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Макроэкономика 1 — МИЭФ, 2022 midterm

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SECTION 1

A. Multiple-choice questions — 40 marks

Choose **one** correct answer. Each question is worth **8 marks**.

1

A closed economy described by the Solow model is on its balanced growth path. Technology grows at rate g , while population grows at rate n . What is the growth rate of GDP per capita?

- (a) 0
- (b) n
- (c) g
- (d) $n + g$

2

A closed economy described by the Solow model without technological progress is in the steady state. What will happen to consumption per worker in the new steady state if the marginal propensity to consume permanently decreases?

- (a) It will increase
- (b) It will decrease
- (c) There will be no change
- (d) The effect is ambiguous

3

Consider the $IS - MP$ model for a closed economy in which the central bank stabilises output according to

$$r = r^* + \mu(Y - Y^*).$$

Greater business confidence increases the autonomous component I_0 of investment demand,

$$I(r) = I_0 - br,$$

and causes the central bank to raise the real interest rate. What will be the effect on equilibrium investment in the short run?

- (a) Positive
- (b) Negative
- (c) No effect
- (d) Ambiguous

4

The central bank targets the real interest rate at r^* , so investment demand is exogenous:

$$I(r^*) = I_0 - br^*.$$

The government keeps expenditures at G_0 and permanently raises the proportional tax rate t when access to debt financing becomes limited. How will tax receipts tY change in the short run?

- (a) tY will increase
- (b) tY will decrease
- (c) tY will not change
- (d) The change is ambiguous

5

Sight deposits are five times public cash holdings and twenty times excess reserves voluntarily held by commercial banks. How will a decrease in the required-reserve ratio from 15% to 5% affect the money multiplier?

- (a) It will remain equal to 3
- (b) It will remain equal to 4
- (c) It will decrease from 4 to 3
- (d) It will increase from 3 to 4

SECTION 2

C. Problem — 60 marks

Consider a closed economy where private consumption depends on disposable income, investment depends on the real interest rate r , and government spending G is financed only by proportional net taxes tY . Goods-market equilibrium is

$$Y = C_0 + c_1(Y - tY) + I_0 - br + G,$$

where C_0 and I_0 are autonomous consumption and investment, c_1 is the marginal propensity to consume out of current disposable income, and t is the effective proportional net-tax rate.

Short-run aggregate supply is

$$\pi = \pi^e - \lambda(Y - Y_n),$$

where π is current inflation, π^e is expected inflation and $Y - Y_n$ is the output gap.

The central bank chooses the nominal interest rate according to

$$i = i^* + \vartheta(\pi - \pi^*),$$

where π^* is the inflation target.

(a) (10 marks) What does parameter b mean, what does it depend on and how is it related to the effectiveness of the monetary-policy transmission channel? Limit your answer to three or four sentences.

First consider the special monetary-policy case in which the central bank targets the real interest rate at r^* .

(b) (10 marks) Derive the general real-interest-rate policy rule, the rrr curve. What value of ϑ corresponds to real-interest-rate targeting? Explain the economic intuition in two or three sentences.

(c) (10 marks) Illustrate the short-run effect of a higher tax rate t in the $IS - MP$ diagram. What happens to private saving in the short run? Explain intuitively in two or three sentences.

Now consider strict inflation targeting, with inflation expectations anchored at π^* when output equals potential.

(d) (10 marks) Illustrate the effects of a higher marginal propensity to consume on the real interest rate, output and inflation using the four-quadrant $IS - rr - 45^\circ - AD - AS$ diagram. Ensure that all diagrams are connected and properly labelled. Explain in two or three sentences.

Finally, consider the general case of flexible inflation targeting.

(e) (10 marks) Derive the AD schedule using the rr rule obtained in (b). Suppose parameter b falls. Illustrate the initial shock in the $AD - AS$ diagram. What policy should the central bank pursue to eliminate completely the effect of lower b on output and inflation and return the economy to its initial long-run equilibrium (Y_n, π^*) , leaving π^e unchanged? Illustrate the response in the same diagram and explain the adjustment in two or three sentences.

(f) (10 marks) How does the answer to (e) change if borrowing constraints reduce both b and long-run capital accumulation? Illustrate the long-run effects on output and inflation using the four-quadrant $IS - rr - 45^\circ - AD - AS$ diagram. Explain the role of inflation expectations. How are π^e and π^* related in the new equilibrium, and what does this imply for central-bank credibility?