Professor Christiano
Economics 311, Winter 2004

Second Midterm

IMPORTANT: read the following notes

- You may not use calculators, notes, or aids of any kind.

- A total of 100 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 on the answer sheets and circle your TA there (separate pack of papers).

- YOU HAVE TO TURN IN BY 10:45am !

1. **MULTIPLE CHOICE (10 points, 2 points each)**

(a) Which is Bernanke's major explanation for the slow recovery of the labor market?

    (A) high wage demands by labor unions

    (B) increaed benefit costs to employers

    (C) strong productivity growth

    (D) trade liberalization with Canada and Mexico

(b) Assume that I does not depend on Y. In the AS-AD model, if there is an increase of G

    (A) investment will decline in the short run by more than G has increased and it will decline in the medium run by the same as G has increased

    (B) investment will decline in the short run by less than G has increased and it will decline in the medium run by the same as G has increased

    (C) investment will decline in the short run by more than G has increased and it will decline in the medium run by less than G has increased

    (D) investment will decline in the short run by the same as G has increased and it will decline in the medium run by the same as G has increased

(c) Suppose there is a monetary contraction. Which of the following is a complete list of the variables that must decrease?

    (A) consumption

    (B) consumption and investment

    (C) consumption and output

    (D) consumption, output and the interest rate

    (E) consumption, output and investment

(d) "Money is neutral" means that a change in the money supply

    (A) will not change output in the short run

    (B) will not change output in the medium run

    (C) will not change the price level in the short run

    (D) will not change the price level in the medium run

(e) Use the IS-LM model to answer this question. Suppose the economy is operating under the effects of a liquidity trap. Now suppose there is an open market purchase of bonds by the central bank. Based on this information, which of the following must occur?

    (A) the interest rate will decrease

    (B) the interest rate will not change

    (C) output will increase

    (D) the money supply will not change

    (E) none of the above

The equations of our basic model are:

$$C^d = c_0 + c_1 (Y - T) \qquad \text{consumption function}$$
$$G^d = \overline{G} \qquad \text{desired government spending}$$
$$T = \overline{T} \qquad \text{taxes}$$
$$I^d = \overline{I} - b \times i \qquad \text{desired investment}$$
$$M^d = P \times L(\underset{-}{i}, \underset{+}{Y}) \qquad \text{money demand}$$
$$W = P^e F(\underset{-}{u}, z), \ u = 1 - \tfrac{N}{L} \qquad \text{bargaining equation}$$
$$P = (1 + \mu)W, \qquad \text{price equation}$$
$$Y = N, \qquad \text{production function}$$

where N denotes employment and L is the labor force. In a 'short run' equilibrium, goods and financial markets are in equilibrium, and the equations characterizing price and wage determination are satisfied. A 'medium run' equilibrium is a short run equilibrium where, in addition, $P^e = P$. The 'natural rate of unemployment' is the level of unemployment in a medium run equilibrium. The 'natural level of output' is the level of output in a medium run equilibrium.

2. (30 points) Suppose that for some reason workers get discouraged and withdraw from the labor force, producing a fall in L (no other exogenous variable shifts in the model).

   (a) Explain what happens to the natural level of unemployment and to the natural level of output.

   (b) Suppose that the economy begins in a medium run equilibrium. In the diagram provided, draw the AD and AS curves and show how these shift with the drop in L. Indicate how to determine the horizontal distance of the shifts.

   (c) In the same diagram as for (b), indicate the medium run equilibrium before the shock occurs by the number '1'. Indicate the short run equilibrium after the shock by a '2'. Indicate the medium run equilibrium after the shock by a '3'. Indicate on the horizontal axis the value of the expected price level in the old medium run equilibrium, and the expected price level in the new medium run equilibrium.

   (d) What happens to the unemployment rate across the equilibria indicated by 1, 2, and 3. Explain carefully.

   (e) Explain what happens over time to Y/L.

   (f) Explain what happens over time to the interest rate. Illustrate your argument by referring to what happens to the IS and LM curves in the provided diagram and mark the corresponding equilibria by 1,2, and 3.

3. (30 points) Consider the effect, in the short run and the medium run, of a fall in $\overline{G}$ by $\Delta\overline{G} > 0$.

   (a) What curve shifts, AD or AS, and by how much? Explain carefully.

   (b) In the provided diagram, label the old medium run equilibrium with a '1', the new short run equilibrium with a '2' and the new medium run equilibrium by a '3'.

   (c) Show where the three equilibria in (b) appear in the provided IS-LM diagram. How far left does the IS curve shift with the drop in $\overline{G}$? Explain.

   (d) In the provided graph, draw what happens to i, C and I in the short run and in the medium run. Display a formula showing the magnitude of the medium run change in i and I, in terms of $\Delta\overline{G}$. Explain how you derived this formula.

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4. (30 points) Suppose that people suddenly expect the price level to rise, i.e., the expected price level jumps from P^e to $P^{e'}$.

(a) How does this show up in the provided AS-AD diagram? Indicate the value of $P^{e'}$ on the vertical axis. Label the old medium run equilibrium with a '1', the new short run equilibrium with a '2' and the new medium run equilibrium by a '3'. What is the relationship between the expected price level in the old medium run equilibrium and the one in the new medium run equilibrium?

(b) Explain in words, and briefly, how the economy goes from 1 to 2 to 3.

(c) Now suppose that the monetary authority does what it can to adjust the money supply immediately to ensure that output remains at its natural rate.

 1. What does this monetary authority do, when P^e jumps?

 2. In the provided diagram, show what happens to the AD and AS curves, and label the location of the new short run and medium run equilibria. What is the value of M/P across these equilibria? What happens to P/P^e across these equilibria?

 3. Is the jump in the expected price level justified by subsequent events?