

Professor Christiano
Economics 311, Winter 2005

First Midterm

IMPORTANT: read the following notes

- You may not use calculators, notes, or aids of any kind.
- A total of 82 points is possible, with the distribution by question indicated in parentheses.
- Explain your answers carefully in clear English.
- Write neatly and label all diagrams. We cannot give you credit if we cannot read your answer.
- Write your name here:

CIRCLE your TA

- Helge - 9:00 Fri (101 Annenberg)
- Helge - 3:00 Fri (32 Annenberg)
- Jon - 9:00 Fri (32G Annenberg)
- Jon - 3:00 Fri (203 Harris)
- Nenad - 9:00 Fri (203 Harris)
- Nenad - 3:00 Fri (308 Harris)

Scores:

Q1:	
Q2:	
Q3:	
Q4:	
Total:	

Following are some equations relevant to this exam:

$$\begin{aligned}
 C^d &= c_0 + c_1(Y - T), \\
 G^d &= \bar{G} \\
 T &= \bar{T} + t_1 Y, \quad 0 \leq t_1 < 1 \\
 I^d &= \bar{I} - b \times i + q \times Y \\
 M^d &= P \times Y \times (\bar{L} - L_1 \times i), \quad L_1, \bar{L} > 0
 \end{aligned}$$

The ‘Keynesian Cross Model’ corresponds to $t_1 = b = q = 0$. The ‘Standard IS-LM Model’ corresponds to $b > 0, t_1 = q = 0$. The ‘IS-LM model with an investment accelerator’ effect corresponds to $b, q > 0, t_1 = 0$. The 30 exogenous variables are $c_0, c_1, \bar{G}, \bar{T}, t_1, \bar{I}, b, q, \bar{L}, L_1$. The ‘Keynesian Cross diagram’ is the diagram with Y and Z on the vertical axis and Y on the horizontal, used to analysis the Keynesian Cross model.

1. (22) Shorter questions.
 - (a) (2) Explain the concept of ‘internal rate of return’. What role does it play in helping to explain why investment falls with a rise in the rate of interest.
 - (b) (3) The US current account has been falling steadily since 1980. Explain carefully why this must be due either to a fall in national saving or a rise in investment.
 - (c) (2) Explain why it is that when people revise downward their assessment of the return on investment, the stock market tends to drop.
 - (d) (3) The price of a bond and the interest rate are inversely related. Explain why this is so.
 - (e) (2) What does the Federal Reserve system do to increase the money supply?
 - (f) (4) Draw the graph of the IS curve in the Standard IS-LM model. Indicate clearly the point where the IS curve hits the vertical axis and the point where it hits the horizontal axis. In your graph, be sure to indicate the values of these intercepts as a function of the exogenous variables.
 - (g) (4) Suppose t_1 is replaced by a positive number in the IS-LM model. Does this increase or decrease that amount that an increase in \bar{G} shifts the IS curve? Explain.
 - (h) (4) Explain why $q > 0$ increases the multiplier in the Keynesian Cross model.

2. (15) The Paradox of Thrift refers to the fact, in the Keynesian Cross model, that people's increased desire to save triggers a fall in output. The fall in output is so great that it exactly reverses the initial increase in the desire to save.
- (a) Explain, using the Keynesian Cross diagram, the shift from the old equilibrium to the new equilibrium when c_0 falls. Why must the fall in equilibrium output be precisely equal to what is necessary to exactly offset the initial increase in the desire to save?
 - (b) Consider a fall in c_0 the IS-LM model. Discuss, using graphs, the consequences for equilibrium output and the interest rate of a fall in c_0 . Does the fall in c_0 still trigger a fall in Y ? What happens to saving between the old and new equilibria? How and why does the result differ from what you found in a.
3. (15) Suppose there is a sudden exogenous increase in money demand.
- (a) Why does a shift up in \bar{L} capture this idea nicely?
 - (b) Why might a sudden increase in money demand occur?
 - (c) Explain the impact of the increase in money demand on the IS-LM model:
 - i. which curve shifts (explain)
 - ii. where is the new equilibrium (explain)
 - iii. describe in intuitive terms the move from the old to the new equilibrium.

4. (30) Full crowding out refers to the proposition that saving is an exogenous variable, so that when the government borrows an extra dollar, that's one less dollar available for investment. In principle there could be *no crowding out*, in which case the increase in government borrowing produces an equal increase in private saving. Or, there could be *partial crowding out*, when an increase in borrowing results in a smaller increase in saving. There could even be *negative crowding out*, in which an increase in government borrowing produces a rise in saving bigger than the increase in government borrowing itself. In this question, we consider an increase in borrowing that results from a cut in taxes from T to $T - \Delta T$, where $\Delta T > 0$.
- (a) (10) Consider the Keynesian Cross model. By how much does equilibrium Y increase with the tax cut? Indicate the increase in equilibrium income in the Keynesian Cross diagram. How much does $Y - T$ increase? By how much does planned saving, S , increase? Show your results using the relevant algebra. What sort of crowding out occurs here: full, none, partial or negative? Explain.
- (b) (10) Now consider the Standard IS-LM model. Using the IS-LM diagram, show what happens after the drop in T . What curve shifts? Where is the new equilibrium? Explain how the economy moves from the old to the new equilibrium. What sort of crowding out occurs here: full, none, partial or negative? Explain.
- (c) (10) Consider the IS-LM model with an investment accelerator. Explain why the shift in the IS curve is bigger - potentially much bigger - with $q > 0$. Explain why crowding out could actually be negative in the IS-LM model with an investment accelerator.