Problem sets 5: Medium-term adjustment and inflation dynamic

EE312: Intermediate macroeconomics

Semester 2/2018

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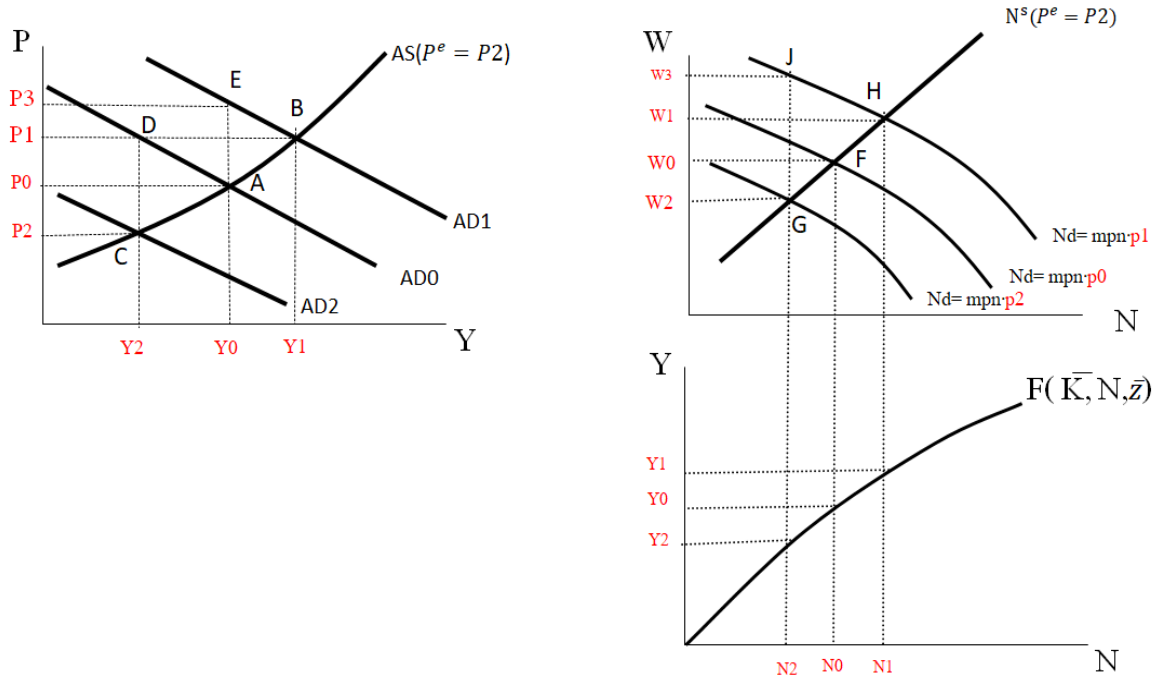
Due on April 2th ,2019 at the BE office. (before 3 pm)

1) The diagram below illustrates three key figures discussed in class. Suppose the current level of **aggregate demand is equal to AD2**. Answer the following questions.



a) Explain the intuition behind the notation of expectation-based labor supply and aggregate supply.

b) From the figure, indicate the point(s) that represent(s) the natural level of output and natural level of employment. Explain the underlying reason.

c) If the government uses an expansionary fiscal policy, **causing a shift of aggregate demand curve to AD0**, discuss what happen to the equilibrium in the short-run. Compare the value of real wage before and after the policy. Use the figures and indicate the points that represent the new short-run equilibrium. For now, consider the case when the policy is unanticipated.

d) Does the equilibrium point indicated in "c" represent a sustained equilibrium? Why? Discuss about what happen, if any, after the medium-run adjustment. Use the figure and

indicate the points that represent the equilibrium after the medium-run adjustment (Hint: if the point(s) is not provided in the figure, add one(s) and complete the figure on your own.)

e) If the expansionary policy is instead anticipated, discuss what happen to the equilibrium in the short-run. Does your answer differ from the previous case when the policy is unanticipated?

2. (*Evolutionary inflation dynamic* and Gaining trust) Suppose that the Phillips curve takes the following form,

$$\pi_t = \pi_t^e - 0.7(u_t - u_t^n) + \vartheta_t$$

where π_t = inflation

π_t^e = expected inflation

u_t = actual unemployment rate

u_t^n = the natural rate of unemployment

ϑ_t = other supply shocks that directly affect the inflation rate

Assume that the inflation expectation is given by,

$$\pi_t^e = (1-\theta)\bar{\pi} + \theta\pi_{t-1}$$

where $\bar{\pi}$ is the level of targeted inflation, set and publically announced by the central bank. In words, we assume that people form the expectation using the weighted average between past observed inflation and the targeted inflation rate. The value of theta (θ) could be between 0 and 1.

Suppose that (i) θ is now equal to zero, (ii) the rate of unemployment initially stays at the natural rate of unemployment, assumed to be equal to 5%, (iii) ϑ_t is set equal to zero where there is no random shocks, and the inflation target ($\bar{\pi}$) is set to be 2%. *In year t, the government decides to bring the unemployment rate down to 3%, and hold it there forever.* Answer the following question

2.1) Determine the rate of inflation in period t, t+1, t+2, t+3, t+4, t+5.How does the value of inflation in each period compare with the targeted inflation ($\bar{\pi}$)?

2.2) Do you believe the answer given in 2.1? Why or why not? (Hint: Think about how people are more likely to form the expectations of inflation.)

Now suppose in year t+6, θ increases from 0 to 1. Suppose that the government still determines to keep unemployment rate at 3%

2.3) Why might theta (θ) increase this way?

2.4) What might be the rate of inflation in period t+6, t+7, t+8, and t+9?

2.5) From (2.4), what can we conclude about inflation when $\theta = 1$ and unemployment rate is kept at 3%?

Now suppose in year t+10, a new government is elected. The government reforms the authority under control. It determines to keep unemployment rate at 5% and brings the inflation down to the targeted level ($\bar{\pi}$).

2.6) What happen to inflation in period t+10 if the government instead keeps the unemployment rate at 5%. Would this allow central bank to be successful in achieving the targeted inflation in period t+10?

2.7) To bring down the inflation to the targeted level, what does government need to do in period t+11? What will happen to the unemployment rate?

2.8) Given the result in (2.7) and its full commitment to keep unemployment rate at 5%, what happen to inflation in period t+12, t+13, t+14, t+15?

Now suppose in year t+16, the value of theta reduces from 1 to 0.

2.9) Why might theta (θ) reduce this way? What can we imply about the value of theta (θ) and the past macroeconomic outcomes?

Now suppose that, in year t+17, Oil price suddenly increases, causing the random supply shocks to be equal to 1%*. Assume the supply shock occurs temporarily, and takes the value of 1% only in period t+17. In the period afterwards, the shocks disappear, with the value of ϑ_t set to remain zero.*

2.10) With the supply shock and the policy to keep unemployment rate at its natural level, what is the inflation in period t+17? Supplement your analysis using the diagram that we discussed in class.

2.11) What happen to the inflation in period t+18 and t+19?

2.12) Redo (2.10) and (2.11) with the alternative assumption that the value of theta (θ) sets equal to 1. What would happen to the inflation in period t+17 and t+18? Would the inflation in period t+18 be equal to the targeted level?

2.13) Following from the analysis in (2.12), what would be the required policy plan in year t+19 if the government wants to keep the inflation equal to *the targeted level ($\bar{\pi}$)*?

2.14) Based on the analysis given so far, do you think what could possibly determine the volatility of rate of inflation and the rate of unemployment under the presence of supply shocks? How does the credible commitment on inflation target play role in the determination of macroeconomic stability outcomes?