May/June Examination Period 2024-25

ECN106 Macroeconomics 1 *Duration: 2 hours*

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Answer ALL questions

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Section A

Consider the outcome of an economy in the **long-run** with $N = 8000$ potential workers who may be employed or unemployed. Suppose that the aggregate production function is

$$Y = A \cdot L^{\alpha},$$

where Y is real GDP, L is the number of employed people and A aggregate productivity. Assume the initial productivity level is $A = 1$

Further suppose that the job separation rate is $s = 0.02$ and the job finding rate is $f = 0.89$. Recall the firm's marginal product of labour (MPL) is given by

$$MPL = \alpha \frac{A}{L^{1-\alpha}}$$

where α is the share of labour in the economy and equal to 0.65.

On the demand-side, suppose that the consumption and investment functions are, respectively,

$$C = \bar{C} + c(Y - \bar{T}) = 50 + 0.55(Y - \bar{T})$$
$$I = \bar{I} + i(r) = 140 - 1000r.$$

where r is the real interest rate. Assume government purchases are $\bar{G} = 120$, and taxes are $\bar{T} = 130$.

Finally, suppose that the monetary base is $B = 1200$, that the reserve ratio is $rr = 0.08$ and the currency deposit ratio is $cr = 0.6$. Inflation expectations are $\pi^e = 0.02$. Money demand is given by,

$$M^d = PY\frac{1}{23i}$$

To summarize,

$$N = 8000, \quad s = 0.02, \quad \bar{G} = 120, \quad B = 1200,$$
$$f = 0.89, \quad \bar{T} = 130, \quad rr = 0.08, \quad cr = 0.6$$

Answer all questions on the following page. Always assume that the economy is in equilibrium (in <u>all</u> markets). Round the final answer to two decimal places.

Question 1: Calculate the long-run equilibrium values of *Y, W/P, C, S, r and I*.

[16 marks]

Question 2: Calculate the long-run equilibrium values of *m*, M^S *and P*.

[10 marks]

Question 3: There is an increase in the exogenous component of consumption $\bar{C}$ to 60.

a What is the new long-run equilibrium values of *Y, W/P, C, S, r and I*?

[6 marks]

b Explain graphically the adjustment in the goods and financial markets.

[8 marks]

Question 4: The short-run equilibrium is initially at the long run level you found in Question 1, with $\bar{C} = 50$. Assume the Central Bank Taylor rule is as follows

$$R = \bar{r} + m_Y(Y - \bar{Y}) = \bar{r} + 0.005(Y - \bar{Y})$$

The government decides to increase taxes from 130 to 140. Assume $\bar{Y} = 339.42$ and $\bar{R} = 8.6\%$.

a Find the short-run equilibrium values for *Y, C, I, R and i* following the government tax shock.

[10 marks]

b Explain graphically the adjustment using the Keynesian cross and the IS-MP model.

[8 marks]

c Why is the change in output smaller than the one implied by the Keynesian multiplier?

[7 marks]

d Using the AS-AD model, explain intuitively and graphically the transition from the short run to the long run equilibrium, assuming there is no response from the monetary authority to output deviations from its target value and that $\bar{r}$ adjusts on impact with the shock.

[10 marks]

Section B

Multiple choice questions: There is always at least one correct answer but there may be more than one correct answer. Select all answers that are correct. Justify your choice of answer(s) in 1 to 2 lines.

Question 5: Which of the following are true about Money Market equilibrium in the long run?

a. An increase in Money Supply increases output.

b. An increase in Money Demand increases output.

c. Money Supply only affects prices, a phenomenon known as monetary neutrality.

d. None of the above.

[5 marks]

Question 6: Which of the following are true about output calculated via the expenditure approach?

a. Consumption of used goods is included in consumption C and therefore in output Y.

b. The pension reform affects government spending G and therefore output Y.

c. Government building a new infrastructure affects government spending G and therefore output Y.

d. A firm investing in a used machine affects investment I and therefore output Y.

[5 marks]

Question 7: Which statement(s) is(are) true about the long run aggregate demand?

a. It fluctuates with planned expenditure.

b. It fluctuates with actual expenditure.

c. It is determined by the labour market equilibrium.

d. An increase in money supply increases aggregate demand.

[5 marks]

Question 8: Which of the following is true about the money multiplier?

a. An increase in the monetary base changes the money multiplier.

b. An increase in the interest rate changes the money multiplier.

c. The currency to deposit ratio cr affects the money multiplier.

d. The reserve requirement rr affects the money multiplier.

[5 marks]

Question 9: Which of the following is true about the short run equilibrium?

a. Monetary policy cannot affect output, a phenomenon known as money neutrality.

b. An increase in government spending leads to a decrease in investment with no impact on output.

c. An increase in government spending leads to an increase in output.

d. Changes in aggregate demand can affect output.

[5 marks]

End of Paper