

## 14.02 – Fall 2001 – QUIZ 3

STOP! Please read instructions first:

- Read all questions carefully and completely before beginning the exam.
- Everything you write on this booklet will be graded. For scratch work, please use the blue book provided.
- If you make use of any simplifying assumptions, state them clearly.
- Label all of your graphs, including axes, clearly; if we can't read the graph, you will lose points on your answer.
- Show your work on all questions in order to receive partial credit.
- The quiz is worth a total of 100 points.
- No notes, calculators, or books may be used during the quiz.
- You will have 2 hours to complete the quiz. Good luck!

NAME:

TA:

SECTION/RECITATION TIME:

PART 1: True, False or Uncertain.  
(30 points)

Explain your answer completely but briefly.

- a. The natural level of output can be determined by looking only at the aggregate supply relation. (5 points)

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- b. Fiscal policy cannot affect investment in the medium run, because output always returns to its natural level. (5 points)

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- c. An increase in unemployment benefits will reduce output and raise both the level of prices and the interest rate in the short run, but will have no effect on output in the medium run. (You can use the AS-AD model we have seen in class, and assume that output is initially at its natural level). (5 points)

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- d. As long as we do not mind having high inflation, we can achieve as low a level of unemployment as we want. All we have to do is increase the demand for goods and services by using, for example, expansionary fiscal policy. (5 points)

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- e. An increase in the rate of money growth decreases the nominal interest rate. (5 points)

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- f. Capital accumulation and technological progress are the sources of sustained output per capita growth in the long run. (5 points)

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## PART 2: Investment and Monetary Policy (40 Points)

Consider the following model of the economy (we ignore the role of  $G$  and  $T$  on demand; also, to simplify the algebra, we assume that output depends on the difference between  $M$  and  $P$  rather than on their ratio):

$$\begin{aligned}\text{AD} &: Y_t = c(M_t - P_t) \\ \text{AS} &: P_t = P_t^e + d(Y_t - Y_n)\end{aligned}$$

where  $c$  and  $d$  are parameters.

- a. What is the natural level of output? If nominal money is equal to  $M_0$ , what is the initial price level? Call this initial price level  $P_0$ . (8 points).

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Suppose now that, in an effort to stimulate the economy, the Fed decides to pursue an expansionary monetary policy, and doubles the money stock:  $M_1 = 2M_0$ .

- b. Solve for the equilibrium level of output in the short run. (8 points)

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- c. What happens to investment behind the scene? Explain in words. (8 points)

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- d. Solve for the equilibrium level of output in the medium run. (8 points)

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- e. What happens to investment in the medium run? Explain in words. (8 points)

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### PART 3: Indexation of Wages (30 points)

Suppose that the Phillips Curve is given by:

$$\pi_t - \pi_t^e = 0.1 - 2u_t$$

where

$$\pi_t^e = \pi_{t-1}$$

Suppose that inflation in the year 2000 is zero. In the year 2001, the authorities decide to keep the unemployment rate at 4% percent forever.

- a. Compute the rate of inflation for years 2001, 2002, 2003 and 2004. (10 points)

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Now suppose that half the workers have indexed labor contracts. This is, the expected rate  $\pi_t^e$  is still the relevant inflation rate in determining wages for half the workers in the economy, whereas the current rate,  $\pi_t$ , replaces  $\pi_t^e$  as the relevant inflation rate in determining wages for the other half (those who have wages indexed to inflation). Instead of  $\pi_t^e$ , then, we will have  $0.5\pi_t^e + 0.5\pi_t$ .

- b. What is the new equation for the Phillips Curve? (5 points)

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- c. Repeat the exercise in (a) –now under this new assumption. (5 points)

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- d. What is the effect of indexation on the relation between  $\pi$  and  $u$ ? Explain in words. (If you wish, you can simply base your answer on the results you derived in the questions above). (10 points)

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