



May/June Examination Period 2022-23

ECN106 Macroeconomics 1

Duration: 2 hours

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Answer ALL questions

Calculators are permitted in this examination. Please state on your answer book the name and type of machine used. Complete all rough workings in the answer book and cross through any work that is not to be assessed.

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Section A

Consider the outcome of an economy in the **long-run** with $N = 12000$ potential workers who may be employed or unemployed. Suppose that the aggregate production function is

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

where Y is real GDP, L is the number of employed people and A aggregate productivity. Assume that $\bar{K} = 1$, the initial productivity level is $A = 1$

Further suppose that the job separation rate is $s = 0.05$ and the job finding rate is $f = 0.8$. 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 0.66.

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

$$C = \bar{C} + c(Y - \bar{T}) = 50 + 0.5(Y - \bar{T})$$

$$I = \bar{I} + i(r) = 200 - 1300r.$$

and that government purchases are $\bar{G} = 100$, and taxes are $\bar{T} = 150$.

Finally, suppose that monetary base is $B = 1000$, that reserve ratio is $rr = 0.1$ and the currency deposit ratio is $cr = 0.5$.

To summarize,

$$\begin{aligned} N = 12000, \quad s = 0.05, \quad \bar{G} = 100, \quad B = 1000, \\ f = 0.8, \quad \bar{T} = 150, \quad rr = 0.1, \quad cr = 0.5 \end{aligned}$$

Answer all questions on the following page. Always assume that the economy is in equilibrium (in all markets).

Question 1: Calculate the long-run equilibrium. For this, you need to find the equilibrium values of Y , W/P , C , S , r and I .

[16 marks]

Question 2: There is an increase in the marginal propensity to consume (increase in c) to 0.7.

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 3: The short-run equilibrium is initially at the long run level you found in Question 1, with $c = 0.5$. Assume the Central Bank Taylor rule is as follows

$$R = \bar{r} + m_Y(Y - \bar{Y}) = \bar{r} + 6(Y - \bar{Y})$$

Inflation expectations are $\pi^e = 0.02$. The government decides to increase spending from 100 to 150. Assume $\bar{Y} = 492$ and $\bar{r} = 2.23\%$.

a Find the short-run equilibrium values for Y , C , I , r and i following the government spending 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 graphical analysis, discuss how your previous answer would change in case:

1 $m_Y = 0$

[5 marks]

2 $m_Y \rightarrow +\infty$

[5 marks]

e 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 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 or 2 lines.

Question 4: The central bank can increase money supply using which instruments? There may be more than one answer.

- a. Increasing the reserve requirements rr .
- b. Increasing the currency deposit ratio cr .
- c. Increasing the monetary base B .
- d. Decreasing the real interest rate r .

[5 marks]

Question 5: Which of the following are true about the real interest rate r ? There may be more than one answer.

- a. In the long-run it is determined by the Central Bank.
- b. In the short-run, an increase in savings leads to a lower r .
- c. All else constant, an increase in inflation expectations reduces the real interest rate according to the Fisher equation.
- d. In the short-run, an increase in the nominal interest rate leads to a higher r .

[5 marks]

Question 6: Which one is true about long run equilibrium output $\bar{Y}$? There may be more than one answer.

- a. An increase in government spending has a positive impact on $\bar{Y}$.
- b. $\bar{Y}$ is determined by the labour market equilibrium in the long run.
- c. The Central Bank can affect $\bar{Y}$ by decreasing the nominal interest rate i .
- d. A decrease in the job separation rate leads to an increase in $\bar{Y}$.

[5 marks]

Question 7: Which of the following is true about GDP? There may be more than one answer.

- a. It is equal to the sum of total value added in the economy.
- b. It is equal to the sum of total production in the economy.
- c. Used goods are accounted for in the GDP expenditure approach.
- d. Unemployment subsidies are accounted for in the GDP income approach.

[5 marks]

Question 8: Which of the following affect the natural rate of employment in the long-run? There may be more than one answer.

- a. Job separation rate s .
- b. Job finding rate f .
- c. The real wage $\frac{W}{P}$
- d. Unemployment benefits.

[5 marks]

End of Paper