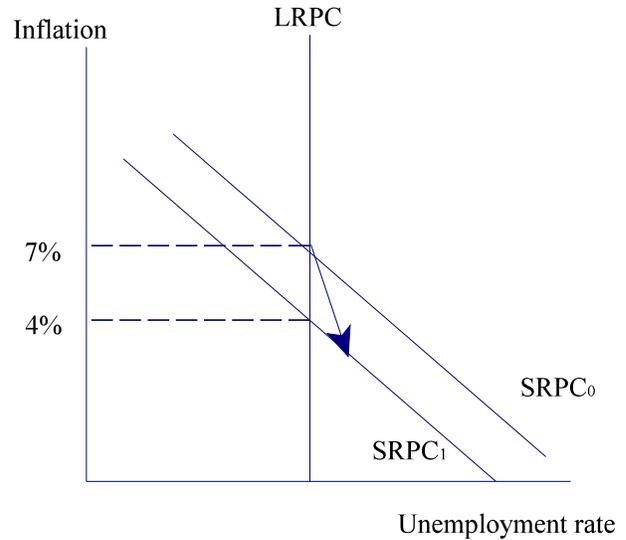
6) (18 points) Answer EITHER Part A OR Part B.

A) Draw the Augmented SRPC/LRPC diagram. Have the graph show the unemployment rate as 4% and the expected inflation of 3%. Given your graph, how much inflation is in the economy at the start? Explain how you reached that conclusion. Suppose the Fed decides to increase the money supply 2% and people believe that. Illustrate the effects of that on the graph. Explain why the curve(s) moved as drawn and how you found the new point. Given your graph, what are the inflation rate and unemployment rate at the end of the movement? How did you reach the conclusion?

Since the expected inflation rate is 3%, that is where the two curves initially cross. However we start with an unemployment rate which is less than full employment rate, so we start to the left of the LRPC with an inflation rate greater than 3%. When the expectations change to 2%, people change their behavior (not requiring as big a pay increase) so that the SRPC will be lower. Since they predicted correctly, wages are correct and we end up at full employment. That puts us where the new SRPC crosses the LRPC. So, our new unemployment rate is 5% and the inflation rate is 2%.



B) Draw the Augmented SRPC/LRPC diagram. Have the graph show the unemployment rate as 5% and the expected inflation of 7%. Given your graph, how much inflation is in the economy at the start? Explain how you reached that conclusion. Suppose the Fed decides to increase the money supply 1% and people change their belief to the money supply will increase 4%. Illustrate the effects of that on the graph. Explain why the curve(s) moved as drawn and how you found the new point. Given your graph, what are the inflation rate and unemployment rate at the end of the movement? How did you reach the conclusion?



The initial situation has the curves cross at 7% because that is the expected inflation. We start at that point because the unemployment rate is 5%, which is on the LRPC. When people lower their expectation to 4%, that means they will not ask for as much of a wage increase and the SRPC will decrease to show that. However, even though they did not ask for as much of a raise as before, they asked for too much. This is because $4% > 1%$. So, the SRAS has moved too far up/left. This reduces GDP and increases unemployment. So, we end up where the arrow is pointing at a higher unemployment rate and an inflation rate between 1% and 4%.