

## ECON3123 Problem Set 1 (Due on Sep 21, 2025)

Name: \_\_\_\_\_

Student ID: \_\_\_\_\_

1. An economy produces three goods: cars, computers, and oranges. Quantities and prices per unit for years 2009 and 2010 are as follows:

	2009		2010	
	Quantity	Price	Quantity	Price
Cars	10	\$2000	12	\$3000
Computers	4	\$1000	6	\$500
Oranges	1000	\$1	1000	\$1

- a. What is nominal GDP in 2009 and in 2010? By what percentage does nominal GDP change from 2009 to 2010?
- b. Construct real GDP for years 2009 and 2010 by using the average price of each good over the two years. By what percentage does real GDP change from 2009 to 2010?

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- c. What is the GDP deflator in 2009 and 2010? Using the GDP deflator, what is the rate of inflation from 2009 to 2010?

### 2. Investment and income

Suppose the economy is characterized by the following behavioral equations:

$$C = c_0 + c_1 Y_D$$

$$Y_D = Y - T$$

$$I = b_0 + b_1 Y$$

Government spending and taxes are constant. All the parameters are positive.

- a. Solve for equilibrium output.

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- b. What is the value of the multiplier? How does the relation between investment and output affect the value of the multiplier? For the multiplier to be positive, what condition must  $(c_1 + b_1)$  satisfy? Explain your answers.

(Cont'd Q2)

- c. What would happen if  $(c_1 + b_1) > 1$ ? (Trick question. Think about what happens in each round of spending).

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- d. Suppose that the parameter  $b_0$ , sometimes called business confidence, increases. How will equilibrium output be affected? Will investment change by more or less than the change in  $b_0$ ? Why? What will happen to national saving?

### 3. The paradox of saving revisited

You should be able to complete this question without doing any algebra. Although you may find making a diagram helpful for part a. For this problem, you do not need to calculate the magnitudes of changes in economic variables - only the direction of change.

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- a. Consider the economy described in Problem 2. Suppose that consumers decide to consume less (and therefore to save more) for any given amount of disposable income. Specifically, assume that consumer confidence ( $c_0$ ) falls. What will happen to output?
- b. As a result of the effect on output you determined in part a. what will happen to investment? What will happen to public saving? What will happen to private saving? Explain. (Hint: Consider the saving-equals-investment characterization of equilibrium.) What is the effect on consumption?

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(Cont'd Q3)

- c. Suppose that consumers had decided to increase consumption expenditure, so that  $c_0$  had increased. What would have been the effect on output, investment, and private saving in this case? Explain. What would have been the effect on consumption?

### 4. Money and the banking system

Consider a monetary system that includes simple banks and assume the following:

- i. The public holds no currency.
- ii. The ratio of reserves to deposits is 0.1.
- iii. The demand for money is given by  $M_d = \$Y (0.8 - 4i)$

Initially, the monetary base is \$100 billion, and nominal income is \$5 trillion.

- a. What is the demand for central bank money?

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b. Find the equilibrium interest rate by setting the demand for central bank money equal to the supply of central bank money.

c. What is the overall supply of money? Is it equal to the overall demand for money at the interest rate you found in part (b)?

d. What is the effect on the interest rate if central bank money is increased to \$300 billion?

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e. If the overall money supply increases to \$3,000 billion. What will be the effect on  $i$ ?  
[Hint: Use what you discovered in part (c).]