Business Cycles
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Summer 2022

Problem Set

The Effect of Shocks in the New Keynesian Model

1. The equations characterizing the demand side in the New Keynesian (and Neoclassical for that matter) are

$$\begin{aligned} C_t &= C^d(Y_t - G_t, Y_{t+1} - G_{t+1}, r_t) \\ I_t &= I^d(r_t, A_{t+1}, K_t) \\ Y_t &= C_t + I_t + G_t \\ M_t &= P_t M^d(r_t + \pi^e_{t+1}, Y_t) \end{aligned}$$

a) Which equations summarize the IS curve?

b) Under our standard assumptions, how are consumption and investment affected by changes in the interest rate?

c) Suppose consumption and investment are very sensitive to changes in the interest rate. How will this affect the slope of the IS curve? What is the economic intuition? Derive the AD curve in this case.

d) Now suppose neither consumption nor investment are affected by changes to the interest rate. Show how will this affect the slope of the IS curve and explain the economic intuition. Derive the AD curve in this case and discuss how the slope is different than in part b.

2. Graphically analyze the effects of an increase in θ_t in the Neoclassical and sticky price model. When possible, compare the magnitudes of the changes of each endogenous variable.

3. Suppose that agents come to expect a higher inflation rate which in the model is represented by an increase in the exogenous variable π^e_{t+1}.

a) Graphically show how this affects the endogenous variables of the in the Neoclassical model. Discuss how consumption, investment, the real wage, and the labor input change.

b) Graphically show how this affects the endogenous variables of the in the sticky-price model. Discuss how consumption, investment, the real wage, and the labor input change.

4. Consider the basic sticky price New Keynesian model as presented in class. Suppose that the economy is driven into a recession caused by an exogenous reduction in A_t.

a) Graphically show the effects of the reduction in A_t on the endogenous variables of the model. Include in your graph what happens to the flexible price, neoclassical values of the endogenous variables.

b) What pressure will there be on the position of the AS curve as the economy transitions from short run to medium run?

c) An observer looking at data generated from this model will observe a particular correlation between inflation and output conditional on a shock to A_t. Is that correlation consistent with the idea of the Phillips Curve as presented in class? What is missing from looking at a simple correlation between inflation and output when comparing it to the predictions of the Phillips Curve?

5. Use the graphical tools introduced in class to analyze the effects of an exogenous increase in the price level P in the short run run. Explain what is meant by "stagflation" and why it is especially challenging for policymaking.