

Professor Christiano
C-11, Fall 1997

Final Exam

IMPORTANT: read the following notes

- You may not use calculators, notes, or aids of any kind.
- Note the points each question is worth and plan your time accordingly. The total number of points possible is 100, and the number of points per question is indicated in parentheses.
- Explain your answers carefully in clear English. We are particularly interested in whether you understand the underlying economic intuition. Supplement what you say with liberal use of diagrams.
- Write neatly and label all diagrams. We cannot give you credit if we cannot read your answer.
- Write your name and TA section (whether Thursday or Friday) on each blue book.

1. (20) By comparison with the 1960s, the decade of the 1970s was a time of persistently high unemployment and persistently rising prices. Explain how the adverse oil shock that occurred early in the decade could account for the unemployment observation, but has a harder time accounting for the price observation. (Hint: explain what an oil shock does to the natural rate of unemployment and to the price level. Use the AS-AD framework to explain what happens in the short and medium run after an oil shock.)
2. (15) It is said that a change in the saving rate cannot change the growth rate of the economy in the long run, but that it can nevertheless change the growth rate for a while. Explain.
3. (15) Many used to believe in the following proposition, ‘The principle of diminishing marginal productivity of capital implies that eventually the day must come when growth in output per person comes to a stop.’ Explain why someone might believe this proposition. Explain why the continual arrival of new ideas can indefinitely put off the day when per capita output growth must stop.
4. (20) Suppose you observe an economy in which recessions are always preceded by a sudden, sharp increase in the rate of interest. As the recession proceeds, output and the interest rate both fall. What two shocks could be the underlying cause of recessions in this economy? Explain. What additional data would you need to see to determine which of the two is the one that is actually at work? Explain.
5. (30) Suppose the production function is given by $Y = K^\alpha(LA)^{1-\alpha}$, $\alpha = \frac{1}{3}$, $\frac{K}{Y} = 3$. The rate of depreciation on capital is δ , so that if K is the capital stock at the beginning of the year, the wear and tear on it during the year is δK . Suppose that $\delta = 0.04$. The economy is known to be in a long-run equilibrium, and the growth rate of output is 0.03, i.e., 3%.
 - (a) Suppose there is perfect competition in this economy. What is the share of income going to the owners of capital? What role does the assumption of perfect competition play in your argument?

- (b) The Golden Rule ratio, $k = K/(LA)$, is that value of k that maximizes, in long-run equilibrium, $c = C/(LA)$. Derive a simple expression that can be used to test whether this economy is at the Golden Rule value of k . Show that it is in fact below the Golden Rule.
- (c) What policies could be adopted to move the economy toward the Golden Rule? What are the considerations in favor and against implementing this policy?