Макроэкономика 1 — МИЭФ, 2023 midterm

МИЭФ | Макроэкономика 1 | 2023 | midterm

SECTION 1

A. Multiple-choice questions — Variant 1 — 40 marks

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

1

A closed economy described by the Solow model is on its balanced growth path. Technology and population grow at equal rates, $g = n$. What is the growth rate of GDP per capita?

- (a) 0
- (b) n
- (c) n^2
- (d) $2n$

2

Consider the $IS - MP$ model for a closed economy with proportional taxes, where the central bank pursues output stabilisation according to

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

Investment demand has no induced component:

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

What will be the effect of a balanced-budget fiscal **expansion** on equilibrium private saving in the short run?

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

3

In a closed mixed economy, the central bank keeps the real interest rate constant at $r = r^*$. Profits constitute a share ϑ of national income and are taxed at the same proportional rate t as labour income. Privately owned firms fully reinvest their after-tax profits. State-owned firms distribute their after-tax profits as dividends to the government, which uses them to finance purchases. Consider a decrease in the share of profits earned by private firms. What will be the effect on the autonomous-expenditure multiplier in the short run?

- (a) The multiplier will decrease
- (b) The multiplier will not change
- (c) The multiplier will increase
- (d) The change will be ambiguous

4

The Taylor rule embodies the principle that monetary policy should adjust the nominal interest rate in response to **higher** inflation by:

- (a) decreasing it exactly one-for-one;
- (b) increasing it more than one-for-one;
- (c) decreasing it more than one-for-one;
- (d) increasing it exactly one-for-one.

5

Which of the following is **not** treated by the Bank of Russia as part of the asset-price channel?

- (a) Welfare channel
- (b) Interest-rate channel
- (c) Narrow credit channel
- (d) Balance-sheet channel

SECTION 2

A. Multiple-choice questions — Variant 2 — 40 marks

1

A closed economy described by the Solow model is on its balanced growth path. Technology and population grow at equal rates, $g = n$. What is the growth rate of GDP per capita?

- (a) 0
- (b) n^2
- (c) n
- (d) $2n$

2

Under the same $IS - MP$ assumptions as in Variant 1, what will be the effect of a balanced-budget fiscal **contraction** on equilibrium private saving in the short run?

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

3

In the mixed-economy setting described in Variant 1, what will be the effect of a decrease in the share of profits earned by private firms on the autonomous-expenditure multiplier in the short run?

- (a) The multiplier will decrease
- (b) The multiplier will increase
- (c) The multiplier will not change

- (d) The change will be ambiguous

4

The Taylor rule embodies the principle that monetary policy should adjust the nominal interest rate in response to **lower** inflation by:

- (a) decreasing it exactly one-for-one;
- (b) increasing it more than one-for-one;
- (c) decreasing it more than one-for-one;
- (d) increasing it exactly one-for-one.

5

Which of the following is **not** treated by the Bank of Russia as part of the asset-price channel?

- (a) Welfare channel
- (b) Narrow credit channel
- (c) Interest-rate channel
- (d) Balance-sheet channel

SECTION 3

C. Problem — 60 marks

Consider a closed economy with constant population $\bar{L}$ and decentralised income redistribution between workers and non-workers. Workers do not pay taxes and save a share φ of total income. Their non-saved income is spent on consumption and lump-sum donations Ψ to non-workers. The number of workers equals the number of non-workers. Non-workers use the donations solely for consumption and do not save.

Private investment demand is

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

where $b > 0$. The central bank sets the real interest rate according to the flexible-inflation-targeting rule

$$r = r^* + \alpha(\pi - \pi^*),$$

where π^* is the long-run inflation target. Short-run aggregate supply is

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

where $\lambda > 0$ and $Y - Y_n$ is the output gap.

Initially, the output gap is zero, $r^* = 0$ and the economy is at $\pi_0 = \pi^*$. Greater uncertainty about the future permanently doubles the share φ of workers' income that is saved.

(a) (10 marks) Derive the algebraic expression for the aggregate-demand schedule in $\pi(Y)$ space. What are the nominal and real interest rates in the initial equilibrium?

(b) (10 marks) Illustrate in the four-quadrant $IS - rr - 45^\circ - AD - LRAS$ diagram the initial long-run equilibrium and the immediate effects of greater thriftiness on the positions of the IS and AD schedules.

(c) (10 marks) Immediately after the shock, people have static inflation expectations:

$$\pi_0 = \pi_0^e = \pi_1^e.$$

Later, they switch to myopic forecasts and adjust expectations in line with observed inflation:

$$\pi_1 = \pi_2^e.$$

Illustrate in the four-quadrant $IS - rr - 45^\circ - AD - AS$ diagram the effects of greater thriftiness on the real interest rate, inflation and output when people switch from static to myopic expectations. No verbal explanation is required if all schedules and points are perfectly labelled.

(d) (10 marks) Now assume rational expectations and fully flexible nominal wages. The central bank promises to keep inflation at π^*, but agents may not trust it. When they do trust it, expectations are forward-looking and anchored at π^*. When they do not, people expect no change in monetary policy after the initial shock. Illustrate in the four-quadrant $IS - rr - 45^\circ - AD - SAS$ diagram the difference between non-anchored and anchored expectations in their effects on the real interest rate, inflation and output. Carefully label all curves and explain both adjustment processes.

(e) (10 marks) Finally, consider the very-long-run consequences of greater thriftiness for capital accumulation and GDP growth. Production is

$$Y = \sqrt{K}\, L,$$

where K is physical capital and $L = \bar{L}/2$ is the fixed number of employed workers. The initial saving rate φ equals the depreciation rate δ. Find algebraic solutions for steady-state GDP per worker and GDP per capita in the Solow model.

(f) (10 marks) Plot the transition path of the real interest rate to the new steady state after the saving rate doubles to

$$\varphi' = 2\delta.$$

Is this real-interest-rate dynamics consistent with strict inflation targeting in (d)?