14.02 Principles of Macroeconomics
Spring 05
Quiz 1
Thursday March 3, 2005

7:30 pm - 9 pm

Please answer the following questions. Write your answers directly on the quiz. There are 6 True/False questions, followed by 2 long questions. The last part of the second long question is for an extra credit of 7 points, but the rest of the quiz adds up to 100 points. There is a blank page at the end of the quiz to be used for scratch paper. Good luck!

NAME: _____

MIT ID NUMBER: _____

TA: _____

CLASS TIME: _____

EMAIL: _____

(Table is for corrector use only.)

	1	2	3	4	Total
I. T/F					
II. LQ 1					
III. LQ 2					
Total					

I. True/ False (30 points)

Answer each as TRUE or FALSE (note - there is no uncertain option), providing a few sentences of explanation for your choice. Each question counts for 5 points.

1. The growth rate of real GDP is a better measure of economic growth than the growth rate of nominal GDP.

2. Consider a proportional income tax $T = tY$. Changing the proportional income tax rate will only affect the autonomous spending, but not the multiplier.

3. In equilibrium in the financial market with the presence of banks, the supply of money is a fraction (< 1) of the supply of high powered money.

4. In an open market operation where the central bank increases money supply by buying bonds, the price of bonds will fall.

5. According to the standard IS-LM framework, if investment becomes more responsive to interest rates, the equilibrium interest rate is also more responsive to a monetary expansion.

6. In the standard labor market model, the real wage is always determined by the degree of competition among firms and the marginal product of labor.

II. Long question - IS-LM (35 points)
Suppose the goods market is described as follows :

Goods Market
Goods Demand: $Z = C + I + G$
Consumption: $C = a + b\,(Y - T)$, where a and b are positive constants
Investment: $I = e - fi$, where e and f are positive constants
Government Exp.: $G = G_0$, where G_0 is a constant
Tax: $T = hY$

Assume $0 < b < 1$; $0 < h < 1$.
1. Derive the IS relation. (5 points)

Suppose the money market (with private banks) is described as follows :

Let $\frac{H^s}{P}$ be the supply of real central bank money. The overall real money demand is $\frac{M^d}{P} = uY - vi$.

Assume that people hold a fixed proportion α of their money in currency, and the rest of it in checkable deposits.

Private banks are required to hold θ of their total checkable deposits in reserve.

2. Denote the demand for real central bank money as $\frac{H^d}{P}$. Express $\frac{H^d}{P}$ in terms of parameters (α,θ,u,v), output (Y) and interest rate (i). (5 points)

3. Draw the demand and supply for real central bank money in a $(H/P, i)$ space. (5 points)

4. Derive the LM relation using the conditions for the central bank money market to be in equilibrium. Does a change in the required reserve ratio affect the sensitivity of output to interest rates along the LM curve? (5 points)

5. After several bank runs, the central bank decides to increase the required reserve ratio from θ to $\theta' > \theta$. How does this policy affect the equilibrium output and interest rate? Show your results graphically in a (Y, i) space. Explain why increasing the required reserve ratio has such an impact on the equilibrium output and interest rate. (5 points)

6. Suppose now that the government wants to increase output in the short run. Discuss the effectiveness of fiscal versus monetary policy if the overall money demand is very sensitive to interest rates; and investment is very *insensitive* to interest rates. Use a graph in your explanation. (5 points)

7. Suppose now that the government decides to decrease the tax rate h by a half. Does monetary policy become more effective now? Write a few sentences to explain. (5 points)

III. Long question - The Labor Market (35 points)

Consider an economy with the following specifics : The wage setting curve is given by $W/P = \alpha - \beta u$ (where the constant α denotes any variable whose increase would increase the real wage, and u is the unemployment rate). The production function is $Y = AN$ (where N is employed labor and A is labor productivity), and firms price at a markup of μ over marginal costs.

1. Suppose the economy is in labor market equilibrium, with an unemployment rate equal to the natural rate. It has a non-institutional civilian population of 80 million and a number unemployed (they are all looking for a job) equal to 3.2 million. Also consider the following values for the parameters : $\alpha = 1, \beta = 10/3, \mu = 20\%, A = 1$

(a) Determine the equilibrium rate of unemployment (3 points)

(b) Determine the participation rate (3 points)

(c) Determine the natural level of output (3 points)

2. For the case where $Y = AN$, with $A > 1$

(a) Write down the price setting equation. (3 points)

(b) Does the equilibrium real wage increase or decrease (relative to the case where $A = 1$)? Provide some intuition for your answer. (4 points)

(c) Does the natural rate of unemployment increase or decrease (relative to the case where $A = 1$)? Provide some intuition for your answer. (4 points)

3. For each of the following, describe what happens to the natural rate of unemployment

(a) An increase in the legislated minimum wage (5 points)

(b) A decrease in unemployment benefits (5 points)

(c) An increase in anti-trust legislation (5 points)

4. Extra credit : Any model which predicts that steady increases in productivity lead to steady decreases in the unemployment rate over time is in contradiction with the facts. There must be something wrong with the model. Discuss. (7 points)

Scratch Paper