Exercise session #6 - Aggregate Supply

Problem 1 - Sticky wage model
Consider the following changes in the sticky wage model (first describe the model).

- Suppose that labor contracts specify that the nominal wage be fully indexed for inflation. That is, the nominal wage is to be adjusted to fully compensate for changes in the consumer price index. How does full indexation alter the aggregate supply curve in this model?

- Suppose now that indexation is only partial. That is, for every increase in the CPI, the nominal wage rises, but by a smaller percentage. How does partial indexation alter the aggregate supply curve in this model?

Problem 2 - Sticky price model
In the sticky-price model, describe the aggregate supply curve in the following special cases. How do these cases compare to the Keynessian short-run aggregate supply curve?

- No firms have flexible prices (s = 1).

- The desired price does not depend on aggregate output (a = 0).

Problem 3 - Understanding Phillips curve
Suppose that an economy has the Phillips curve

$$\pi = \pi_{-1} - 0.5(u - 0.06)$$

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- What is the natural rate of unemployment?

- Graph the short-run and long-run relationships between inflation and unemployment.

- How much cyclical unemployment is necessary to reduce inflation by 5 percentage points? Using Okun's law, compute the sacrifice ratio.

- Inflation is running at 10 percent. The Fed wants to reduce it to 5 percent. Give two scenarios that will achieve that goal.

Problem 4 - Implication of rational expectations

Assume that people have rational expectations and that the economy is described by the sticky-wage or sticky-price model. Explain why each of the following propositions is true:

- Only unanticipated changes in the money supply affect real GDP. Changes in the money supply that were anticipated when wages and prices were set do not have any real effects.

- If the Fed chooses the money supply at the same time as people are setting wages and prices, so that everyone has the same information about the state of the economy, then monetary policy cannot be used systematically to stabilize output. Hence, a policy of keeping the money supply constant will have the same real effects as a policy of adjusting the money supply in response to the state of the economy. (This is called the policy irrelevance proposition.)

- If the Fed sets the money supply well after people have set wages and prices, so the Fed has collected more information about the state of the economy, then monetary policy can be used systematically to stabilize output.

Problem 5 - Hysteresis

Suppose that an economy has the Phillips curve

$$\pi = \pi_{-1} - 0.5(u - un)$$

, and that the natural rate of unemployment is given by an average of the past two years' unemployment:

$$u_n = 0.5(u_{-1} + u_{-2})$$

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- Why might the natural rate of unemployment depend on recent unemployment (as is assumed in the preceding equation)?

- Suppose that the Fed follows a policy to reduce permanently the inflation rate by 1 percentage point.What effect will that policy have on the unemployment rate over time?

- What is the sacrifice ratio in this economy? Explain.

- What do these equations imply about the short-run and long-run tradeoffs between inflation and unemployment?