14.02 Principles of Macroeconomics

Problem Set 4

Fall 2017

Question 1 (Chapter 7)

Using the information in Chapter 7 or the slides from Lecture 7, label each of the following statements as True, False, or Uncertain and briefly explain (max 1 paragraph each).

(a)

Since 1950, the participation rate in the US has remained roughly constant at 60%.

(b)

Each month, the flows into and out of employment are very small (less than 1%) compared to the size of the labor force.

(c)

Fewer than 10% of all unemployed workers exit the unemployment pool each year, either to become employed or to exit the labor force.

(d)

The unemployment rate tends to be high in recessions and low in expansions.

(e)

Most workers are typically paid their reservation wage.

(f)

Workers who do not belong to unions have no bargaining power.

(g)

It may be in the best interest of employers to pay workers above their reservation wage.

(h)

The natural rate of unemployment is invariant to any policy interventions.

Question 2 (Chapter 8)

Suppose the Phillips Curve is given by:

$$\pi_t - \pi_t^e = .1 - 2u_t$$

where:

$$\pi_t^e = \pi_{t-1}$$

Suppose that inflation in year $t - 1$ is zero. In year t, the Central Bank decides to keep the unemployment rate at 4% forever.

[Hint: here the initial assumption is that wages are not indexed. This explains why we assume $\pi_t^e = \pi_{t-1}$. In (c) below we ask what happens when we relax this assumption.]

(a)

Compute the inflation rates for years t, $t + 1$, $t + 2$, and $t + 3$.

(b)

Now suppose that half of the workers have indexed labor contracts. Nominal wages in those contracts move one-for-one with variations in the actual price level. What is the new equation for the Phillips Curve?

(c)

Based on your answer to subpoint (b), compute the inflation rates for years t, $t + 1$, $t + 2$, and $t + 3$.

(d)

Discuss briefly the impact of wage indexation on the relation between π and u and compare your answers to (a) and (c) above.

Question 3 (Chapter 8)

For this question, refer to the data in Table 1.

Table 1 The Nominal Interest Rate, Inflation, and the Real Interest Rate, 1929–2033

Year	Unemployment Rate (%)	Output Growth Rate (%)	One-Year Nominal Interest Rate (%), i	Inflation Rate (%), π	One-Year Real Interest Rate (%), r
1929	3.2	−9.8	5.3	0.0	5.3
1930	8.7	−7.6	4.4	−2.5	6.9
1931	15.9	−14.7	3.1	−9.2	12.3
1932	23.6	−1.8	4.0	−10.8	14.8
1933	24.9	9.1	2.6	−5.2	7.8

Assume there is a constant Phillips Curve

$$\pi_t - \pi_t^e = -\alpha \left(u_t - u_n \right)$$

throughout the period.

(a)

If inflation expectations are always equal to zero, what would the natural rate of unemployment be using data from 1929?

(b)

Is setting $\pi_t^e = 0$ for all years between 1929 and 1933 consistent with the data we observe? In other words, does it seem like a plausible assumption?

(c)

Assume $\pi_{1929}^e = 0$ and $\pi_{1930}^e = -1\%$. What is u_n? What is the value of α?

(d)

Using the Phillips Curve you derived in (c) above, find the levels of expected inflation in 1931, 1932, 1933.[1] What does this lead you to conclude about the assumption that the natural rate of unemployment remained constant throughout the Great Depression?

(e)

If the expected level of inflation had remained anchored at the actual value of inflation in 1929, would the Great Depression have been more or less severe? Using the same Phillips Curve you derived in c, write down the unemployment rates for all the years from 1929 to 1933 for the case in which inflation expectations were always equal to π_{1929}.

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[1]For the sake of this question, let's pretend inflation can be lower than -100%.