

HE1002 Macroeconomics I

Final Practice Examination 4 – Problems

Academic Year 2025/2026, Semester 1

Quantitative Research Society @NTU

November 14, 2025

Examination Instructions

Time Allowed: 120 minutes (2 hours)

Total Marks: 100

Answer Requirements:

There is a total of 4 questions. Answer all the questions.

- **Question 1** consists of 15 calculation questions. 2 marks each, total 30 marks. Please state the formula used and show your working.
- **Question 2** consists of 10 short-answer questions. 3 marks each, total 30 marks. Each answer is expected to be around 4 to 5 lines (or 2 to 3 sentences) long.
- **Question 3** consists of 10 true or false questions. 3 marks each, total 30 marks. Please clearly explain your reasoning for both true and false statements. Each answer is expected to be around 4 to 5 lines (or 2 to 3 sentences) long.
- **Question 4** consists of 2 diagram-related questions. 5 marks each, total 10 marks.

Additional Instructions:

- There are NO MCQ questions.
- Bring a calculator.
- It is a closed-book examination.
- Write all answers in the answer booklet provided.
- Show all working for calculations.

Question 1: Calculations (30 marks)

Answer all 15 questions. Each question carries 2 marks. Show all formulas and working.

1.1 [Adapted from Tutorial 1, Question 4 – modification: adapted – changes: numerical values scaled]

Given: $C = \$18.5$ billion, $I = \$4.2$ billion, $G = \$6.1$ billion, $NX = -\$0.8$ billion.

Calculate total GDP.

1.2 [Adapted from Tutorial 1, Question 7 – modification: adapted – changes: all numerical values changed]

An economy has: Consumption = \$175,000, Investment = \$60,000, Government purchases = \$82,000, Exports = \$38,000, Imports = \$25,000.

Calculate GDP using the expenditure approach.

1.3 [Adapted from Tutorial 2, Question 3 – modification: adapted – changes: years shifted, costs scaled]

The cost of a market basket in 2024 was \$25,000. In 2025, the cost of the same basket was \$27,000. Using 2024 as the base year (CPI = 100), calculate:

- (a) The CPI in 2025
- (b) The inflation rate from 2024 to 2025

1.4 [Adapted from Tutorial 3, Question 2 – modification: adapted – changes: population scaled, employment ratio modified]

An economy has: Working-age population = 150,000, Labor force = 75,000, Employed = 60,000, Unemployed = 15,000.

Calculate:

- (a) Unemployment rate
- (b) Labor force participation rate

1.5 [Adapted from Tutorial 4, Question 3 – modification: adapted – changes: growth rate increased]

A country has real GDP per capita growing at 4% per year. Using the Rule of 70, calculate how many years it will take for income per capita to double.

1.6 [Adapted from Tutorial 4, Question 1 – modification: adapted – changes: all rates modified]

Country data: Nominal GDP growth = 9%, Inflation = 3.5%, Population growth = 1.2%. Calculate real GDP per capita growth rate.

1.7 [Adapted from Tutorial 5, Question 15 – modification: adapted – changes: MPC changed, shock magnitude increased]

Given MPC = 0.85, calculate:

- (a) The expenditure multiplier
- (b) The change in equilibrium output if autonomous expenditure increases by \$600 million

1.8 [Adapted from Tutorial 5, Question 12 – modification: adapted – changes: all parameter values modified]

An economy has: Autonomous consumption = \$900, MPC = 0.80, Investment = \$1,200, Government spending = \$700, Net exports = \$500, Taxes = \$600.

Calculate equilibrium output (Y^*).

1.9 [Adapted from Tutorial 7, Question 10 – modification: adapted – changes: MPC increased]

MPC = 0.80. Calculate:

- (a) Government spending multiplier
- (b) Tax multiplier

1.10 [Adapted from Tutorial 7, Question 11 – modification: adapted – changes: values scaled up]

Government spending = \$400 billion, Tax revenue = \$350 billion.

Calculate the budget deficit or surplus.

1.11 [Adapted from Tutorial 8, Question 19 – modification: adapted – changes: all GDP components modified]

An economy has: GDP = \$600B, Consumption = \$420B, Government spending = \$160B, Investment = \$100B, Taxes = \$140B.

Calculate:

- (a) Public saving
- (b) Private saving

1.12 [Adapted from Tutorial 9, Question 7 – modification: adapted – changes: reserve ratio increased, deposit scaled]

Reserve ratio = 0.125, Initial deposit = \$3,200.

Calculate total money supply created through the money multiplier.

1.13 [Adapted from Tutorial 10, Question 16 – modification: adapted – changes: all growth rates modified]

Money supply grows at 8.5%, velocity is constant, real GDP grows at 2.5%.

Using the Quantity Theory of Money, calculate the inflation rate.

1.14 [Adapted from Tutorial 12, Question 1 – modification: adapted – changes: trade values scaled]

U.S. exports = \$280 billion, U.S. imports = \$360 billion.

Calculate the balance of trade and identify whether it is a surplus or deficit.

1.15 [Adapted from Tutorial 12, Question 18 – modification: adapted – changes: prices and exchange rate modified]

A Big Mac costs €4.80 in France and US\$4.50 in the United States. The actual exchange rate is US\$1.10 per €1.

Calculate:

- (a) The PPP-implied exchange rate
- (b) Whether the euro is overvalued or undervalued

Question 2: Short Answer (30 marks)

Answer all 10 questions. Each question carries 3 marks. Each answer should be 4-5 lines (2-3 sentences).

2.1 [Adapted from Tutorial 1, Question 3 – modification: adapted – changes: context changed to government grants]

Does government spending on education grants to students count as part of GDP? Explain why or why not.

2.2 [Adapted from Tutorial 2, Question 5 – modification: adapted – changes: product changed from laptops to smartphones]

Why do smartphone prices require hedonic quality adjustment when measuring inflation in the CPI?

2.3 [Adapted from Tutorial 3, Question 7 – modification: adapted – changes: examples changed]

Distinguish between cyclical unemployment and structural unemployment. Provide one example of each.

2.4 [Adapted from Tutorial 4, Question 4 – modification: adapted – changes: context changed to medical technology]

A pharmaceutical company develops a breakthrough drug that cures a major disease. Which component of productivity does this improve, and why does it promote economic growth?

2.5 [Adapted from Tutorial 5, Question 3 – modification: adapted – changes: comparison reframed]

Explain why tax cuts have a smaller multiplier effect than government purchases of goods and services.

2.6 [Adapted from Tutorial 6, Question 8 – modification: adapted – changes: question asks about slopes instead of difference]

Why does the short-run aggregate supply curve have a positive slope while the long-run aggregate supply curve is vertical?

2.7 [Adapted from Tutorial 7, Question 8 – modification: adapted – changes: asked for mechanism not just examples]

Explain the economic mechanism through which automatic stabilizers reduce economic fluctuations. Use progressive taxation as your example.

2.8 [Adapted from Tutorial 8, Question 4 – modification: adapted – changes: asks for flow vs stock distinction]

In macroeconomics, is "saving" a stock or a flow variable? What about "wealth"? Explain the relationship between them.

2.9 [Adapted from Tutorial 9, Question 1 – modification: adapted – changes: asks for ranking by liquidity]

Rank the three functions of money by their importance for a modern economy, and explain your ranking.

2.10 [Adapted from Tutorial 10, Question 12 – modification: adapted – changes: asks for policy implication]

Explain the neutrality of money in the long run and discuss one policy implication of this concept.

Question 3: True or False (30 marks)

Answer all 10 questions. Each question carries 3 marks. State whether each statement is TRUE or FALSE and explain your reasoning in 4-5 lines (2-3 sentences).

3.1 [Adapted from Tutorial 1, Question 17 – modification: adapted – changes: T/F polarity reversed]

Statement: A parent who quits a paid job to stay home and care for their child does not cause GDP to change, because the same childcare service is being provided.

3.2 [Adapted from Tutorial 3, Question 1c – modification: adapted – changes: T/F polarity reversed, worker type changed]

Statement: A worker who is actively seeking employment but hasn't found a job yet is classified as "not in the labor force" by the Bureau of Labor Statistics.

3.3 [Adapted from Tutorial 4, Question 8a – modification: adapted – changes: shares modified, polarity reversed]

Statement: Country A's labor share is 65%, Country B's labor share is 55%, and labor is growing at 3% in both countries. All else equal, Country A has a higher growth rate of output than Country B.

3.4 [Adapted from Tutorial 5, Question 2 – modification: adapted – changes: T/F polarity reversed]

Statement: Consumption spending is more volatile than investment spending over the business cycle.

3.5 [Adapted from Tutorial 6, Question 2 – modification: adapted – changes: tax increase instead of cut]

Statement: A tax increase that decreases disposable income will shift the aggregate demand curve to the left.

3.6 [Adapted from Tutorial 7, Question 9 – modification: adapted – changes: asks about validity assumption]

Statement: Ricardian equivalence holds in reality for most consumers, meaning debt-financed tax cuts have almost no effect on consumption.

3.7 [Adapted from Tutorial 8, Question 17 – modification: adapted – changes: T/F polarity reversed to test inefficiency]

Statement: If financial markets have significant information asymmetries and transaction costs, skilled investors can consistently earn above-average returns through careful research and analysis.

3.8 [Adapted from Tutorial 9, Question 6 – modification: adapted – changes: asks about velocity of money difference]

Statement: M1 has a higher velocity of money than M2 because M1 includes more liquid assets that turn over more frequently.

3.9 [Adapted from Tutorial 10, Question 22 – modification: adapted – changes: asks about expectation effects]

Statement: If workers and firms fully anticipate inflation, the short-run Phillips curve becomes vertical like the long-run Phillips curve.

3.10 [Adapted from Tutorial 12, Question 17 – modification: adapted – changes: asks about fiscal policy instead]

Statement: Fiscal policy is more effective under a floating exchange rate regime than under a fixed exchange rate regime.

Question 4: Diagrams (10 marks)

Answer both questions. Each question carries 5 marks.

4.1 [Adapted from Tutorial 6, Question 17 – modification: adapted – changes: shock type changed to positive demand, policy response added] (5 marks)

An economy is initially in long-run equilibrium. Government significantly increases infrastructure spending, creating a positive demand shock.

- (a) Draw an AD-AS diagram showing the initial long-run equilibrium.
- (b) Show the immediate short-run effect of the fiscal expansion on the diagram.
- (c) Describe what happens to output, unemployment, and the price level in the short run.
- (d) Explain how the economy adjusts back to long-run equilibrium through the self-correcting mechanism (without further policy intervention).

4.2 [Adapted from Tutorial 8, Question 6 & Question 21 – modification: adapted – changes: shock reversed (investment increase instead of government deficit)] (5 marks)

- (a) Draw a loanable funds market diagram showing the initial equilibrium interest rate and quantity of funds.
- (b) Technological innovation increases expected returns on investment, shifting investment demand to the right. Show the effect on your diagram.
- (c) Explain what happens to the equilibrium interest rate and quantity of loanable funds.
- (d) How does this differ from the case where government borrowing increases demand? Would "crowding out" occur in this scenario?

END OF EXAMINATION

Total: 100 marks

Time: 120 minutes

All questions adapted from HE1002 Tutorial Problem Sheets 1–12