

**Instructions**

1. These questions are intended to be a useful focus for your final exam preparation. Some of them will appear on the final exam either in exactly the form shown here or in variation, alongside other question not in this pool.
2. You may collaborate with your fellow students in investigating these questions. However, because you must write your own answer on exam day it is crucial that you understand the logic of any answer that the group comes up with. Moreover, group answers are sometimes wrong!
3. In addition to these reviewing these questions, please read the following papers on European unemployment:

**Siebert, Horst**, "[Labor Market Rigidities: At the Root of Unemployment in Europe](#)," *Journal of Economic Perspectives* 11:3, Summer 1997, 37-54.

**Nickell, Stephen**, "[Unemployment and Labor Market Rigidities: Europe versus North America](#)," *Journal of Economic Perspectives* 11:3, Summer 1997, 55-74.

There will be one or more questions on the final exam pertaining to these papers.

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1. Are prices sticky and, if so, are menu costs the explanation?
2. Are per-capita income levels converging absolutely or conditionally?
3. TFU: An increase in the cost of detecting whether workers are shirking on the job is likely to raise real wages but also to cause a higher equilibrium unemployment rate. (Diagram suggested)
4. TFU: In an open-economy model with perfect capital mobility and floating exchange rates, expansionary fiscal policy increases aggregate demand after adjustments in international transactions are considered. (Diagram suggested)
5. Explain briefly why reducing money growth to zero ends inflation immediately in the Taylor overlapping price contract model but not in the Mankiw-Reis sticky information model.
6. TFU: The  $q$  theory of investment predicts that a decrease in the real interest rate will depress the prices of shares on the stock market. (Diagram suggested)
7. Explain the intuition behind the following equation from the matching model of unemployment:  
$$rV_F = (A - w - C) - b(V_F - V_V).$$

8. TFU: According to the Lucas imperfect information model, an increase in the average rate of money growth should not affect the slope of the short-run aggregate-supply curve, but an increase in the variance of money growth should make the curve steeper (less elastic).

9. In the theory of coordination failures, what is the difference between positive spillovers (externalities) and strategic complementarity? Which affects the Pareto optimality of equilibrium and why? Which leads to “multipliers” and sometimes to multiple equilibria and why? (Diagram suggested.)

10. TFU: Growth models with constant returns to scale in produced factors can explain why levels of per-capita income in two countries would not converge, even if the countries had identical behavioral parameters.

11. The *NSC* curve (with *NL* on the horizontal axis) in the Shapiro-Stiglitz model is given by

$$w = \bar{e} + \left( \rho + \frac{b\bar{L}}{\bar{L} - NL} \right) \frac{\bar{e}}{q}.$$

Assuming that the wage is high enough to prevent shirking, firms' profits are given by

$$\Pi = F(\bar{e}L) - wL.$$

- Derive the equation for the firm's profit-maximizing level of employment in a form with the wage alone on the left-hand side. Draw a curve representing this equation (assuming that all *N* firms are identical) on a graph with the *NSC* curve, showing the equilibrium level of unemployment.
- Suppose that there is an increase in the rate at which shirkers are fired (*q*)? Show graphically and explain in words/equations how this would affect the equilibrium wage and levels of employment and unemployment?
- Suppose that the firm can choose how much to monitor workers. The cost of monitoring enough to achieve a given level of *q* is *M(q)*. Explain what sign you'd expect for *M'(q)*. Modify the profit function to account for monitoring costs and derive an expression describing the firm's optimal choice of *q*. (You probably won't be able to solve the equation for *q*.)

12. In the search and matching model of unemployment, the value to the firm of having a vacant job is given by

$$V_v = \frac{1}{r} \left[ -C + \frac{\alpha A}{a + \alpha + 2b + 2r} \right],$$

where  $a$  is the rate at which unemployed workers find jobs and  $\alpha$  is the rate at which vacant jobs are filled. In equilibrium,

$$a = \frac{bE}{\bar{L} - E} \quad \text{and} \quad \alpha = K^{1/\gamma} (bE)^{\gamma-1/\gamma} (\bar{L} - E)^{\beta/\gamma}.$$

Vacancies are assumed to be costless to create.

- a. Draw a graph showing the relationship between  $V_v$  and  $E$ .
- b. Use your graph to show and words and/or equations to explain how unemployment would be affected by an increase in labor productivity  $A$ .
- c. Based on this result, how would you expect unemployment to vary over the business cycle if a labor market incorporating search were added to the real-business-cycle model? Explain.

13. TFU: Under customary assumptions about money demand, a growing economy will have zero inflation if the rate of monetary growth is zero.

14. TFU: In an open-economy model with perfect capital mobility and floating exchange rates, expansionary fiscal policy increases aggregate demand after adjustments in international transactions are considered.

15. TFU: In the Lucas imperfect-information model, the appointment of a new central-bank chairman is likely to change how individuals respond to changes in prices.

16. In the Ramsey growth model,  $\dot{c} = 0$  when  $f'(k) = \rho + \theta g$ , and  $\dot{k} = 0$  when  $c = f(k) - (n + g)k$ . Show graphically and briefly explain the effects on consumption per effective labor unit, capital per effective labor unit, and output per effective labor unit of a decrease in the rate of time preference both immediately and in the steady state.

17. Explain the intuition of the following equations, where  $N$  refers to a developed Northern country and  $S$  to a less-developed Southern one, explaining what each variable and coefficient means:

$$\begin{aligned} \dot{A}_N(t) &= B a_{LN} L_N A_N(t), \\ \dot{A}_S(t) &= \mu a_{LS} L_S (A_N(t) - A_S(t)). \end{aligned}$$

18. Briefly describe the steady-state behavior of the wage rate, interest rate, and the shares of income going to labor and capital in the Solow growth model.

19. How long a recession (if any) would result from an unanticipated monetary contraction in each of the following models: (a) real-business-cycle model, (b) Lucas's imperfect-information model, (c)

Fischer's predetermined-price model, (d) Taylor's fixed-price model, (e) Mankiw and Reis's sticky-information model.

20. TFU: If workers in Spain tend to be lazier than those in Germany, then the Shapiro-Stiglitz model predicts that Spain will (*ceteris paribus*) have a higher real wage *and* a higher equilibrium rate of unemployment than Germany.

21. TFU: Only nominal price rigidities can lead to monetary non-neutrality; only real rigidities can lead to coordination failures through strategic complementarity and multiple equilibria.

22. TFU: In the absence of adjustment costs,  $q$  would always be equal to one.

23. Briefly explain why the ability of the economy to use factors of production to produce non-rival innovations can lead to positive "scale effects" in endogenous growth models: an economic with a larger population will grow faster.

24. Does the real business cycle model predict that real wages should be procyclical or countercyclical? How about employment? What does the empirical evidence say about the direction and magnitudes of the fluctuations in these variables in comparison with the model's predictions?