14.02 Principles of Macroeconomics
Fall 2005

Quiz 2
Tuesday, November 8, 2005
7:30 PM – 9 PM

Please, answer the following questions. Write your answers directly on the quiz. You can achieve a total of 100 points. There are 5 short questions, followed by 2 long questions (one weighted 40/100 and one weighted 30/100 points). You should read all of the questions first. There is a blank page attached 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	Total
Short Questions			
Question 1			
Question 2			
Total			

Short Questions (30/100 points)

Please state whether the following two statements are TRUE or FALSE with a short explanation (3 or 4 lines). Each question counts 6/100 points.

1. The arbitrage law holds comparing *nominal* returns, but it does not have to hold comparing *real* returns.

2. The Phillips Curve, in all its forms, says that the rate of unemployment can only be different from the natural one if agents are surprised by inflation.

3. If a central bank were fully credible, it could always decrease inflation without any cost in terms of unemployment.

4. In the medium run, a permanent increase in the nominal money growth of, say 10%, is reflected in a 10% increase in the inflation rate and a 10% increase in the real interest rate – leaving the nominal interest rate unchanged.

5. The yield curve can never be downward sloping.

Long Question I (40/100 points)
AS/AD

Assume that the following is true about the economy:

$C = 82 + 0.1(Y - T)$
$I = 60 - 160i + 0.1Y$
$G = 20$
$T = 20$
$M^d = PY + 120 - 1000i$
$M^s = 200$

Assume the following wage setting relation:

$W = P^e(z - 20u)$ where
$z = \frac{28}{10}$ is a parameter that represents the workers' bargaining power and *u* is the unemployment rate.
The following is the price setting relation: $P = (1+\mu)W$, where $\mu = 0.25$ is the markup.

The production function is $Y = N$.

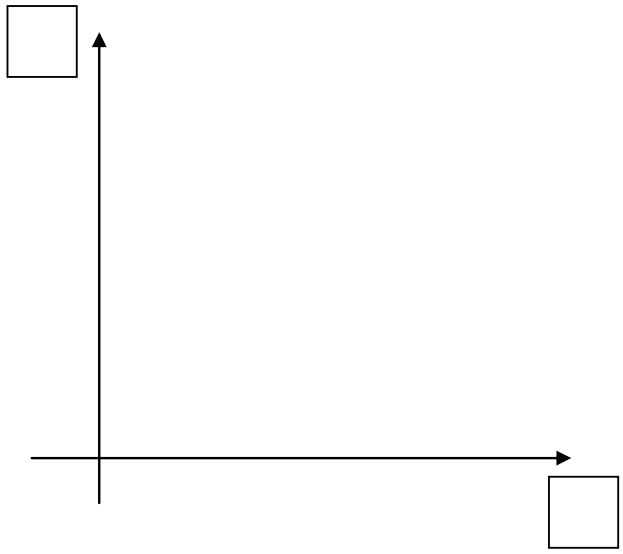
The labor force is $L = 200$.

1) Derive the equation that characterizes the AS curve. (5 points)

2) Derive the equation that characterizes the AD curve. (5 points)

3) Compute the medium run equilibrium values for Y_n (the natural level of output), u_n (the natural rate of unemployment), P, and i. (5 points)

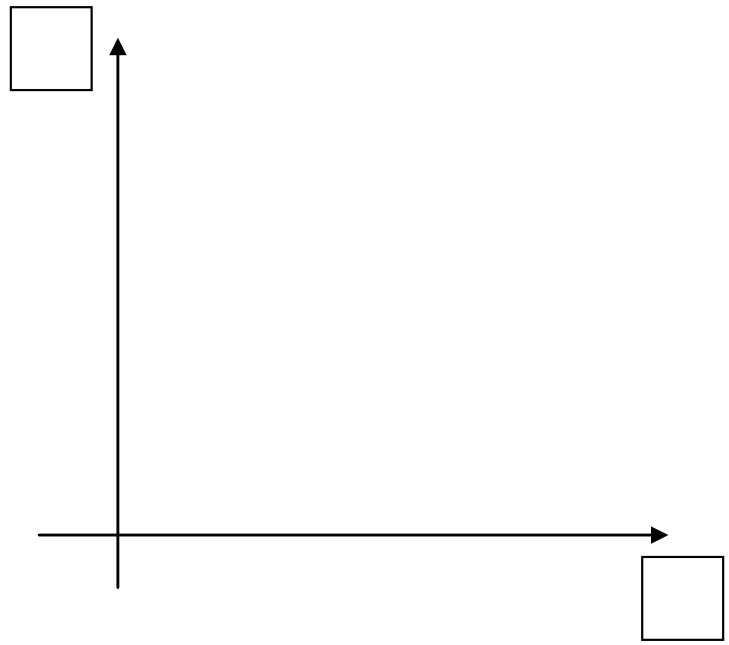
4) On a graph in the $\{P, Y\}$ space draw the AS and AD curves and their intersection, showing the values of the equilibrium points on the two axes. (Note: you do not need to compute the intercepts of the AS and AD relations.) (5 points)



Consider the effect of an increase in both G and T from 20 to 28.

5) Calculate the new medium run levels of Y_n, u_n, P, and *i*. (5 points)

6) Graph the dynamics that bring the economy to the new equilibrium. Label all curves (AS_{MR1}, AS_{SR}, AS_{MR2} and AD_{MR1}, AD_{SR}, AD_{MR2}), where *MR1* and *MR2* stand for the initial and new medium run equilibrium, respectively and *SR* stands for the short run. Label the initial and the new equilibrium with the associated values on the axes. (5 points)



7) How does the composition of GDP change compared to part 3)? (5 points)

8) Would you get the same results as in part 7) following a change in monetary, rather than fiscal policy? Explain your answer. (5 points)

Long Question II (30/100 points)
Inflation, Activity, and Nominal Money Growth

Assume that the economy is described by the following equations:

$u_t - u_{t-1} = -0.5\left(g_{yt} - \bar{g}_y\right)$ (Okun's Law)

$\pi_t - \pi_t^e = -\left(u_t - u_n\right)$ (Phillips curve)

$g_{yt} = g_{mt} - \pi_t$ (Aggregate Demand relation)

Also, assume: $\bar{g}_y = 0.05$ and $u_n = 0.05$.

HINT!!! You can solve parts 3) and 4) using reasoning and intuition even if you didn't solve parts 1) and 2) of this question.

1) Assume that at t=0 the economy is in the medium run equilibrium. What are u_0 and π_0 if we have the nominal growth rate of money $\bar{g}_m = 0.14$? (5 points)

2) Consider the case where $\pi_t^e = \pi_{t-1}$. Assume that the Central Bank is able to decrease inflation in t=1 by 2 percentage points (that is $\pi_1 = \pi_0 - 2\%$) and then keeps it fixed at that level ($\pi_2 = \pi_3 = ... = \pi_0 - 2\%$). How should the Central Bank change g_m in order to do that? Calculate the values of g_m for all the periods until the new medium run equilibrium is reached. (10 points)

3) Assume that at t=0 there is a stock traded in the stock market that promises to pay a constant real dividend D for the next three periods (t=1, t=2, and t=3), such that its real price is $Q_0 = \frac{D}{1+r_1} + \frac{D}{(1+r_1)(1+r_2)} + \frac{D}{(1+r_1)(1+r_2)(1+r_3)}$ where *r* is the real interest rate.

   At t=0 the stock market learns that the Central Bank is going to behave at t=1 as described in part 2).

   Assume that the stock market is able to perfectly forecast the future real interest rate and that in each period the real interest rate decreases by the same percentage points by which the real money growth rate increases, and vice versa. The dynamics of the real money growth are as you derived in part 2).

   Compare the value of the stock Q_0 in the old equilibrium and after the change in monetary policy. How does the expectation of the change in monetary policy at t=1 affect the share price at t=0? Does the price increase, decrease or stay the same? Explain why. (10 points)

4) Suppose that in part 2) wage-setters set $\pi_t^e = \pi_t$. How does this change your answer to part 3)? Explain. (5 points)